The Year 2000 Issue

In 1996, the U. S. House of Representatives began hearings on an issue, otherwise known as the Year 2000 software problem. This problem refers to computers' potential inability to correctly recognize dates beginning with January 1, 2000. It is caused by computer programs that use two-digit numbers to represent a calendar year, such as "98" for 1998. If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some systems or equipment to malfunction. A major challenge of the Year 2000 or "Y2K" issue is that dates are everywhere in computer systems and software.

The Nuclear Regulatory Commission pursued a comprehensive program for dealing with the Y2K problem. Two aspects of the NRC's Y2K program were to ensure that:

1. NRC's computer systems supporting the agency would function properly, and
2. those licensed by the NRC, including utilities operating nuclear power plants, would identify and rectify any Y2K problems with their computer systems before January 1, 2000.

In addition to regulatory oversight of its licensees, the NRC supported the activities of the President's Council on Year 2000 Conversion and was a member of the Council's working groups dealing with energy and electric power, health care and emergency management. The NRC is also a member of the U.S. Government's Chief Information Officers Council Committee on Year 2000.

Additional information is available on the following NRC Year 2000 activities:

- **Nuclear Power Plant Computer Systems**
  - **Reports from U.S. Nuclear Power Plants During the Y2K Transition**
- **Fuel Facilities and Other Nuclear Material Users**
  - **Fuel Facility Final Y2K Status Report**
- **NRC Computer Systems**
- **NRC Year 2000 Contingency Planning**
  - **July 14 Tabletop Exercise and Lessons Learned**
  - **October 15 Contingency Planning Exercise and Lessons Learned**
  - **Year 2000 Early Warning System (YEWS) Frequently Asked Questions**

- **NRC Frequently Asked Questions**
- **NRC References and Year 2000 Links**

RECENT POSTINGS

02/11/2000 - NRC Response to Leap Day Problem

01/13/2000 - Fuel Facility Final Y2K Status Report

01/12/2000 - Reports from U.S. Nuclear Power Plants During the Y2K Transition

01/01/2000 - Press Release 00-004, *All Nuclear Facilities in The United States Transition Safely Through Y2K Rollover*

01/01/2000 - Press Release 00-003, *All Nuclear Facilities in Mountain Time Zone Transition Safely Through The Y2K Rollover*

01/01/2000 - Press Release 00-002, *All Nuclear Facilities in The Midwest Transition Safely Through The Y2K Rollover*

01/01/2000 - Press Release 00-001, *All Nuclear Facilities in Eastern United States Transition Safely Through Y2K Rollover*

12/30/1999 - Press Release II-99-058, *NRC Region II to Monitor Nuclear Plants in The Southeast During Y2K Transition*

12/28/1999 - Press Release I-99-105, *NRC Region I to Monitor Northeast Plants During Y2K Transition*

12/23/1999 - Note to Editors 99-271, *NRC Staffing for Media Assistance During Y2K Transition*

12/23/1999 - Press Release 99-268, *NRC Finds No Outstanding Y2K Problems at Nuclear Plants Undergoing Decommissioning*

12/17/1999 - Information Notice 99-32, *The Effect of the Year 2000 Issue on Medical Licensees*

12/01/1999 - NRC Regulatory Issue Summary 99-05, *Implementing Procedure for Power Reactor Notices of Enforcement Discretion (NOEDs) Processed During the Y2K Transition*

December 1999 - Monthly Y2K Status Report to the Commission by the NRC Executive Director for Operations

11/15/1999 - Letter from Chairman Meserve to Senators Bennett and Dodd on Y2K Issues

11/08/1999 - Press Release 99-240, *NRC Confirms That All Nuclear Power Plants Are Fully Y2K-ready*

November 1999 - Monthly Y2K Status Report to the Commission by the NRC Executive Director for Operations

November 1999 - Quarterly Y2K Status Report to OMB on NRC Y2K Efforts

10/19/1999 - Press Release 99-220, *NRC Conducts Full-scale Emergency Preparedness Exercise in Preparation for Y2K*

October 1999 - Monthly Y2K Status Report to the Commission by the NRC Executive Director for

Operations

09/28/1999 - Press Release 99-207, *NRC Sends Letters to Utilities to Follow up Y2K Readiness at Nuclear Power Plants*

09/13/1999 - Revision to NRC Policy for Regulatory Actions for Nuclear Power Plants That Have Not Completed Y2K Readiness Activities by July 1, 1999 [available in HTML or PDF format]

09/07/1999 - Press Release 99-191, *NRC Issues Report Confirming No Y2K Problems Affecting Safety Systems of Nuclear Power Plants - Updates Y2K Readiness Status*

09/07/1999 - NUREG-1706, *Year 2000 Readiness in U.S. Nuclear Power Plants*

09/02/1999 - Press Release 99-187, *NRC to Meet with NEI to Discuss Nuclear Industry's Y2K Activities*

09/01/1999 - Year 2000 Early Warning System (YEWS) Frequently Asked Questions

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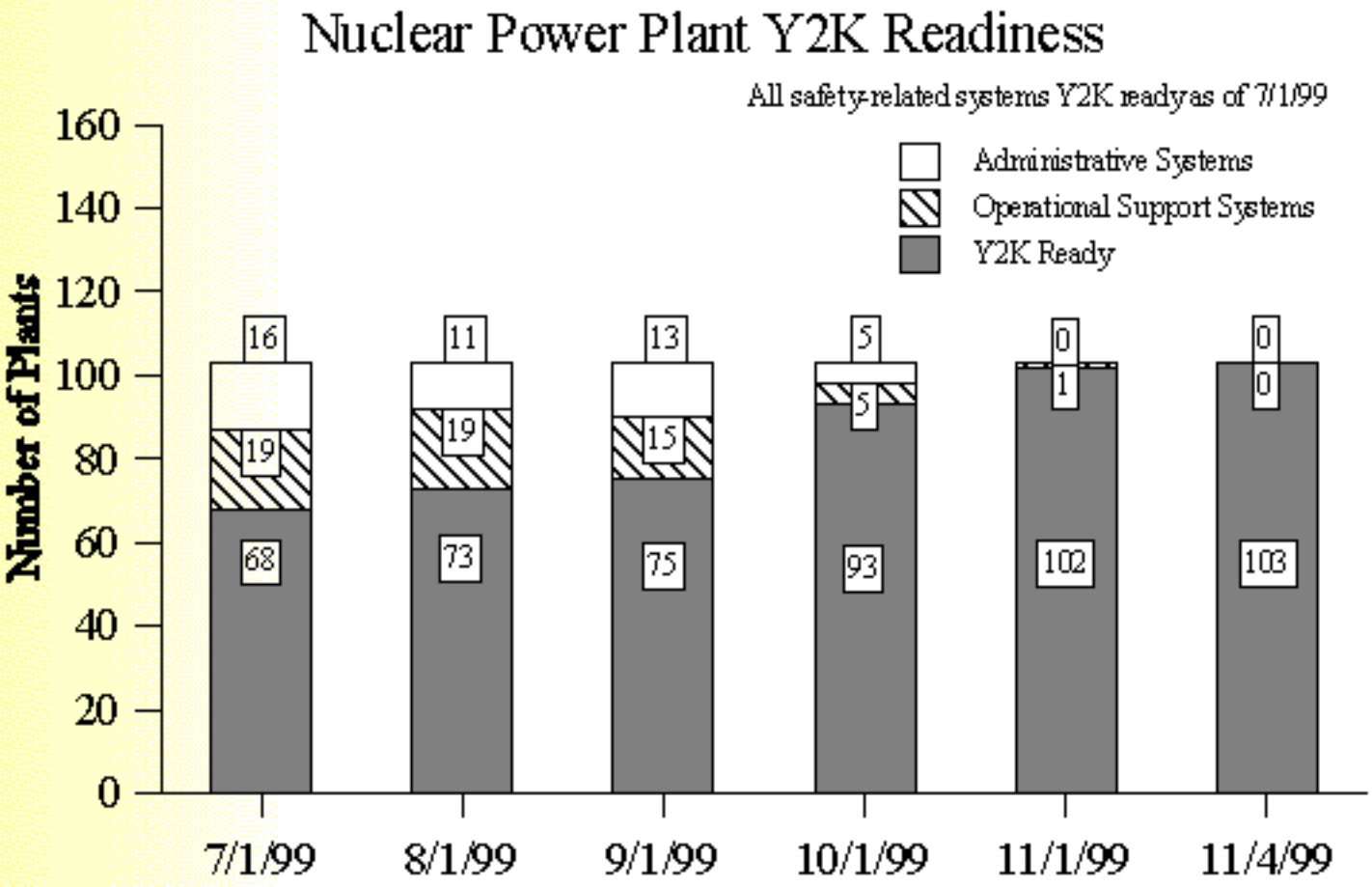
Last updated by NRCWEB on 15 February 2000

Y2K and Nuclear Reactors

CURRENT STATUS

As of November 4, 1999, the NRC received Y2K readiness status reports from licensees indicating that all 103 nuclear power plants are Y2K ready-that is, all plant systems involved with safety, power generation, and plant support are now ready to roll over into the year 2000 without computer problems. The following chart illustrates plant readiness.



PREVIOUS ACTIVITY

Since 1996, the NRC has worked with nuclear power plant licensees and the Nuclear Energy Institute (NEI), an industry organization, to assure plant systems are "Y2K ready" before the year 2000 (Y2K). To ensure that potential Y2K issues are identified and corrected, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996; Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," on May 11, 1998; and GL

98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," on January 14, 1999. IN 96-70 informed all licensees of the potential problems that nuclear facility computer systems and software might encounter during the transition to the new century. In GL 98-01, reference is made to Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," which describes an approach that all licensees have agreed to utilize in addressing the Y2K issues at their facilities. This guidance document (NEI/NUSMG 97-07) came as a result of a joint effort between NEI and NUSMG. In GL 98-01, the NRC accepted the NEI/NUSMG 97-07 guidance as an appropriate program for nuclear power plant readiness and required that all operating U.S. nuclear power plant licensees submit written responses regarding their facility-specific Y2K readiness by July 1, 1999. Licensees that were not ready were to submit their schedule for completing their Y2K activities. Supplement 1 to GL 98-01 expanded the scope of the reporting requirements to include the systems that are necessary for continued plant operation and that are not covered by the terms and conditions of the plant's license and NRC regulations.

By July 1, 1999, licensees for all 103 operating nuclear power plants reported the status of their Y2K readiness to the NRC. Regarding NRC's highest priority-the uninterrupted performance of plant safety systems-all nuclear power plants reported that their efforts were complete and that no remaining Y2K-related problems existed that could directly affect the performance of safety systems or the capability for safe shutdown (no remaining Y2K-related problems directly affecting performance of safety systems). Sixty-eight of these plants had also completed the next order of priority as of July 1, stating that all of their computer systems that support plant operation were "Y2K ready." The remaining 35 plants reported that, to be fully Y2K ready, they still had additional work to complete on a few non-safety computer systems or devices. Typically, the remaining Y2K work was awaiting a scheduled plant outage or the delivery of a replacement component. In each case, the licensees with work remaining submitted schedules for completing that work. Final reviews were performed at the 35 plants, as well as at Cooper Nuclear Station. Cooper received a final review because, after having reported being Y2K ready on July 1, it discovered a potential Y2K issue that required further resolution.

One of a number of initiatives undertaken by the NRC staff to verify and assess the effectiveness of licensee Y2K readiness programs was the conduct of the following 12 sample audits of licensee Y2K readiness programs:

DATE	PLANT	LOCATION
September 1998	Monticello	Minnesota
	Seabrook	New Hampshire
October 1998	Brunswick	North Carolina
	Hope Creek	New Jersey
	Davis Besse	Ohio
November 1998	Wolf Creek	Kansas
	Watts Bar	Tennessee
	Limerick	Pennsylvania
December 1998	Waterford	Louisiana
January 1999	North Anna	Virginia
	Braidwood	Illinois

WNP-2 Washington State

The NRC staff determined that this approach was an appropriate means of oversight of licensee Y2K readiness efforts because all licensees had committed to the nuclear power industry's Y2K readiness guidance (NEI/NUSMG 97-07) in their first response to NRC GL 98-01 and because the NRC staff had not found any Y2K problems in safety-related actuation systems. The sample of 12 licensees included large utilities, such as Commonwealth Edison and Tennessee Valley Authority, as well as small single-unit licensees, such as North Atlantic Energy (Seabrook) and Wolf Creek Nuclear Operating Corporation. Because licensee Y2K programs are corporate-wide, many of the NRC staff audits encompassed more than a single nuclear power plant site because many utilities own more than one nuclear power plant. In all, 42 of 103 operating nuclear power plant units were associated with the Y2K readiness program audits of 12 utilities. The NRC staff selected a variety of types of plants of different ages and locations in this sample in order to obtain the necessary assurance that nuclear power industry Y2K readiness programs are being effectively implemented and that licensees would be on schedule to meet the readiness target date of July 1, 1999, established in GL 98-01. In late January 1999, the NRC staff completed the 12 audits. On the basis of the audit findings, the staff concluded that the audited licensees were in the process of effectively addressing Y2K issues and were undertaking the actions necessary to achieve Y2K readiness in accordance with the GL 98-01 target date. These findings are consistent with those reported by the Department of Energy in a report prepared by the North American Electric Reliability Council on the status of Y2K readiness of the electric power grid.

In an effort to verify and assess the effectiveness of licensee contingency planning, in May and June 1999, NRC audit teams conducted additional comprehensive audits focused on the area of Y2K contingency planning at the following six sites:

Diablo Canyon 1 & 2	Duane Arnold
Indian Point 2	Oconee 1, 2 & 3
Palo Verde 1, 2 & 3	Turkey Point 3 & 4

The auditors reviewed internal facility risks, external risks, individual component/system contingency planning, and integrated contingency planning against industry guidelines of NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." As indicated in our audit reports, all six of these plants are acceptably implementing the staff-approved industry guidelines.

In addition to the NRC staff activities previously mentioned, regional NRC inspectors reviewed plant-specific Y2K program implementation and contingency activities at all nuclear power plant facilities. The inspectors used guidance (Temporary Instruction [TI] 2515/141) prepared by the NRC headquarters staff that conducted the 12 sample audits and the 6 contingency planning audits. On the basis of the reviews, the staff found that licensees were implementing Y2K programs in accordance with staff-approved industry guidelines.

In September 1999, the NRC issued NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," to present the results of the NRC-conducted onsite reviews of licensee Y2K programs at the 103 nuclear power plants, additional staff assessment of followup reviews of 14 plants, and updated information relating to plant-specific reviews.

After receiving the July readiness reports and schedules, the NRC monitored progress at those plants that

still had work remaining to independently verify the completion of the remaining items, including Y2K contingency plans that specify procedures for dealing with unexpected events. As stated in NRC Press Release No. 99-168, the staff developed guidance for appropriate regulatory actions to be taken for those facilities that were not Y2K ready by July 1, 1999. As stated in a later press release (No. 99-207) dated September 28, 1999, the NRC sent letters to those utilities with nuclear power plants that were scheduled to be Y2K ready after September 30, 1999, to verify the status of readiness and the dates when plants will be fully Y2K ready. (As noted above, all of these plants are now Y2K ready.)

Since September 1998, the staff has provided periodic status reports to the Commission and the public (via the NRC website) describing its efforts in this area and the progress of nuclear power plant licensees on addressing the Y2K issue. The following status reports were provided:

December 1999	June 1999
November 1999	May 1999
October 1999	April 1999
September 1999	January 1999
August 1999	October 1998
July 1999	September 1998

NRC will continue to oversee the Y2K issue relating to nuclear power plants for the rest of this year and beyond. We believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond, and we do not believe that significant plant-specific action directed by the NRC to address possible Y2K problems is likely to be needed. The NRC remains committed to its oversight of the nuclear power plant licensee Y2K readiness efforts in order to ensure safe operation of these facilities.

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The Year 2000 Issue

NRC Computer Systems

The Year 2000 problem potentially affects the NRC in the following two areas of information systems development or use:

1. Systems developed by NRC or its contractors to support the agency; and
2. Commercial off-the-shelf hardware and software for minicomputer, microcomputer, and other agency applications such as keycard access to NRC offices

The NRC has adopted a strategy, in accordance with the Office of Management and Budget (OMB) guidelines and schedule, to assess its systems and decide which ones need to be changed, replaced, or discarded. Those systems requiring changes will be changed, tested and validated to correct the Y2K problem. Details are provided in NRC's status reports to OMB:

- NRC Y2K Status Report for February 1999
- NRC Y2K Status Report for November 1998
- NRC Y2K Status Report for August 1998
- NRC Y2K Status Report for May 1998
- NRC Y2K Status Report for February 1998
- NRC Y2K Status Report for November 1997
- NRC Y2K Status Report for August 1997

The NRC completed an inventory of all its automated information systems and commercial software that the agency owns or shares with other agencies. These systems have been categorized as: (a) mission-critical, (b) business-essential, or (c) non-critical. NRC's seven mission-critical systems are:

Sealed Source and Device Nationwide Registry
General License Database
Licensing Tracking System
Agency Computer Network
Emergency Telecommunications System
Operations Center Information Management System
Emergency Response Data System

Renovations of all of NRC's mission-critical systems have been completed. In addition to these systems, the NRC has over sixty business-essential systems, nearly two thirds of which have been repaired.

Renovation efforts also cover the agency's collection of commercial hardware and software.

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Y2K and Nuclear Materials

For materials licensees and fuel cycle facilities, NRC has taken a number of actions (see Appendix C of SECY 97-213) to ensure that the Y2K computer problem will be either eliminated or minimized. These actions included:

- Issuing Information Notices (IN 96-70, IN 97-61, IN 98-30, IN 99-18, IN 99-20, and IN 99-32)
- Interviewing Materials Licensees and Fuel Cycle Facilities
- Publishing Articles in Industry Publications
- Contacting Materials Licensees by Inspector Followup
- Inspecting Fuel Cycle Facilities
- Issuing Generic Letter (Generic Letter 98-03)

From September 1997 through December 1997, an NRC Y2K team visited a cross-section of materials licensees and fuel cycle facilities and conducted Y2K interviews. Before the visit, a letter and questionnaire were sent to each licensee or facility. A similar set of questions was published in the *Health Physics Society Newsletter* for use by other licensees and facilities. Several telephone interviews with materials licensees were also conducted. The following licensees and facilities were interviewed:

Site Visits with Materials Licensees and Fuel Cycle Facilities

- BWX Technologies (Fuel Cycle Facility)
- Cogema Mining (Uranium Extraction)
- Georgetown University (Broad Scope and Medical)
- Mallinckrodt Medical Inc. (Radiopharmaceutical Manufacturer)
- National Institute of Standards and Technology (NIST) (Research and Development)
- U.S. Enrichment Corporation (Gaseous Diffusion Plants)

Site Visit with Agreement State Licensee

- Sterigenics North Carolina (Large Irradiators)

Telephone Interviews with Device Manufacturers and Distributors

- Ohmart Humbult Scientific, Inc. (Gauge Manufacturer)
- Seaman Nuclear Corp. (Gauge Manufacturer)
- Troxler Electronics (Gauge Manufacturer)
- General Nucleonics (Gauge Manufacturer)
- PECO Control Corp. (Gauge Manufacturer)
- LFE Industrial Corp. (Gauge Manufacturer)
- Electa (Gamma Knife Distributor)

- Theratronics (Teletherapy Device Manufacturer)

During each interview, the licensee or facility indicated that they were aware of the Y2K issue and were in various stages of implementing their Year 2000 Readiness Program. Electa and Theratronics indicated that early versions of their treatment planning systems have Y2K problems and upgrades for the systems were available. However, treatment planning systems are regulated by the U.S. Food and Drug Administration (FDA) not the NRC. For materials licensees, no Y2K issues for NRC regulated material were identified. For fuel cycle facilities, a database was identified that had a Y2K problem. The facility indicated that they would convert to a Y2K compliant database as part of their Y2K Readiness Program.

Materials Licensees

In addition to the above site visits and telephone interviews, NRC is continuing to monitor several listservers, manufacturer websites, news articles, Congressional reports, and Presidents' Y2K Council reports for Y2K issues that may affect Materials Licensees. Materials Licensees Inspectors are making Y2K inquiries during routine inspections. To date, only treatment planning systems, dose calibrators, and a tote position display for an irradiator have been found to have a Y2K problem. Treatment planning systems and dose calibrators are regulated by the FDA not the NRC. NRC has informed the FDA of all treatment planning systems and dose calibrators that Materials Licensees have found to have Y2K problems. Upgrades for these treatment planning systems and dose calibrators are available from manufacturers. Materials Inspectors have indicated that licensees are aware of these upgrades and that the licensees will complete the upgrade before the end of 1999. The tote position display is not a safety system. Further, this system is a one-of-a-kind modification made by the licensee. The licensee was authorized by NRC to make the modifications and is updating the display system. Although no generic Y2K issues for NRC regulated material used by Materials Licensees have been identified, Materials Licensees need to continue implementation of their Y2K Readiness Programs.

Fuel Cycle Facilities

Between September 1997 and October 1998, Fuel Cycle Facilities were asked Y2K questions during other inspections. Based on these Y2K inspections, the facilities were aware of the Y2K problem and were adequately addressing Y2K issues.

In June 1998, the NRC issued Generic Letter 98-03, which requested written confirmation by December 31, 1998, from Fuel Cycle Facilities that their computer systems were Y2K Ready and that they can operate safely before and after January 1, 2000. The Generic Letter also requested that if a facility was not Y2K Ready by December 31, 1998, a status report and schedule for remaining work would be sent to the NRC by July 1, 1999.

Each Fuel Cycle Facility responded to the Generic Letter and stated that they have implemented a Y2K Readiness Program. No facility stated that they were Y2K Ready by December 31, 1998. As of December 28, 1999, all of the ten major fuel cycle facilities are Y2K ready. There have been no identified risk-significant Y2K concerns for Fuel Cycle Facilities.

NRC conducted a risk-informed, performance-based examination of Portsmouth Gaseous Diffusion Plant’s Year 2000 Readiness Program in August 1999 and Paducah Gaseous Diffusion Plant’s Year 2000 Readiness Program in September of 1999. The inspectors concluded that the Y2K program of each facility had ensured that the actions taken were effective in resolving the Y2K problem and were in compliance with the terms and conditions of their certificate and NRC regulations. Each Y2K readiness

program had adequately addressed the following elements which were identified in Generic Letter No. 98-03: (1) management planning; (2) implementation; (3) quality assurance; (4) regulatory considerations; and (5) documentation.

All of the major fuel cycle facilities, with the exception of the gaseous diffusion plants (GDPs), have informed NMSS that they will only be performing low-risk, low-safety-significant activities during the Y2K transition and have plans for a controlled startup to normal operations after the Y2K transition.

Year 2000 Links

The International Atomic Energy Agency website provides Y2K information for nuclear safety, waste management, medical facilities, and safeguards/physical protection.

The FDA has placed reports of Y2K compliant & non-compliant medical on its website. The reports are organized by manufacturer. The site will be updated to provide more useful compliance information.

The Small Business Administration website provides Y2K help for small business. The site includes Y2K materials, Y2K activities, and links to other sites.

The Health Care Financing Administration has placed Y2K information for health care claim repayments for Medicare, Medicaid, and Child Health Insurance Programs on its website. The site also includes the Y2K status of health care facilities, Y2K activities, and Y2K help fro health care facilities.

The Department of Veterans Affairs website provides Y2K information and contingency planning for hospitals and the status of the VA Y2K efforts.

The NIST Y2K webpage includes Y2K test programs for Small Business, free software, Y2K standards, Y2K compliance and testing, Y2K hotlines, Y2K slide shows.

At the NIST website for small businesses, Year 2000 help , The Conversion 2000: Y2K JumpStart Kit for jump-starting a Year 2000 project is available. Also, action planning, assessment, and remediation project planning workshops are available.

The General Accounting Office has placed Y2K reports on assessment, testing, and contingency planning on its website.

The Institution of Electrical Engineers Y2K website provides information on embedded software. The site explains the use of risk management techniques.

The UK Year 2000 Website provides Y2K Information on software compliance. The reports are organized by manufacturer.

Rx2000 website is devoted to Y2K medical issues. The site has a pay section and a free section. Information found in the free section includes provider preparedness model and comparator, Rx2000 listserver and discussion forum, health care Y2K articles and publications, Rx2000 downloadable presentations, links, health care Y2K self help materials.

This page of the Radiation and Health Physics website provides links to radiation detection device

manufacturers and dosimetry companies.

This page of the intraVision website provides links to Oncology/Radiology commercial sites.

The Nuclear Energy Institute provides nuclear industry Y2K readiness information.

The American Hospital Association conducted a survey of hospital Y2K readiness status. The results of the survey can found at the American Hospital Association's website.

At the American Medical Association webpage, Y2K information for the medical community can be found.

> The U.S. Nuclear Regulatory Commission makes no claims of the accuracy in the information provided at these websites. The list of sites is provided for use by licensees and the public as a possible source of Y2K information.

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Year 2000 Contingency Plan

The NRC has been working with nuclear industry organizations and licensees since 1996 to address the Year 2000 (Y2K) problem. On the basis of audits and inspections of nuclear power plant, fuel cycle facility, and materials licensee Y2K programs to date, we are confident that our licensees will be Y2K ready by December 31, 1999, and that the Y2K transition will not affect the continued safe operation of our licensed facilities.

However, because of the nature of the Y2K issue, it is not possible to be 100-percent certain that all potential problems will be corrected. For this reason, the staff established a task force in September 1998 to develop a contingency plan for ensuring that public health and safety and the environment will continue to be protected, if unforeseen Y2K problems occur.

The staff provided the Commission with a draft of *NRC Contingency Plan for the Year 2000 Issue in the Nuclear Industry* (COMSECY 98-036) in November 1998. The contingency plan presented a reasonably conservative planning scenario for the Y2K transition and anticipated NRC staff actions to be taken in response to potential Y2K problems. The staff sought and received Commission approval to solicit public comment on the draft contingency plan. Public and industry comments were received and have been incorporated (by SECY-99-134) in the attached revision of

NRC Contingency Plan for the Year 2000 Issue in the Nuclear Industry
[Adobe Acrobat (1,173KB) or Corel WordPerfect (2,758KB) format]

The majority of the comments received on the contingency plan agree with the general scope and direction taken by the staff. However, we recognize the need for further development of the planning details and operational testing of the plan.

On February 19, 1999, a staff requirements memorandum (SRM) was issued on COMSECY-98-036. The SRM provided direction to the staff in three areas: (1) it required the staff to develop and run tabletop exercises and drills modeling potential Y2K scenarios, (2) it required the staff to evaluate and make a recommendation, following stakeholder input, on whether enforcement discretion would be preferable to the use of 10 CFR 50.54(x) in allowing licensees to deviate from license conditions or technical specifications arising from Year 2000 complications that would otherwise require plant shutdown, and (3) it directed the staff to expedite the purchase and deployment of mobile satellite communication equipment at each nuclear power plant site in advance of the Y2K transition.

The revised plan includes an updated evaluation of potential Y2K issues for all types of NRC licensees, with particular emphasis on external interfaces, such as the electric grid and telecommunications infrastructures. As described in the Y2K contingency plan, there is growing confidence that the electric grid and telecommunications infrastructures will remain operable during the Y2K transition. Consequently, the staff believes that the original planning assumptions developed in the draft Y2K

contingency plan (e.g., only localized telecommunications and electric power outages) are appropriate and sufficiently conservative for planning purposes. Furthermore, the planning assumptions with regard to the electric power and telecommunications infrastructure are consistent with the latest assessment by the President's Council on the Year 2000 Conversion, dated August 5, 1999 and the August 3, 1999, North American Electric Reliability Council Y2K status report.

On the basis of the planning assumptions, the staff has prepared a Y2K contingency plan that contains three major facets: incident response, information sharing, and regulatory response.

The incident response facet of the plan describes steps the staff will take in the unlikely but possible event that a Y2K problem would result in a safety-significant event at a nuclear power plant (NPP) or gaseous diffusion plant (GDP), such as a loss of offsite power. As part of the information sharing facet of the plan, a small team of specialists will staff the headquarters Operations Center at noon on December 31, 1999, to monitor, evaluate, and communicate any Y2K problems at foreign reactors that have potential safety implications for domestic reactor licensees. This team would also be available to respond to any potential Y2K problems caused by embedded chips that have a date stamp based on an earlier time zone. Approximately 2 hours before midnight (EST) on December 31, 1999, the headquarters Operations Center will be staffed by a multidisciplinary Y2K response team, headed by the Director of Incident Response Operations. In addition to headquarters staff, the Y2K response team will include resident or regional staff stationed at each NPP and GDP site and a small number of staff at the Incident Response Centers in each region. The NRC Regional IV office in Arlington, Texas, will be prepared to assume the functions of headquarters if an unanticipated Y2K problem results in the unavailability of the headquarters Operations Center. This Y2K response team will be prepared to respond to an event related directly or indirectly to a Y2K problem and would utilize time zone differences to share relevant safety information with those licensees that have not yet experienced the transition.

In support of the regulatory response facet of the plan, the Y2K response team will be prepared to process enforcement discretion requests related to a Y2K problem, particularly in situations in which failure to do so could have an adverse effect on electric grid stability. The staff plans to separately seek Commission approval on guidance to nuclear power plant licensees on the use of enforcement discretion in situations involving Y2K problems. These guidelines may permit continued plant operation in cases where a Y2K problem may impact compliance with a license requirement but not result in a safety concern.

The revised plan also describes steps the staff is taking to ensure that communications with the nuclear power plant and gaseous diffusion plant sites will be available in the unlikely event of a widespread telephone network outage. Also discussed are the steps the staff is taking to ensure that back-up fuel supplies will be available for the emergency diesel generator for the headquarters Operations Center.

This contingency plan specifically addresses plans for the Y2K transition (i.e., December 31, 1999, through January 1, 2000). For the times outside of the Y2K transition, including February 29, 2000, our review indicates that the potential for a serious event associated with Y2K-related issues is extremely low and carries low attendant risks to public health and safety and the environment. The staff intends to respond to events outside the Y2K transition period by utilizing its normal emergency response posture, which includes around-the-clock staffing of the Operations Center by qualified engineers to receive reports of any events and to initiate the agency's incident response plan.

On Wednesday, July 14, 1999, the NRC sponsored a Y2K Tabletop and Tabletop Exercise at the Doubletree Hotel in Rockville, Maryland. The exercise was conducted to prepare for the Y2K transition period, with the main focus of sharing information regarding potential consequences of a Y2K initiated event and its impact on the public. Participants from the Federal Emergency Management Agency (FEMA), the National Communications System (NCS), the State of Maryland, St. Mary's and Calvert counties, and Baltimore Gas and Electric Company (Calvert Cliffs Power Plant), as well as regional and headquarters staff from the NRC, were represented at the exercise.

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Frequently Asked Questions About Y2K Problems

1. **What is the status of nuclear power plants with regard to Y2K readiness?**

   Nuclear power plants are at various stages of assessing and remediating systems, components and equipment with Y2K problems using a program based on guidance developed by the Nuclear Energy Institute (NEI)--an industry organization--and acceptable to the Nuclear Regulatory Commission (NRC). Based on sample audits of 12 plants completed in January, the NRC did not identify any issues that would preclude nuclear power plants from achieving Y2K readiness before January 1, 2000. More information will be available on the status of Y2K readiness at nuclear power plants following NRC review of Y2K program activities at all 103 plants (scheduled to begin in April and to be completed by the end of June) and review of the July 1 responses from all licensees to Generic Letter 98-01.

   No Y2K problems have been identified that directly impact the proper functioning of safety systems in nuclear power plants. Most plants have protection systems that are analog rather than digital. Because Y2K concerns are associated with digital systems, analog reactor protection system functions are not impacted by the Y2K problem. Errors such as incorrect dates in printouts, logs or displays have been identified in digital devices, but the errors do not affect the **function** of safety-related devices or systems. Most Y2K problems being remediated are in balance-of-plant systems such as security systems and plant monitoring systems which support day-to-day plant operation but have no direct function necessary for reactor safety.

   All licensees are required to have contingency plans to cope with unanticipated problems should they arise during the Y2K critical roll-over dates. Licensees have made extensive use of NEI's guidance for developing their contingency plans which are also being reviewed by the NRC as part of the Y2K program review at all 103 operating plants. Licensees must confirm to the NRC by July 1 that they have developed these plans.

2. **What is the NRC doing to ensure all operating nuclear power plants are Y2K ready before the Year 2000?**

   NRC regional staff are reviewing Y2K activities at **all 103** nuclear power plants between April and June 30. During this same time, there also will be an in-depth review of contingency planning efforts at six licensees, different from those in the initial 12 audits. Results of all reviews will be made publicly available and posted on the NRC Y2K Website.

   The NRC is committed to doing what is necessary in its oversight of nuclear power plant readiness efforts for these facilities to safely operate through January 1, 2000 and beyond. As such, it has

adopted a proactive approach working with nuclear power plant licensees (owners/operators) to achieve Y2K readiness.

In response to NRC's request (Generic Letter 98-01), all licensees of operating nuclear power plants notified NRC that they are pursuing Y2K assessment and remediation in line with guidance developed by the Nuclear Energy Institute (NEI). By late January, the NRC completed 12 sample audits at plants, confirming that licensees are taking effective measures to identify and correct Y2K problems at their facilities and are on schedule for their plants to be Y2K ready before the end of the year. Results of these audits are available on the NRC Y2K Website.

By July 1, all licensees must affirm to NRC that their facilities are Y2K ready. For any plant not ready, the licensee must provide a status and schedule of the remaining tasks to be performed in order for the plant to be Y2K ready before January 1, 2000. According to industry sources, there may be as many as 20 plants that are not Y2K ready by July 1. Based on the review of information provided by those not ready, the NRC will take appropriate action such as additional audits, onsite reviews, inspections, or meetings. Sufficient time is available for the NRC to make any necessary decision on plant operation on January 1, 2000.

3. **Could Y2K problems experienced by a nuclear power plant result in a large release of radiation or otherwise compromise safety of public health and safety?**

   A large release of radiation is highly unlikely. Nuclear power plants are designed and built with multiple backup systems to assure plant safety. In addition, the plant containment--a large, concrete and steel-reinforced structure--is designed to contain the radiation in the highly unlikely event that there was an accident. For example, while the 1979 Three Mile Island accident resulted in a partial meltdown of nuclear fuel in the reactor core and high radiation levels inside the containment building, members of the community received very small radiation exposures (i.e, about 1/100th of the dose they would receive annually from natural background sources).

   Nonetheless, all licensees are required to be Y2K ready and to develop contingency plans to deal specifically with potential Y2K problems. Plant operators are trained extensively to deal with potential emergencies and time-tested plans are in place to deal with a plant accident whether or not it is triggered by a Y2K problem.

4. **If a Y2K problem occurs at a nuclear power plant, can it be shut down safely?**

   Yes. In a majority of plants, the systems required to safely shut down a plant are analog, not digital, thus not susceptible to Y2K problems. Where digital devices are used in safety systems, they are either not susceptible to the Y2K problem or are Y2K compliant. If necessary, a nuclear power plant can be shut down manually.

5. **How long does it take to shut down a nuclear power plant safely?**

   Under normal conditions, it takes several hours to safely shut down a nuclear power plant by reducing reactor power gradually. However, in an emergency, the reactor can be shut down safely

within seconds either automatically or manually. The reactor will shut down automatically by the reactor protection system upon sensing an unusual condition. However, the operator always has the capability to manually shut down the reactor using the reactor protection system. To reduce the residual heat in the reactor following shutdown, cooling takes several days.

6. **Will NRC shut down nuclear power plants that are not Y2K ready?**

   The NRC requires that all nuclear power plants report their Y2K readiness by July 1. Should the NRC identify a situation where the Y2K issue results in a plant being in non-compliance with its license or NRC regulations, appropriate action will be taken. By September, the NRC will determine the need for issuing orders to nuclear power plant licensees to address Y2K readiness issues including, if warranted, shutdown of a plant.

   At this time, we believe all licensees will be able to operate their plants safely during the transition from 1999 to 2000, and do not believe significant plant-specific action directed by NRC is likely to be needed.

7. **What is the difference between Y2K ready and Y2K compliant?**

   Y2K compliant means that all digital systems and computers will accurately process date/time data during the transition from 1999 to 2000. This may require system repairs or replacements. Y2K ready means that while there may be some digital systems or computers that are known or expected to fail during the transition, appropriate compensating or alternative actions have been taken such that the functions provided by the systems will be carried out. For example, if a recorder fails and prints the wrong date, it can be identified and corrected manually by writing the correct date over the wrong one.

8. **What is the difference between safety related and non-safety related?**

   Safety related systems are designed to make certain that a nuclear power plant is able to shut down safely and to stay in a safe shutdown condition. Safety related systems are also used to prevent or mitigate the consequences of potential accidents.

   Non-safety related systems are important to plant operation but not necessarily related to safety. Examples of non-safety related systems include radiation monitoring systems, plant simulators, and communication systems.

   Industry guidance in NEI/NUSMG 97-07 does not differentiate between safety related and non-safety systems, except when assigning priorities for remediation. In general, licensee programs deal with non-safety related components in the same manner as safety related components, although safety related components may receive a higher priority for remediation. The staff's 12 plant reviews indicated licensees are addressing Y2K readiness in a comprehensive manner.

9. **Are non-safety related systems included in the NRC reviews of nuclear power plants?**

   The inspector site reviews focus on licensee Y2K readiness programs. Although the reviews will not focus on individual systems, licensee Y2K readiness programs consider both safety related and non-safety related systems.

   Any non-safety related components that are digital in nature or that use digital embedded systems might be Y2K vulnerable. In accordance with the guidance contained in NEI/NUSMG 97-07, each licensee has developed a Y2K project data base; that is, a list of which plant systems are digital and therefore Y2K vulnerable. Non-safety related components are part of this Y2K project data base at each plant. Development of this data base is one of the more critical items as shown in NEI/NUSMG 97-07, the framework document in general use by utilities to determine their Y2K readiness.

10. **How will loss of offsite power or disturbances on the electrical grid affect nuclear power plants during the Y2K transition period?**

    Nuclear plants are required to have multiple connections to the electrical grid so that the failure of one connection will not affect the others. Depending on the design of the plant, it may shut down automatically if all offsite power is lost. Each plant has redundant and independent onsite power supplies which, by design, can provide power to safely shut down the reactor and keep it in a safe condition.

11. **Are blackouts expected? If so, for how long do you estimate the public would be without electricity?**

    According to the North American Electric Reliability Council and the President's Council on Year 2000 Conversion, **massive national disruptions in electric power are unlikely**. Some minor local outages may occur; however, the electric power industry is prepared to meet this challenge because of its experience in dealing with the many naturally occurring events such as storms and floods. As such, it is advisable to prepare as you would for a snow storm where electricity could be out for a couple of days. The latest NERC report is available at: www.nerc.com.

12. **If diesel generators at nuclear power plants are needed to provide backup power, how reliable are they and for how long can they operate?**

    Diesel generators are tested regularly and are required to have at least a 7-day supply of fuel oil on which to operate. Many plants are planning to take precautionary measures to have additional fuel oil onsite as part of their site specific Y2K contingency planning efforts. We also know from experience that diesel generators will reliably supply back-up power for extended periods of time. For example, the diesel generators effectively provided power to the Turkey Point nuclear power plant in Florida for several days during hurricane Andrew in August 1992.

13. **What are the effects of solar activity on Y2K sensitive equipment and how are potential**

problems are being dealt with.

Solar activity is similar to electromagnetic or radio frequency interference in the effect it has on equipment. The problems it causes are purely hardware related. Y2K is a software problem. There is no relationship between them, other than if they occur at the same time, there are two failures, not one, to deal with. Solar activity (flares) have the potential to affect the electrical grid, which in turn may affect the operation of plant equipment.

The effects of geomagnetic storms include: disruption of satellite communications; disruption of radio transmissions (due to ionosphere changes); and geomagnetically induced currents in electric power grids--particularly in high voltage step-up transformers such as power plant main transformers. Unlike lightning strikes, which produce very short duration voltage and current changes, geomagnetically induced currents can last for hours. Such extended-duration induced currents can cause increased transformer heating, insulation breakdown and transformer failure. In addition, the voltage fluctuations can cause relays to trip and portions of the grid to collapse. During the last solar cycle maximum (1989), a severe geomagnetic storm caused the collapse of the Quebec hydroelectric system.

Solar storms induce disturbances in electrical conductors. The amount of disturbance is dependent on the length of the conductor. Since the electrical grid consists of very long conductors, the grid may become noisy or unstable. The effect on the grid is difficult to predict, but these disturbances are reduced in shorter conductors and are not expected to have a significant direct impact on local plant equipment.

At the peak of the last solar cycle, NRC issued Information Notice 90-42, "Failure of Electrical Power Equipment Due to Solar Magnetic Disturbances". Since that time, a number of ground current detectors have been installed in the Northeast as part of the Electric Power Research Institute's Sunburst Project. In addition, many utility companies now have emergency operating procedures for solar storms.

14. **What contingency plans are there for dealing with Y2K problems that may arise at nuclear power plants? Does the NRC plan to conduct any emergency exercises or drills to test Y2K contingency plans?**

Each licensee must develop a contingency plan to deal effectively with any unforeseen Y2K problem. A contingency plan helps ensure that sufficient resources are considered and help guide decision- making should something happen unexpectedly. The Nuclear Energy Institute has developed guidance to assist licensees develop their plans. The Y2K contingency plan is in addition to existing contingency plans that deal with a myriad of potential plant problems and include State and local response organization involvement. All Y2K contingency plans are scheduled to be completed by July 1, 1999, and training of personnel completed before the end of the year.

The NRC has its own Y2K contingency plan, which will be tested in October during an exercise with licensees and foreign regulators. The plan is available on the NRC Y2K Website. As part of the plan, on December 31, the NRC plans to fully staff its Emergency Operations Center at headquarters in Rockville, Maryland and a backup response center near Dallas, Texas to deal

quickly with any Y2K problems that may occur with licensees. Also, the NRC expects to have an NRC resident inspector at each plant site during the Y2K transition period.

15. **What measures have NRC and nuclear power plants adopted to deal with the loss of communications? Can a plant continue to operate safely and reliably if the communication links fail?**

A nuclear power plant can continue to operate safely and reliably if the communication links fail. These communication systems are not safety systems and are not directly related to operation at the plant.

There is an Emergency Telecommunications System (ETS) at all commercial nuclear power plants which provides information to NRC from plant control rooms, technical support centers, and emergency operations facilities. This system is carried on dedicated lines to the Federal Telecommunications System (FTS) 2000 network which is separate from the public switched telephone network. The General Services Administration has advised the NRC that the FTS 2000 network will be Y2K ready by July 1999.

In addition to the ETS, communication can be provided via the public switched network. According to the National Communications Systems (NCS) Manager, testing for all of the major telephone vendors and networks is in progress and major portions of the public switched network will be Y2K ready by mid-1999. We are also working closely with NCS to ensure that the switches in the small local telephone companies near our licensed facilities are being upgraded as necessary.

Although the NRC is becoming increasingly confident that the telecommunications systems relied on to communicate with nuclear power plants will be operable during and after the Y2K transition, some prudent measures are being taken to ensure that communications will be possible even in the unlikely event of a widespread telecommunications outage that affects both the FTS 2000 system and the public switched network. Specifically, NRC will be part of the National Telecommunication Coordination Network (NTCN), which is a dedicated network, independent of the public switched network, for coordination of emergency telecommunication issues.

In addition, as part of the NRC Y2K Contingency Plan, the NRC is planning to provide one portable satellite telecommunications unit at each nuclear power plant. This channel of communication will be sufficient to notify NRC of any events that may occur at a plant. If normal telephone access to the NRC Operations Center is lost, a plant could still communicate with the NRC via either direct satellite communication or via satellite link relayed through the NTCN.

16. **What is the status of Y2K readiness of nuclear power plants in other countries?**

The NRC maintains a general awareness of other countries' nuclear Y2K programs. However, the International Atomic Energy Agency (IAEA) is coordinating Y2K information about nuclear power plants worldwide and is the principal source of information on the status of Y2K compliance as it relates to nuclear safety in other countries. Information on the IAEA's Y2K activities can be found on their website at: www.iaea.org/worldatom/program/y2k/.

Version dated 21 June 1999

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Y2K References and Links

Nuclear Regulatory Commission Y2K Information

- Commission Meetings and Papers
- Congressional Testimony and Public Speeches
- Contingency Planning
- Federal Register Notices
- Frequently Asked Questions
- Generic Correspondence
- Nuclear Reactors
- Nuclear Materials
- Press Releases
- Status Reports
- Year 2000 Points-of-Contact

Federal Government Y2K Information

- U.S. Government Gateway for Y2K Information

Nuclear Industry Y2K Information

- Nuclear Energy Institute
- Nuclear Utilities Software Management Group
- Nuclear Information and Resource Service

NUCLEAR REGULATORY COMMISSION

COMMISSION MEETINGS AND PAPERS

07/02/1999 - Commission Policy Paper SECY-99-173 on Denial of Petitions for Rulemaking Submitted by the Nuclear Information and Resource Service (also see Staff Requirements Memorandum for SECY-99-173)

06/22/1999 - Commission Policy Paper SECY-99-162 on Policy For Regulatory Actions for Licensees of Nuclear Power Plants That Have Not Completed Year 2000 Readiness Activities

(also see Staff Requirements Memorandum for SECY-99-162)

05/18/1999 - Commission Policy Paper SECY-99-135 on Interim Enforcement Policy Regarding Enforcement Discretion For Nuclear Power Plants During the Year 2000 Transition (also see Staff Requirements Memorandum for SECY-99-135)

05/18/1999 - Commission Policy Paper SECY-99-134 on Agency Contingency Plans for the Year 2000 Computer Problem in the Nuclear Industry (also see Staff Requirements Memorandum for SECY-99-134)

02/11/1999 - Transcript of Nuclear Regulatory Commission meeting on Y2K with John Koskinen of the President's Council on Year 2000 Conversion, the Nuclear Energy Institute, the Nuclear Information and Resource Service, and the NRC staff (also see Staff Requirements Memorandum)

01/06/1999 - Commission Policy Paper SECY-99-003 on Proposed Supplement 1 to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

05/01/1998 - Commission Information Paper SECY 98-094 on Proposed NRC Generic Letter 98-XX, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," Request for Comment on proposed NRC Generic Letter, and Resolution of Public Comments

09/24/1997 - Commission Information Paper SECY 97-213 on Year 2000 Computer Issue

CONGRESSIONAL TESTIMONY AND PUBLIC SPEECHES

11/15/1999 - Letter from Chairman Meserve to Senators Bennett and Dodd on Y2K Issues

08/03/1999 - Presentation by Chairman Dicus at National Press Club on Y2K Issues

07/14/1999 - Presentation by Chairman Dicus at the NRC Y2K Training And Tabletop Exercise, Doubletree Hotel, Rockville, MD

02/24/1999 - Congressional Testimony by NRC Executive Director for Operations William D. Travers on the Year 2000 Computer Problem

02/09/1999 - Presentation by Chairman Jackson to the OECD/NEA on the Impact of the Year 2000 on the Nuclear Industry, Ottawa, Canada

06/12/1998 - Congressional Testimony by Chairman Jackson on Year 2000 Readiness of the Utility Industry

05/14/1998 - Congressional Testimony by NRC Deputy Executive Director for Operations Hugh L. Thompson, Jr. on Year 2000 Effect on Energy Utilities

CONTINGENCY PLANNING

09/01/1999 - Year 2000 Early Warning System (YEWS) Frequently Asked Questions

07/14/1999 - NRC Y2K Training and Tabletop Exercise, Doubletree Hotel, Rockville, MD

NRC Contingency Plan for the Year 2000 Issue in the Nuclear Industry
[Adobe Acrobat (1 ,173KB) or Corel WordPerfect (2 ,758KB) format]

05/18/1999 - Commission Policy Paper SECY-99-134 on Agency Contingency Plans for the Year

2000 Computer Problem in the Nuclear Industry (also see Staff Requirements Memorandum for SECY-99-134)

01/20/1999 - Federal Register Notice of Availability and Request for Comments on *NRC Contingency Plan for the Year 2000 Issue*

11/03/1998 - **Draft** NRC Contingency Plan for the Year 2000 Issue in the Nuclear Industry (also see Staff Requirements Memorandum for COMSECY-98-036 including comments from Chairman Jackson, Commissioner Merrifield, and Commissioner McGaffigan)

FEDERAL REGISTER NOTICES

08/23/1999 - Federal Register Notice: *Denial of Petition for Rulemaking (PRM-50-65) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

08/23/1999 - Federal Register Notice: *Denial of Petition for Rulemaking (PRM-50-66) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

08/23/1999 - Federal Register Notice: *Denial of Petition for Rulemaking (PRM-50-67) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

07/30/1999 - Federal Register Notice: *Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition* [available in TXT or PDF format]

01/25/1999 - Federal Register Notice: *Petition for Rulemaking (PRM-50-65) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

01/25/1999 - Federal Register Notice: *Petition for Rulemaking (PRM-50-66) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

01/25/1999 - Federal Register Notice: *Petition for Rulemaking (PRM-50-67) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

01/20/1999 - Federal Register Notice of Availability and Request for Comment: *NRC Contingency Plan for the Year 2000 Issue* [available in TXT or PDF format]

05/19/1998 - Federal Register Notice: *Year 2000 Readiness of Computer Systems at Nuclear Power Plants* [available in TXT or PDF format]

01/29/1998 - Federal Register Notice: *Proposed Generic Communication on Year 2000 Readiness of Computer Systems at Nuclear Power Plants* [available in TXT or PDF format]

FREQUENTLY ASKED QUESTIONS

GENERIC CORRESPONDENCE

12/17/1999 - Information Notice 99-32, *The Effect of the Year 2000 Issue on Medical Licensees*

12/01/1999 - N RC Regulatory Issue Summary 99-05, *Implementing Procedure for Power Reactor Notices of Enforcement Discretion (NOEDs) Processed During the Y2K Transition*

08/10/1999 - Information Notice 99-25, *Year 2000 Contingency Planning Activities*

06/25/1999 - Information Notice 99-20, *Contingency Planning for the Year 2000 Computer Problem*

06/14/1999 - Information Notice 99-18, *Update on NRC'S Year 2000 Activities for Materials Licensees and Fuel Cycle Licensees and Certificate Holders*

04/28/1999 - Information Notice 99-12, *Year 2000 Computer Systems Readiness Audits*

01/14/1999 - Generic Letter 99-01 Supplement 1, *Year 2000 Readiness of Computer Systems at Nuclear Power Plants*

08/12/1998 - Information Notice 98-30, *Effect of the Year 2000 Computer Problem on NRC Licensees and Certificate Holders*

06/22/1998 - Generic Letter 99-25, *NMSS Licensees' and Certificate Holders' Year 2000 Readiness Programs*

05/11/1998 - Generic Letter 99-01 , *Year 2000 Readiness of Computer Systems at Nuclear Power Plants*

08/06/1997 - Information Notice 97-61, *U.S. Department of Health and Human Services Letter to Medical Device Manufacturers on the Year 2000 Problem*

12/24/1996 - Information Notice 96-70, *Year 2000 Effect on Computer System Software*

NUCLEAR REACTORS

12/01/1999 - NRC Regulatory Issue Summary 99-05, *Implementing Procedure for Power Reactor Notices of Enforcement Discretion (NOEDs) Processed During the Y2K Transition*

09/07/1999 - NUREG-1706, *Year 2000 Readiness in U.S. Nuclear Power Plants*

07/30/1999 - Federal Register Notice: *Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition* [available in TXT or PDF format]

07/19/1999 - Preliminary Report on Nuclear Power Plant Year 2000 Readiness [also available in Adobe Acrobat (PDF) format]

07/07/1999 - Summary of Licensee Reports on the Status of Y2K Readiness at Nuclear Power Plants

06/22/1999 - Commission Policy Paper SECY-99-162 on Policy For Regulatory Actions for Licensees of Nuclear Power Plants That Have Not Completed Year 2000 Readiness Activities (also see Staff Requirements Memorandum for SECY-99-162)

05/18/1999 - Commission Policy Paper SECY-99-135 on Interim Enforcement Policy Regarding Enforcement Discretion For Nuclear Power Plants During the Year 2000 Transition (also see Staff Requirements Memorandum for SECY-99-135)

May 1999-June 1999 - NRC audits of Year 2000 Contingency Planning Programs for (12 units at) 6 reactor sites:

Diablo Canyon 1 & 2	Duane Arnold
Indian Point 2	Oconee 1, 2 & 3

Palo Verde 1, 2 & 3	Turkey Point 3 & 4

04/28/1999 - NRC Information Notice 99-12, *Year 2000 Computer Systems Readiness Audits*

04/13/1999 - Final NRC Inspection Manual Temporary Instruction TI-2515/141 for *Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants* with Attachment A (Y2K Review Checklist) and Attachment B (Sample Listing for the Y2K Review Checklist)

03/22/1999 - Draft NRC Inspection Manual Temporary Instruction and Checklist for *Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants*

01/14/1999 - NRC Generic Letter 98-01 Supplement 1: Year 2000 Readiness of Computer Systems at Nuclear Power Plants

01/06/1999 - Commission Policy Paper SECY-99-003 on Proposed Supplement 1 to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

September 1998-January 1999 - NRC audits of Year 2000 Readiness Programs for (16 units at) 12 reactor sites:

Braidwood 1 & 2	Brunswick 1 & 2
Davis Besse	Hope Creek
Limerick 1 & 2	Monticello
North Anna 1 & 2	Seabrook
Waterford 3	Watts Bar
WNP-2	Wolf Creek

08/13/1998 - NRC Year 2000 Readiness Audit Plan *(for NRC staff review of the above nuclear power plants)*

05/11/1998 - NRC Generic Letter 98-01: *Year 2000 Readiness of Computer Systems at Nuclear Power Plants*

05/01/1998 - Commission Information Paper SECY 98-094 on Proposed NRC Generic Letter 98-XX, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," Request for Comment on proposed NRC Generic Letter, and Resolution of Public Comments

09/24/1997 - Commission Information Paper SECY 97-213 on Year 2000 Computer Issue

12/24/1996 - NRC Information Notice 96-70: *Year 2000 Effect on Computer System Software*

NUCLEAR MATERIALS

12/17/1999 - Information Notice 99-32, *The Effect of the Year 2000 Issue on Medical Licensees*

09/13/1999 - Revision to NRC Policy for Regulatory Actions for Nuclear Power Plants That Have Not Completed Y2K Readiness Activities by July 1, 1999 [available in HTML or PDF format]

06/14/1999 - Information Notice 99-18, *Update on NRC'S Year 2000 Activities for Materials Licensees and Fuel Cycle Licensees and Certificate Holders*

08/12/1998 - NRC Information Notice 98-30: *Effect of the Year 2000 Computer Problem on Material and Fuel Cycle Licensees and Certificate Holders*

06/22/1998 - NRC Generic Letter 98-03: *NMSS Licensees' and Certificate Holders' Year 2000 Readiness Programs*

December 1997 - Activities involving Materials and Fuel Cycle Licensees

08/06/1997 - NRC Information Notice 97-61: *U.S. Department of Health and Human Services Letter, to Medical Device Manufacturers, on the Year 2000 Problem*

12/24/1996 - NRC Information Notice 96-70: *Year 2000 Effect on Computer System Software*

PRESS RELEASES

01/01/2000 - Press Release 00-004, *All Nuclear Facilities in The United States Transition Safely Through Y2K Rollover*

01/01/2000 - Press Release 00-003, *All Nuclear Facilities in Mountain Time Zone Transition Safely Through The Y2K Rollover*

01/01/2000 - Press Release 00-002, *All Nuclear Facilities in The Midwest Transition Safely Through The Y2K Rollover*

01/01/2000 - Press Release 00-001, *All Nuclear Facilities in Eastern United States Transition Safely Through Y2K Rollover*

12/30/1999 - Press Release II-99-058, *NRC Region II to Monitor Nuclear Plants in The Southeast During Y2K Transition*

12/28/1999 - Press Release I-99-105, *NRC Region I to Monitor Northeast Plants During Y2K Transition*

12/23/1999 - Note to Editors 99-271, *NRC Staffing for Media Assistance During Y2K Transition*

12/23/1999 - Press Release 99-268, *NRC Finds No Outstanding Y2K Problems at Nuclear Plants Undergoing Decommissioning*

11/08/1999 - Press Release 99-240, *NRC Confirms That All Nuclear Power Plants Are Fully Y2K-ready*

10/19/1999 - Press Release 99-220, *NRC Conducts Full-scale Emergency Preparedness Exercise in Preparation for Y2K*

09/28/1999 - Press Release 99-207, *NRC Sends Letters to Utilities to Follow up Y2K Readiness at Nuclear Power Plants*

09/07/1999 - Press Release 99-191, *NRC Issues Report Confirming No Y2K Problems Affecting Safety Systems of Nuclear Power Plants - Updates Y2K Readiness Status*

09/02/1999 - Press Release 99-187, *NRC to Meet with NEI to Discuss Nuclear Industry's Y2K Activities*

08/27/1999 - Press Release 99-175, *NRC Denies Three Petitions from NIRS on Year 2000 Concerns*

08/06/1999 - Press Release 99-168, *NRC Establishes Policy for Regulatory Actions for Nuclear Power Plants that are not "Y2K Ready"*

07/22/1999 - Press Release 99-153, *NRC Issues Interim Enforcement Policy on Y2K*

07/20/1999 - Press Release 99-152, *NRC Finds 89 Nuclear Power Plants Implementing Y2K Programs Consistent with Guidance; 14 Plants Require NRC Follow-Up*

07/15/1999 - Press Release 99-150, *NRC Hosted Tabletop Exercise in Preparation for Y2K*

07/07/1999 - Press Release 99-138, *Nuclear Power Plants Report Safety Systems are Y2K Ready*

06/14/1999 - Press Release 99-123, *NRC Plans for Y2K Contingencies*

06/14/1999 - Press Release 99-122, *NRC to Meet with Nuclear Energy Institute on Y2K Issue on June 15*

04/28/1999 - Press Release 99-87, *Nuclear Power Plants on Track For Achieving Y2k Compliance by July 1*

03/23/1999 - Press Release 99-57, *NRC to Review Y2K Programs at All 103 Operating Nuclear Plants and Conduct Special Contingency Plan Audits at Six Plants*

02/08/1999 - Press Release 99-23, *NRC Completes Work on Preparing Its Internal Computer Systems For Year 2000 Readiness*

02/05/1999 - Press Release 99-21, *NRC to Hold Briefing on Year 2000 Issues*

01/21/1999 - Press Release 99-10, *NRC Requests Information from Nuclear Power Plant Licensees About Overall Year 2000 Readiness*

12/08/1998 - Press Release 98-219, *NRC Makes Available Staff Draft Year 2000 Contingency Plan*

10/22/1998 - Press Release 98-191, *NRC Status Report on Efforts to Head Off Computer Problems in Year 2000*

09/21/1998 - Press Release 98-172, *NRC Auditing Nuclear Power Plant Year 2000 Readiness Programs*

06/29/1998 - Press Release 98-106, *NRC Requires Information From Uranium Processors About "Year 2000" Computer Readiness*

05/12/1998 - Press Release 98-68, *NRC Requires Information From Nuclear Power Plant Licensees About "Year 2000" Readiness of Computer Systems*

01/28/1998 - Press Release 98-16, *NRC Seeks Information on "Year 2000" Readiness of Nuclear Power Plant Computer Systems; Asks Public Comment on Proposed Letter to Licensees*

STATUS REPORTS

09/07/1999 - NUREG-1706, *Year 2000 Readiness in U.S. Nuclear Power Plants*

07/19/1999 - Preliminary Report on Nuclear Power Plant Year 2000 Readiness [also available in Adobe Acrobat (PDF) format]

07/07/1999 - Summary of Licensee Reports on the Status of Y2K Readiness at Nuclear Power Plants

Status Reports to OMB on NRC Y2K Efforts

November 1999

August 1999

May 1999

February 1999

November 1998

August 1998

May 1998

February 1998

November 1997

August 1997

Status Reports to the Commission on NRC Y2K Efforts

December 1999

November 1999

October 1999

September 1999

August 1999

July 1999

June 1999

May 1999

April 1999

January 1999

October 1998

September 1998

NRC YEAR 2000 POINTS-OF-CONTACT

FEDERAL GOVERNMENT Y2K INFORMATION

U.S. GOVERNMENT GATEWAY FOR Y2K INFORMATION

President's Council on Year 2000 Conversion

Year 2000 Information and Readiness Disclosure Act

Chief Information Officers Council Committee on Year 2000

Year 2000 Compliant Products and Services

Federal Year 2000 Commercial Off-the-Shelf (COTS) Product Database

Federal Year 2000 Telecommunications Site

Defense Information Systems Agency (DISA) Sponsored Year 2000 Products Compliance Catalog

Recommended Year 2000 Contract Language

Year 2000 Best Practices

Standards and Time Related Information

Year 2000 Legal Issues

State Government Year 2000 Connections
[also see National Governors' Association]

International Year 2000 Connections

Industry Year 2000 Connections

Year 2000 Related Conferences

NUCLEAR INDUSTRY Y2K INFORMATION

NUCLEAR ENERGY INSTITUTE and NUCLEAR UTILITIES SOFTWARE MANAGEMENT GROUP

August 1999 - NEI Nuclear Industry Y2K Readiness Status Report

09/02/1999 - NRC Press Release 99-187, *NRC to Meet with NEI to Discuss Nuclear Industry's Y2K Activities*

August 1998 - NEI/NUSMG 98-07, *Nuclear Utility Year 2000 Readiness: Contingency Planning*

October 1997 - NEI/NUSMG 97-07, *Nuclear Utility Year 2000 Readiness*

10/07/1997 - NRC Summary of Meeting on Year 2000 Issues with the Nuclear Energy Institute

NUCLEAR INFORMATION AND RESOURCE SERVICE

08/23/1999 - Federal Register Notice: *Denial of Petition for Rulemaking (PRM-50-65) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

08/23/1999 - Federal Register Notice: *Denial of Petition for Rulemaking (PRM-50-66) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

08/23/1999 - Federal Register Notice: *Denial of Petition for Rulemaking (PRM-50-67) by the Nuclear Information and Resource Service* [available in TXT or PDF format]

07/02/1999 - Commission Policy Paper SECY-99-173 on Denial of Petitions for Rulemaking Submitted by the Nuclear Information and Resource Service (also see Staff Requirements Memorandum for SECY-99-173)

01/25/1999 - Federal Register Notice [available in TXT or PDF format] regarding Petition for

Rulemaking (PRM-50-65) on **Y2K and shut-down of nuclear facilities** by the Information and Resource Service (Comments)

01/25/1999 - Federal Register Notice [available in TXT or PDF format] regarding Petition for Rulemaking (PRM-50-66) on **Y2K and emergency planning** by the Nuclear Information and Resource Service (Comments)

01/25/1999 - Federal Register Notice [available in TXT or PDF format] regarding Petition for Rulemaking (PRM-50-67) on **Y2K and availability of back-up power** by the Nuclear Information and Resource Service (Comments)

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United States Nuclear Regulatory Commission

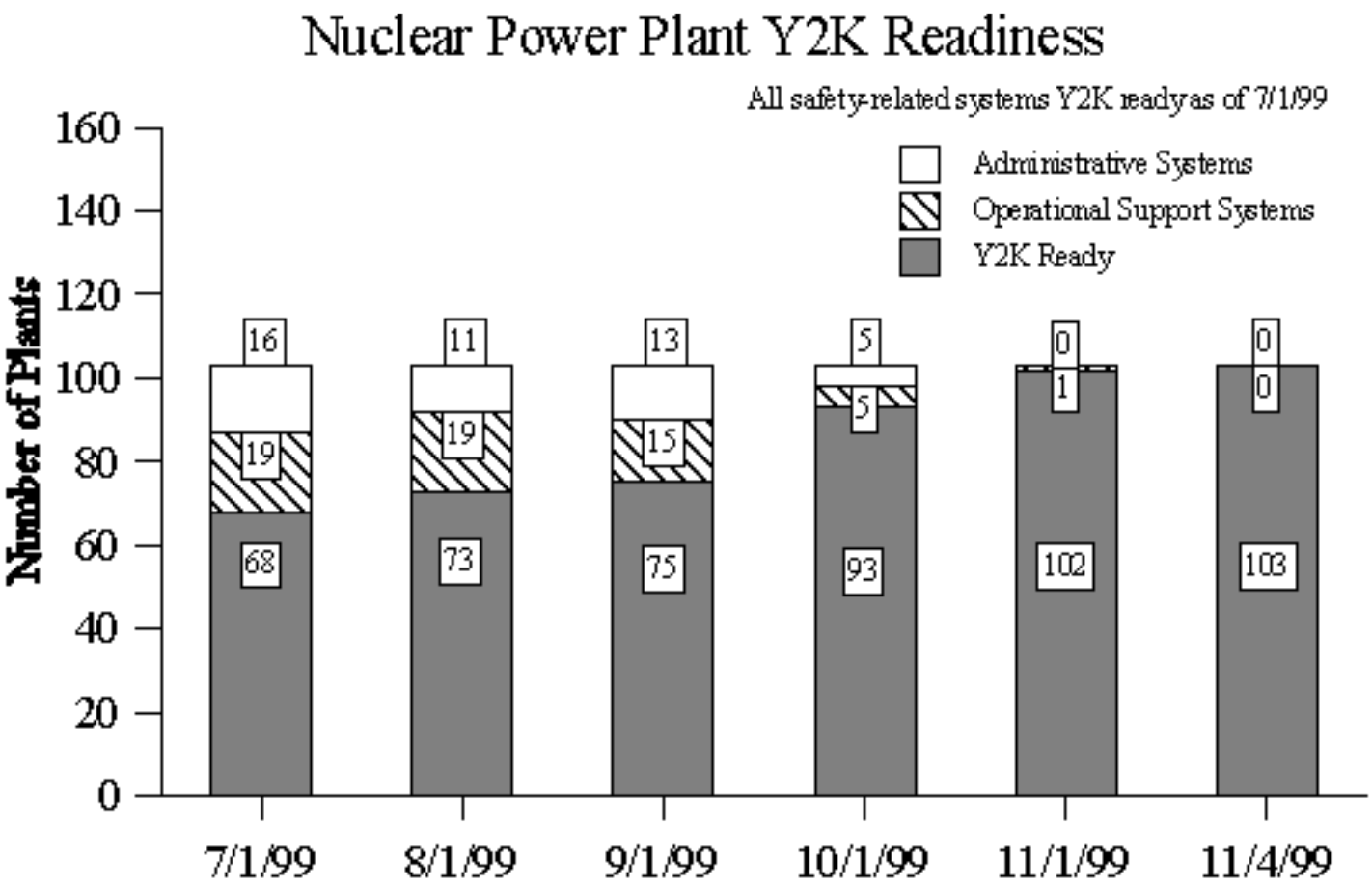
Status Report on Year 2000 Activities for December 1999

INTRODUCTION

This report is the twelfth periodic report on the status of agency Y2K activities. The report covers the period from November 1 through November 30, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

As noted in previous reports, the staff had sent letters to the licensees of 12 facilities that were not expected to be Y2K ready by September 30, 1999, to confirm their completion schedules and tasks for remaining work. The staff determined that these plants with Y2K work remaining were continuing to progress toward Y2K readiness. In fact, by September 30, we received licensee reports indicating that only 10 of the 12 plants had Y2K work remaining and 93 plants were Y2K ready. During October, we received letters indicating that Y2K ready status had been achieved by nine of these remaining ten plants. On November 4, the NRC received a letter indicating that Y2K readiness had been achieved by the final plant, Farley 2, ahead of the December 16-scheduled date. Therefore, the NRC has now received Y2K readiness status reports from licensees indicating that all 103 nuclear power plants are Y2K ready. Table 1 provides a summary of nuclear power plant (NPP) Y2K readiness status. The following chart illustrates plant readiness.



The solid shaded regions of the chart represent the number of NPPs that were Y2K ready on the corresponding date. The diagonally shaded regions of the chart represent the number of NPPs that were not scheduled to be Y2K ready on the corresponding date, and had systems to be remediated that could affect power operations. (Remediation is defined in Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 98-07 "Nuclear Utility Year 2000 Readiness Contingency Planning" as the process of retiring, replacing, or modifying software or devices that have been determined to be affected by the Y2K problem.) The unshaded regions of the chart represent the number of NPPs that were not scheduled to be Y2K ready on the corresponding date, and that had only systems that could affect NPP administrative functions to be remediated.

The staff monitored the progress of the work to be performed and independently verified completion of scheduled items, including Y2K contingency plans. All licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond. Therefore, we do not anticipate the need for the NRC to direct any plant-specific action.

OTHER Y2K RELATED ACTIVITIES

The staff responded to Y2K related controlled correspondence from Senators Robert Bennett, Christopher Dodd, and Paul Coverdale, as well as Congressman Tierney. The staff also responded to two Y2K related correspondences from Senator Susan Collins.

The staff has developed and issued a Temporary Instruction to inspect licensee Y2K program activities at selected decommissioning reactors. Facilities that were not selected for inspection have been shutdown for at least 6 years and either do not present a spent fuel pool heat load concern or fuel has been removed

from the spent fuel pool. The facilities to be inspected are as follows:

Millstone Unit 1

Haddam Neck

Maine Yankee

Big Rock Point

Zion Units 1 and 2

The inspections are to be completed during the weeks of December 6 and December 13, 1999.

Lessons learned from the October 15, 1999, full scale exercise were incorporated into the NRC's Y2K Contingency Plan for the Nuclear Industry. The Office of Nuclear Reactor Regulation's staff is also continuing preparations for the Y2K transition. This includes participation in the December 8 White House Information Coordination Center (ICC) drill and refresher training for Headquarters response team members to be held in late December.

The staff issued the Implementing Procedure for Y2K-related Notice of Enforcement Discretion issues, for use during the Y2K transition. This procedure is being transmitted to all licensees of operating nuclear power plants via a Regulatory Issues Summary, dated December 1, 1999, and is available at NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

On December 3, 1999, the U.S. Food and Drug Administration (FDA) and NRC held their annual meeting. During the meeting, the Y2K activities of both agencies were discussed. NRC will be notified of reports to FDA's MedWatch reporting system, a system that tracks significant health hazards associated with the use of medical products.

The Office of Nuclear Material Safety and Safeguards (NMSS) will issue a final Information Notice (IN) to medical licensees. The IN will discuss NRC's concerns with treatment planning systems and the reporting requirements of 10 CFR Part 21 and FDA's MedWatch reporting system.

NMSS provided an updated Y2K webpage to the Office of the Chief Information Officer which included (1) a summary of the conclusions of the Y2K follow-up inspections at the Portsmouth and Paducah gaseous diffusion plants and (2) the projected operating status of the ten major fuel facilities during the Y2K transition.

As part of the lessons learned from the October 15, 1999, NRC Y2K exercise, (1) NMSS provided definitions of the terms "Alert" and "Site Area Emergency" used by fuel cycle facilities to the Office of Public Affairs and (2) the Paducah and Portsmouth gaseous diffusion plants were added to the Y2K Early Warning System (YEWS) and will be contacted by the NRC for a status check at 12:15 a.m. on January 1, 2000.

NMSS contacted the Westinghouse fuel fabrication facility to get an update on the Y2K readiness status of the facility. The facility will be shutdown prior to, and remain shutdown during the Year 2000 transition period. Westinghouse plans to provide documentation of Y2K readiness to the NRC by December 24, 1999.

NMSS briefed the NRC spokesmen to the ICC (Miraglia and Wermiel) regarding the two gaseous diffusion plants that will be operating during the Y2K transition.

NMSS received confirmation from BWX Technologies that the site has plans for a controlled startup after the Y2K transition. This means that the eight major fuel cycle facilities which will only be performing low-risk, low-safety-significant activities during the Y2K transition.

An updated status of the Y2K readiness of fuel cycle facilities as of December 10, 1999 is provided as Table 2 (Attachment 1B)

CONGRESSIONAL INTERACTION

In late November, Rep. Horn (R-CA) issued his final report card on federal agencies' internal Y2K efforts; the NRC earned an "A." The government-wide grade was a "B+." OCA continues to receive congressional telephone and written inquiries regarding Y2K and nuclear power plants.

CONTINGENCY PLANNING AND INTERNATIONAL PROGRAMS

The staff participated in a "stressed" exercise at the ICC on December 8 and 9. The ICC team, led by Frank Miraglia, the NRC Deputy Executive Director for Reactor Programs, coordinated information concerning potential Y2K problems with the Headquarters Operations Center, the Regional Incident Response Centers , appropriate Federal agencies, and the President's Council on the Year 2000. This included testing a procedure developed jointly by NRC, DOE, EPA, and the State Department to share, validate, and coordinate the Federal response to a reported nuclear power plant problem in a foreign country. Although the "stressed" exercise proved to be a valuable learning experience for the ICC team, it highlighted the need for further improvement in the way information is coordinated with the DOE Operations Center. Consequently, the staff plans to reassign a Y2K response team member from the Headquarters Operations Center to the DOE Operations Center during the Y2K transition.

The staff used the December 8 and 9 ICC exercise to test certain aspects of the Y2K Contingency Plan that were not fully tested during the October 15 exercise. For example, an open telecommunications link between the NRC Operations Center, the Regional Incident Response Centers, and the ICC Operations Center was maintained throughout the exercise. Changes that have been implemented based on the lessons-learned from the October 15 exercise were also tested. The staff successfully demonstrated that it can obtain plant status information and enter it into YEWS in a rapid manner (in about 15 minutes or less). The ability of the early monitoring team to obtain, analyze, and coordinate information from various sources, such as YEWS, was also successfully tested.

The staff also completed several significant infrastructure enhancements to the Headquarters Operations Center and the Regional Incident Response Centers in preparation for the Y2K transition. One Iridium satellite phone was installed in each Regional Incident Response Center and two additional phones (for a total of three) were installed in the Headquarters Operations Center. A dedicated FEMA National Warning System (NAWAS) circuit to the Headquarters Operations Center was also installed. The staff is working with DOE to install a circuit for the DOE Emergency Communication Network. Modifications to add the Region IV Incident Response Center and supporting infrastructure to the building owner's emergency diesel generator are expected to be completed by December 23. Also by that time, Region IV expects to complete installation of 23 additional phone lines to assure that they will be equipped to handle a large volume of phone traffic in their back-up role to headquarters for Y2K and continuity of

operations.

While the principal focus of the NRC's Y2K contingency planning effort remains on the Y2K transition in the U.S. and the potential effect on our licensees, there is an increased awareness that Y2K problems are more likely to occur outside of the United States. Based on lessons learned from the Tokaimura criticality accident, the staff has assigned a Senior Executive Service manager (Carl Paperiello, Deputy Executive Director for Materials, Research and State Programs) to the ICC during the day and early evening hours of December 31. He will respond to questions or inquiries from media or other ICC sectors related to the ramifications (for NRC licensees) of a reported foreign nuclear facility problem.

Membership in YEWS for civilian nuclear installations has increased to 33 countries: Argentina, Austria, Australia, Belgium, Brazil, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Korea (Republic Of), Lithuania, Mexico, Netherlands, Norway, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine , United Kingdom, and the United States of America.

YEWS performed as designed during two encompassing exercises with international participation on December 8 and 9. Final development work on YEWS, which includes enhancing the security features and reporting formats, will be completed on December 23.

Information from YEWS will be shared with the ICC and U.S. government agencies.

PUBLIC AFFAIRS AND Y2K COMMUNICATIONS ACTIVITIES

During the month of November 1999, the NRC Web site saw a slight increase in demand for Year 2000 information. The NRC Year 2000 Page moved from 26th to 23rd most requested page on the NRC Web site. It also remains among the ten most popular single entry pages. A single entry page indicates a visitor knows exactly where to look, meaning the page was either bookmarked or the address was taken from another source, such as a press release.

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," (an Adobe Acrobat file) dropped from 6th to 11th most downloaded file on the NRC Web site. However, Chairman Meserve's recent letter to Senators Bennett and Dodd on Y2K issues was the 8th most popular download.

During November, the Office of Public Affairs issued one press release on Y2K--

On November 8, NRC issued a press release announcing that NRC had confirmed that all nuclear power plants were fully Y2K-ready.

In addition, the NRC staff responded to many written inquiries from members of the public.

Attachments:
Table 1, "NPP Y2K Readiness Status as of November 1, 1999"
Table 2, "Fuel Fabrication and Gaseous Diffusion Plant Systems and Components Requiring Completion of Year 2000 Readiness Activities as of November 1, 1999"

Table 1 NPP Y2K Readiness Status as of December 1, 1999		
NPP Name	**NPP Licensee**	**Readiness Status/Date**

Arkansas Nuclear One, Units 1 and 2	Entergy Operations, Inc.	Y2K Ready
Beaver Valley Power Station, Units 1 and 2	Duquesne Light Company	Y2K Ready
Braidwood Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Browns Ferry Nuclear Power Station, Units 2 and 3	Tennessee Valley Authority	Y2K Ready
Brunswick Steam Electric Plant, Units 1 and 2	Carolina Power and Light Company	Y2K Ready
Byron Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Callaway Plant, Unit 1	Union Electric Company	Y2K Ready
Calvert Cliffs Nuclear Power Plant, Units 1 and 2	Baltimore Gas and Electric Company	Y2K Ready
Catawba Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Clinton Power Station, Unit 1	Illinois Power Company	Y2K Ready
Comanche Peak Steam Electric Station, Unit 1	Texas Utilities Electric Company	Y2K Ready
Comanche Peak Steam Electric Station, Unit 2	Texas Utilities Electric Company	Y2K Ready
Cooper Nuclear Station	Nebraska Public Power District	Y2K Ready
Crystal River Unit 3 Nuclear Generating Plant	Florida Power Corporation	Y2K Ready
Davis-Besse Nuclear Power Station, Unit 1	First Energy Services Corporation	Y2K Ready
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Pacific Gas and Electric Company	Y2K Ready
Donald C. Cook Nuclear Plant, Units 1 and 2	Indiana Michigan Power Company	Y2K Ready
Dresden Nuclear Power Station, Units 2 and 3	Commonwealth Edison Company	Y2K Ready
Duane Arnold Energy Center	IES Utilities, Inc.	Y2K Ready
Edwin I. Hatch Nuclear Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Enrico Fermi Atomic Power Plant, Unit 2	Detroit Edison Company	Y2K Ready
Fort Calhoun Station, Unit 1	Omaha Public Power District	Y2K Ready
Grand Gulf Nuclear Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
H. B. Robinson Plant, Unit 2	Carolina Power and Light Company	Y2K Ready
Hope Creek Nuclear Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	Y2K Ready

Indian Point Unit No. 2	Consolidated Edison Company of New York, Inc.	Y2K Ready
Indian Point Station, Unit 3	Power Authority of the State of New York	Y2K Ready
James A. FitzPatrick Nuclear Power Plant	Power Authority of the State of New York	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 1	Southern Nuclear Operating Company, Inc.	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Kewaunee Nuclear Power Plant	Wisconsin Public Service Corporation	Y2K Ready
LaSalle County Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Limerick Generating Station, Unit 1	PECO Energy Company	Y2K Ready
Limerick Generating Station, Unit 2	PECO Energy Company	Y2K Ready
Millstone Nuclear Power Station, Units 2 and 3	Northeast Nuclear Energy Company	Y2K Ready
Monticello Nuclear Generating Plant	Northern States Power Company	Y2K Ready
Nine Mile Point Nuclear Station, Units 1 and 2	Niagara Mohawk Power Corporation	Y2K Ready
North Anna Power Station, Unit 1	Virginia Electric and Power Company	Y2K Ready
North Anna Power Station, Unit 2	Virginia Electric and Power Company	Y2K Ready
Oconee Nuclear Station, Units 1, 2, and 3	Duke Energy Corporation	Y2K Ready
Oyster Creek Nuclear Generating Station	GPU Nuclear Corp.	Y2K Ready
Palisades Nuclear Plant	Consumers Energy Company	Y2K Ready
Palo Verde Nuclear Generating Station, Units 1, 2, and 3	Arizona Public Service Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 2	PECO Energy Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 3	PECO Energy Company	Y2K Ready
Perry Nuclear Power Plant, Unit 1	First Energy Nuclear Operating Company	Y2K Ready
Pilgrim Nuclear Power Station, Unit 1	Boston Edison Company	Y2K Ready
Point Beach Nuclear Plant, Units 1 and 2	Wisconsin Electric Power Company	Y2K Ready
Prairie Island Nuclear Generating Plant, Units 1 and 2	Northern States Power Company	Y2K Ready

Quad Cities Nuclear Power Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
River Bend Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
Robert Emmet Ginna Nuclear Plant, Unit 1	Rochester Gas and Electric Corp.	Y2K Ready
Salem Nuclear Generating Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	Y2K Ready
Salem Nuclear Generating Station, Unit 2	Public Service Electric and Gas Co. of New Jersey	Y2K Ready
San Onofre Nuclear Generating Station, Units 2 and 3	Southern California Edison Company	Y2K Ready
Seabrook, Unit 1	North Atlantic Energy Service Corporation	Y2K Ready
Sequoyah Nuclear Plant, Units 1 and 2	Tennessee Valley Authority	Y2K Ready
Shearon Harris Nuclear Power Plant, Unit 1	Carolina Power and Light Company	Y2K Ready
South Texas Project Electric Generating Station, Units 1 and 2	South Texas Project Nuclear Operating Company	Y2K Ready
St. Lucie Plant, Units 1 and 2	Florida Power and Light Company	Y2K Ready
Surry Power Station, Units 1 and 2	Virginia Electric and Power Company	Y2K Ready
Susquehanna Steam Electric Station, Units 1 and 2	Pennsylvania Power and Light Company	Y2K Ready
Three Mile Island Nuclear Station, Unit 1	GPU Nuclear Corp.	Y2K Ready
Turkey Point Plant, Units 3 and 4	Florida Power and Light Company	Y2K Ready
Vermont Yankee Nuclear Power Station	Vermont Yankee Nuclear Power Corporation	Y2K Ready
Virgil C. Summer Nuclear Station, Unit 1	South Carolina Electric & Gas Company	Y2K Ready
Vogtle Electric Generating Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Washington Public Power Supply System Nuclear Project No. 2	Washington Public Power Supply System	Y2K Ready
Waterford Steam Electric Station, Unit 3	Entergy Operations, Inc.	Y2K Ready
Watts Bar Nuclear Plant, Unit 1	Tennessee Valley Authority	Y2K Ready
William B. McGuire Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Wolf Creek Generating Station	Wolf Creek Nuclear Operating Corporation	Y2K Ready

Table 2 Status of Year 2000 Readiness Activities at Fuel Cycle Facilities as of November 1, 1999

Site	Type of Facility [1]	Is Site Y2K Ready?	Will Site be Operating During Y2K Transition?	Does Site have Plans for Controlled Startup after Y2K Transition?	Systems That Need to be Made Y2K Ready	When Will Site be Y2K Ready?
AlliedSignal	UF6	Yes	No	Yes	N/A	07/01/99
BXW Technologies	HEU	Yes	No	Yes	N/A	11/01/99
Combustion Engineering-Hematite	LEU	Yes	No	Yes	N/A	07/01/99
Framatome Cogema Fuels	LEU	Yes	No	Yes	N/A	07/01/99
General Electric-Wilmington	LEU	Yes	No	Yes	N/A	09/01/99
Nuclear Fuel Services	HEU	Yes	No	Yes	N/A	11/01/99
Siemens Power Corporation	LEU	Yes	No	Yes	N/A	11/01/99
United States Enrichment Corporation	GDP	Yes, for both facilities	Yes, for both facilities	N/A	N/A	07/01/99
Westinghouse Electric Company	LEU	No	No	Yes	Chemical Area Manufacturing Processing System (ChAMPS) [2] Westinghouse Accountability, Tracking, and Traceability System	12/24/99

[1] Legend:

GDP = Gaseous Diffusion Enrichment Facility HEU = High Enriched Uranium Fuel Fabrication Facility

LEU = Low Enriched Uranium Fuel Fabrication Facility UF6 = Uranium Hexafluoride Production Facility

[2] Westinghouse:

The current Item Control System (ICS) that will be replaced by ChAMPS will not be Y2K ready until February 2000. If ChAMPS and the backup systems in the contingency plan do not work, then the current ICS would be used next in April 2000. Otherwise, the current ICS will be eliminated in April 2000.

Notes:

- NRC inspected the Y2K status at the facilities in 1997 and 1998, in conjunction with other safety inspections
- NRC conducted follow-up Y2K inspections at the Portsmouth GDP in August 1999 and at the Paducah GDP in September 1999

- NRC will have cognizant staff in the HQ Operations Center to respond to the facilities during the Y2K transition on December 31, 1999
- NRC will have cognizant staff in the Region IV IRC to respond to the facilities during the Y2K transition on December 31, 1999
- NRC will have a resident inspector at each GDP and HEU during the Y2K transition on December 31, 1999

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

December 24, 1996

NRC INFORMATION NOTICE 96-70: YEAR 2000 EFFECT ON COMPUTER SYSTEM SOFTWARE

Addressees

All U.S. Nuclear Regulatory Commission licensees, certificate holders, and registrants (hereafter referred to as licensees).

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to the potential problems their computer systems and software may encounter as a result of the change to the new century. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid potential problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances

Earlier this year, the U.S. House of Representatives held hearings on an issue known as the "Year 2000" software problem. These hearings identified that some of the most important computer software used by the Federal government may not work correctly starting in the year 2000, because the software can only use single years or decades in performing calculations; it will not be able to recognize a change to the new century. Many computer systems will potentially fail to recognize this change to a new century and will misread "00" or the year 2000, as 1900, and thus may cause the system to fail or generate faulty data. The NRC, along with several other Federal agencies, is currently examining computer software used to support Agency functions that may be affected. Specific problems have already been identified and will be corrected. In some instances where future dates are used to schedule actions, problems have already occurred -- well before the end of the century.

Discussion

The Year 2000 issue affects everyone. It will have an impact on State and local governments, NRC licensees, and businesses. The magnitude of the Year 2000 issue poses a challenge to all those potentially affected. Dates are involved in many facets of computer systems and software. Neither industry nor the Federal government has yet identified the scope of the situation.

This issue may affect NRC licensees in many different ways. For example, computer software used to calculate dose or to account for radioactive decay may not recognize the turn of the century, which could lead to incorrectly calculated doses or exposure times for treatment planning. Other examples of software that may be affected include security control, radiation monitoring, technical specification surveillance testing, and accumulated burn-up programs. Also, equipment that licensees have purchased may contain

computer software susceptible to the Year 2000 problem. The problem could occur not only in computer software or data that have been acquired from external sources, but also in programs developed by licensees or consultants. For many licensees, this issue may not prove to be a significant health and safety concern. However, to prevent any other potential problems this issue may precipitate, licensees are encouraged to examine their uses of computer systems and software well before the turn of the century. In assessing computer software, licensees may want to consider reviewing those programs that are used to meet licensing requirements or those that have safety significance.

To facilitate the exchange of information among licensees, NRC, and the public, information related to the Year 2000 problem is posted on NRC's World Wide Web server (www.nrc.gov.) under the "News and Information" option. An example of information that has already been posted is contract language developed by the Federal government for acquisition of new information technology to avoid the Year 2000 problem. In addition to the information presented on NRC's homepage, an Internet list server has been established to encourage discussion of Year 2000 issues. To subscribe to this list, Internet e-mail may be sent to listproc@nrc.gov with the message: subscribe year-2000 username, where the username is the first and last name of the individual making the request (e.g., John Doe).

Licensees may wish to consider what actions may be appropriate to examine and evaluate their software systems, and whether to designate an individual to monitor the continuing activities in government and industry to determine the extent of potential problems and proposed solutions. Any additional contact regarding the Year 2000 problem between NRC and licensees will be made through the addressee of this information notice, unless a separate point of contact is designated by the licensee. Licensees who wish to designate a separate point of contact should provide the contact name and address, including telephone and fax number and email address if available, to the appropriate technical contact of this information notice. Holders of Title 10 of the Code of Federal Regulations (CFR) Part 50 licenses are requested to provide this information to the appropriate Office of Nuclear Reactor Regulation (NRR) project manager (courtesy copy to the NRR technical contact listed below).

This information notice requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contacts listed below or the appropriate regional office.

signed by	signed by
Donald A. Cool, Director Division of Industrial and Medical Nuclear Safety Office of Nuclear Material Safety and Safeguards	Thomas T. Martin, Director Division of Reactor Program Management Office of Nuclear Reactor Regulation

Technical contacts:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

May 11, 1998

NRC GENERIC LETTER NO. 98-01: YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS

Addressees

All holders of operating licenses for nuclear power plants, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this generic letter to require that all addressees provide the following information regarding their programs, planned or implemented, to address the year 2000 (Y2K) problem in computer systems at their facilities: (1) written confirmation of implementation of the programs and (2) written certification that the facilities are Y2K ready with regard to compliance with the terms and conditions of their licenses and NRC regulations.

Description of Circumstances

Simply stated, the Y2K computer problem pertains to the potential for date-related problems that may be experienced by a system or an application. These problems include not representing the year properly, not recognizing leap years, and improper date calculations. An example of a date-related problem is the potential misreading of "00" as the year 1900 rather than 2000. These problems can result in the inability of computer systems to function properly by providing erroneous data or failing to operate at all. The Y2K problem has the potential of interfering with the proper operation of computer systems, hardware that is microprocessor-based (embedded software), and software or databases relied upon at nuclear power plants. Consequently, the Y2K problem could result in a plant trip and subsequent complications on tracking post-shutdown plant status and recovery due to a loss of emergency data collection.

The Y2K problem is urgent because it has a fixed deadline. It requires priority attention because of the limited time remaining, the uncertain risk that the problem presents, the technical challenges presented, and the scarcity of resources available to correct the problem.

Existing reporting requirements under 10 CFR Part 21, 10 CFR 50.72, and 10 CFR 50.73 provide for notification to the NRC staff of deficiencies and non-conformances, and failures, such as some of those which could result from the Y2K problem in safety-related systems. To date, the NRC staff has not identified or received notification from licensees or vendors that a Y2K problem exists with safety-related initiation and actuation systems. However, problems have been identified in non-safety, but important, computer-based systems. Such systems, primarily databases and data collection processes necessary to satisfy license conditions, technical specifications, and NRC regulations that are date driven, may need to be modified for Y2K compliance.

Some examples of systems and computer equipment that may be affected by Y2K problems follow:

- Security computers
- Plant process (data scan, log, and alarm and safety parameter display system) computers
- Radiation monitoring systems
- Dosimeters and readers
- Plant simulators
- Engineering programs
- Communication systems
- Inventory control systems
- Surveillance and maintenance tracking systems
- Control systems

To alert nuclear power plant licensees to the Y2K problem, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the NRC staff described the potential problems that nuclear power plant computer systems and software may encounter as a result of the change to the new century and how the Y2K issue may affect NRC licensees. In IN 96-70, the NRC staff encouraged licensees to examine their uses of computer systems and software well before the turn of the century and suggested that licensees consider appropriate actions for examining and evaluating their computer systems for Y2K vulnerabilities. The NRC staff also incorporated recognition of the Y2K concern in the updated Standard Review Plan, NUREG-0800, Chapter 7, "Instrumentation and Control," dated August 1997, which contains guidance for the NRC staff's review of computer-based instrumentation and control systems.

At the Nuclear Utilities Software Management Group (NUSMG) Year 2000 Workshop, an industry workshop held in July 1997, some nuclear power plant licensees described their Y2K programs and gave examples of areas in which they had addressed Y2K issues in order to ensure the safety and operability of their plants on and after January 1, 2000. Some of the issues discussed were (1) the evaluation of the impact of the Y2K problem on plant equipment, (2) the assessment process involved in the identification of Y2K-affected components, vendors, and interfaces, (3) the development of Y2K testing strategies, and (4) the identification of budget needs to address the Y2K problem.

The Nuclear Energy Institute (NEI) met with NUSMG and nuclear plant utility representatives in August 1997 to formulate an industry-wide plan to address the Y2K issue. On October 7, 1997, representatives of NEI and NUSMG met with the NRC staff to discuss the actions NEI was taking to help utilities make their plants "Year 2000 ready." NEI presented a framework document that provides guidance for utilities to use in readying for the Year 2000. The framework document makes a distinction in terminology between "Y2K ready" and "Y2K compliant." "Y2K compliant" is defined as computer systems or applications that accurately process date/time data (including but not limited to calculating, comparing, and sequencing) from, into, and between the 20th and 21st centuries, the years 1999 and 2000, and leap-year calculations. "Y2K ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system or application is not fully Y2K compliant. (These definitions have been adopted by the NRC for purposes of this generic letter.)

NEI/NUSMG issued the framework document NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," to all licensees in November 1997. The document recommends methods for nuclear utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license. The scope of NEI/NUSMG 97-07 includes software, or software-based systems or interfaces, whose failure (due to the Y2K problem) would (1) prevent the performance of the safety function of a structure, system, or component or (2) degrade, impair, or prevent compliance with the nuclear facility license and NRC regulations.

Discussion

Diverse concerns are associated with the potential impact of the Y2K problem on nuclear power plants because of the variety and types of computer systems in use. The concerns result from licensees' reliance upon (1) software to schedule maintenance and technical specification surveillance, (2) programmable logic controllers and other commercial off-the-shelf software and hardware, (3) digital process control systems, (4) software to support facility operation, (5) digital systems for collection of operating data, and (6) digital systems to monitor post-accident plant conditions. The scope of NEI/NUSMG 97-07 includes the broad range of computers and software-based systems in a nuclear power plant. However, NRC Y2K concerns are limited to safety-related systems and other systems required by the nuclear power plant license or NRC regulations.

One application that is common to all power reactor licensees is the link between plant computers and the NRC's Emergency Response Data System (ERDS). This application performs the communication and data transmission functions that provide near real-time data availability to NRC and State incident response personnel during declared emergencies. The NRC is currently performing Y2K-related upgrades to ERDS, which will maintain the same communication protocol as the current system, with the exception that either 2-digit- or 4-digit-year fields will be accepted. Those licensees that anticipate changes to their ERDS link should allow time in their schedules for retesting their systems. NRC contractors will support requests for testing on a "first-come, first-served" basis.

NEI/NUSMG 97-07 suggests a strategy for developing and implementing a nuclear utility Y2K program. The strategy recognizes management, implementation, quality assurance (QA) measures, regulatory considerations, and documentation as the fundamental elements of a successful Y2K project. The document contains examples currently in use by licensees and also recommends that the Y2K program be administered using standard project management techniques.

The recommended components for management planning are management awareness, sponsorship, project leadership, project objectives, the project management team, the management plan, project reports, interfaces, resources, oversight, and QA. The suggested phases of implementation are awareness, initial assessment (which includes inventory, categorization, classification, prioritization, and analysis of initial assessment), detailed assessment (including vendor evaluation, utility-owned or utility-supported software evaluation, interface evaluation, and remedial planning), remediation, Y2K testing and validation, and notification.

The QA measures specified in NEI/NUSMG 97-07 apply to project management QA and implementation QA. Regulatory considerations include the performance of appropriate reviews, reporting requirements, and documentation. Documentation of Y2K program activities and results includes documentation requirements, project management documentation, vendor documentation, inventory lists, checklists for initial and detailed assessments, and record retention. NEI/NUSMG 97-07

also contains examples of various plans and checklists as appendices, which may be used or modified to meet the licensee's specific needs and/or requirements.

It should be recognized that NEI/NUSMG 97-07 is programmatic and does not fully address all the elements of a comprehensive Y2K program. In particular, augmented guidance in the area of risk management, business continuity and contingency planning, and remediation of embedded systems is needed to fully address some Y2K issues that may arise in licensee program implementation. The NRC staff believes that the guidance in NEI/NUSMG 97-07, when properly augmented and implemented, presents an example of one possible approach for licensees when addressing the Y2K problem at nuclear power plant facilities.

Another document that provides a useful overview of the elements of an effective Y2K program is a guide issued by the Accounting and Information Management Division (AIMD), U.S. General Accounting Office (GAO), GAO/AIMD-10.1.14, "Year 2000 Computing Crisis: An Assessment Guide," September 1997. This guide is a distillation of the best practices of the Government and the private sector for dealing with the Y2K problem.

It should be noted that the guidance in NEI/NUSMG 97-07 and GAO/AMID-10.1.14 provides a framework only. Any Y2K program employed at a nuclear facility must be tailored to meet the specific needs and requirements of that facility and should, in general, be composed of the following phases: awareness, assessment, remediation, validation, and implementation. Completion of the Y2K program means the attainment of the program objectives, which could range from all computer systems and applications, including embedded systems, being Y2K compliant, to some being Y2K compliant and the remaining retired or with permanent and/or temporary compensatory measures or work-arounds in place. Also to be considered are the future maintenance requirements for keeping the systems and applications Y2K ready, for example, when the "fixed date window" approach is used.

It is recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could potentially affect the facility adversely. Therefore, to ensure continued safe operation of the facility into the Year 2000 and beyond, contingency plans should be formulated for affected systems and equipment. The concept of Y2K readiness includes the planning, development, and implementation of appropriate contingency plans or compensatory actions for items that are not expected to be Y2K compliant or ready and to address the possible impact of unidentified items and their effect on safe plant operation.

Because of the limited time remaining in which to address the Y2K problem, at some facilities it may be necessary that some remediation and implementation activities be performed during normally scheduled plant outages in order to avoid additional outages to effect these activities. Hence, licensees should plan for this work accordingly. The NRC staff notes that unless the majority of the Y2K program remediation, validation, and implementation activities are completed at a facility by mid -1999, leaving only a few such activities scheduled for the third and fourth quarters of 1999, the facility may not be Y2K ready by the year 2000.

In the course of implementing the Y2K program, problems could be identified that potentially affect the licensing basis of the plants. In certain cases, license amendments may be needed to address the problem resolution. Licensees should plan to submit such license amendments to the NRC on a timely basis. The utility Y2K programs and schedules should have the flexibility to accommodate such an eventuality. In

addition, licensees are reminded that any changes to their facilities that affect their current licensing basis must be reviewed in accordance with existing NRC requirements and the change properly documented. Finally, we strongly encourage licensees to share information regarding identified remediation and implementation activities in order to maintain the likelihood that all Y2K problems are identified. We understand that Owners' Groups are implementing this and we encourage this effort.

Required Response

In order to gain the necessary assurance that addressees are effectively addressing the Y2K problem with regard to compliance with the terms and conditions of their licenses and NRC regulations, the NRC staff requires that all addressees submit a written response to this generic letter as follows:

(1) Within 90 days of the date of this generic letter, submit a written response indicating whether or not you have pursued and are continuing to pursue a Y2K program such as, or similar to, that outlined in NEI/NUSMG 97-07, augmented appropriately in the areas of risk management, contingency planning, and remediation of embedded systems. If your program significantly differs from the NEI/NUSMG guidance, present a brief description of the programs that have already been completed, are being conducted, or are planned to ensure Y2K readiness of the computer systems at your facility(ies). This response must address the program's scope, assessment process, plans for corrective actions (including testing and schedules), QA measures, contingency plans, and regulatory compliance.

(2) Upon completing your Y2K program or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready, or will be Y2K ready, by the year 2000 with regard to compliance with the terms and conditions of your license(s) and NRC regulations. If your program is incomplete as of that date, your response must contain a status report, including completion schedules, of work remaining to be done to confirm your facility is/will be Y2K ready by the year 2000.

Address the written reports to the U.S. Nuclear Regulatory Commission, Attention: Document Control Desk, Washington, D.C. 20555-0001, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act 1954, as amended, and 10 CFR 50.54(f). In addition, submit a copy to the appropriate regional administrator.

Backfit Discussion

This generic letter requires information from addressees under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). The required information will enable the staff to verify that each nuclear power plant licensee is implementing an effective plan to address the Y2K problem and provide for safe operation of the facility before January 1, 2000, and is in compliance with the terms and conditions of their license(s) and NRC regulations. The following NRC regulations form a basis for this requirement:

- 10 CFR 50.36, "Technical Specifications," paragraph (c)(3), "Surveillance Requirements," and paragraph (c) (5), "Administrative controls." These sections relate, respectively, to requirements pertaining to testing, calibration, or inspection to ensure that the necessary quality of systems and components is maintained and to provisions relating to management, procedures, recordkeeping, and review and audit necessary to ensure operation of the facility in a safe manner.

- 10 CFR 50.47, "Emergency Plans," paragraph (b)(8), which relates to the provision and maintenance of adequate emergency facilities and equipment to support the emergency responses.

- Appendix B to 10 CFR Part 50, Criterion III, "Design Control," requires that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

- Appendix B to 10 CFR Part 50, Criterion XVII, "Quality Assurance Records," requires that sufficient records shall be maintained to furnish evidence of activities affecting quality. The records are to include operating logs and the results of reviews.

- Appendix E to 10 CFR Part 50, Section VI, "Emergency Response Data System," which relates to the provision and maintenance of licensee links to the ERDS *[this citation was inadvertently omitted from the final copy of NRC Generic Letter 98-01]*.

- Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 13, "Instrumentation and Control," which addresses the provision of appropriate instrumentation and controls to monitor and control systems and variables during normal operation, anticipated operational occurrences, and accident conditions, as appropriate, to ensure adequate safety.

- Appendix A to 10 CFR Part 50, GDC 19, "Control Room," which requires the provision of a control room from which actions can be taken to operate the nuclear plant safely.

- Appendix A to 10 CFR Part 50, GDC 23, "Protection System Failure Modes," which requires that the protection system shall be designed to fail into a safe state or into a state demonstrated to be acceptable on some other defined basis.

Paperwork Reduction Act Statement

This generic letter contains information collections that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB), approval number 3150-0011, which expires on September 30, 2000.

The public reporting burden for this collection of information is estimated to average 100 hours per response, including the time for reviewing the instructions, searching data sources, gathering and maintaining the needed data, and completing and reviewing the information collected. This estimate assumes a licensee's response simply confirms the existence of a Y2K program, similar to that outlined in NEI/NUSMG 97-07, and that the program will be completed by July 1, 1999. Licensees whose Y2K program significantly differs from the NEI/NUSMG guidance or whose Y2K program will not be completed by July 1, 1999, must submit additional information to the NRC.

The NRC is seeking public comment on the potential impact of the collection of information contained in this generic letter and on the following issues:

1. Is the proposed collection of information necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?
2. Is the estimate of burden accurate?
3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?
4. How can the burden of the collection of information be minimized, including the use of automated collection techniques?

Send comments on the burden estimate and any aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, T-6 F33, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, D.C. 20503.

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

If you have any questions about this matter, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Original signed by
D. B. Matthews
FOR

Jack W. Roe, Acting Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical Contact:	M. Chiramal, NRR 301-415-2845 E-mail: mxc@nrc.gov
Lead Project Manager:	Allen G. Hansen, NRR 301-415-1390 E-Mail: agh@nrc.gov

Attachments: List of Recently Issued NRC Generic Letters

(NUDOCS Accession Number 9805050192)

UNITED STATED
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

January 14,1999

NRC GENERIC LETTER NO. 98-01 SUPPLEMENT 1: YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS

- Addressees
- Purpose
- Description of Circumstances
- Discussion
- Voluntary Response
- Backfit Discussion
- Paperwork Reduction Act Statement

Addressees

All holders of operating licenses for nuclear power plants, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose

The U. S. Nuclear Regulatory Commission (NRC) is issuing this generic letter supplement to provide addresses with a voluntary alternative response to that required in Generic Letter 98-01 on Year 2000 (Y2K) readiness of their respective facilities. This offer is consistent with the Nuclear Energy Institute's (NEI) recommendation in their letter to the NRC dated November 9, 1998. The alternative response should provide information on the overall Y2K readiness of the plant, including those systems necessary for continued plant operation which are not covered by the terms and conditions of the license and NRC regulations.

Description of Circumstances

On May 11, 1998, the NRC issued Generic Letter 98-01, requesting information regarding the licensee's programs, planned or implemented, to address the year 2000 (Y2K) problem in computer systems at their facilities. Specifically, item (2) under Required Response, requires addressees to provide a written response upon completing the Y2K program or, in any event, no later than July 1, 1999, confirming that the facility is Y2K ready, or will be ready, by the year 2000 with regard to compliance with the terms and conditions of the license and NRC regulations. For incomplete programs as of that date, the licensee is to provide a status report, including completion schedules, of work remaining to be done to confirm the facility is/will be ready by the year 2000.

Since issuance of GL 98-01, increased public awareness and government attention to the Y2K problem have resulted in concern over not only public health and safety of nuclear power plants but also concern

over the ability of nuclear power plants to continue to provide power to the national electric power grid. A key aspect of this concern is the recognition of the need for significant disclosure and sharing of information on the Y2K problem and its impact on the nation's infrastructure as described in the Year 2000 Information and Readiness Disclosure Act (Public Law No: 105-271) which was enacted on October 19, 1998. The information requested in this supplement to GL 98-01 is consistent with this Act.

Discussion

As discussed in Generic Letter 98-01, the Y2K computer problem pertains to the potential for date-related problems that may be experienced by a computer system or an application. The Y2K problem has the potential of interfering with the proper operation of computer systems, hardware that is microprocessor-based (embedded software), and software or databases relied upon at nuclear power plants. Diverse concerns are associated with the potential impact of the Y2K problem on nuclear power plants because of the variety and types of computer systems in use. The concerns result from a reliance upon (1) software to schedule maintenance and technical specification surveillance, (2) programmable logic controllers and other commercial off-the-shelf software and hardware, (3) digital process control systems, (4) software to support facility operation, (5) digital systems for collection of operating data, and (6) digital systems to monitor post-accident plant conditions.

Some examples of systems and computer equipment that may be affected by Y2K problems follow:

- Security computers
- Plant process (data scan, log, and alarm) and safety parameter display system computers
- Radiation monitoring systems
- Dosimeters and readers
- Plant simulators
- Engineering programs
- Communication systems
- Inventory control systems
- Surveillance and maintenance tracking systems
- Control systems

The NRC and the nuclear industry recognized the importance of the Y2K concern to the above systems, even though some of the systems may not be covered by specific requirements of the facility license, because of their impact on the ability of the plant to support the grid and the nation's electric power infrastructure. For this reason, the NRC will permit addressees to provide an alternative response to that identified in item (2) of GL 98-01 which addresses overall plant Y2K readiness. Addressees may still provide the more narrowly focused response required by GL 98-01 on the readiness of only those systems within the scope of the facility license and NRC regulations under the provisions of 10 CFR 50.54 (f). However, addressees are reminded that existing reporting requirements under the provisions of 10 CFR Part 21, 10 CFR 50.72, 10 CFR 50.73 and 10 CFR 50.9 are still applicable as appropriate when Y2K problems in safety-related systems are identified.

Voluntary Response

Addressees may respond to this supplement to GL 98-01 on or before July 1, 1999, in lieu of item (2) of GL 98-01 but must respond to one or the other. In responding to this supplement to GL 98-01, the addressee should confirm Y2K readiness of the facility with regard to those systems within the scope of the license and NRC regulations, and those systems required for continued operation of the facility after January 1, 2000. For those systems which are not Y2K ready as of July 1, 1999, the addressee should provide a status and completion schedule for achieving readiness by the year 2000.

Address the written response to the U.S. Nuclear Regulatory Commission, Attention: Document Control Desk, Washington, D.C. 20555-0001.

Backfit Discussion

The NRC staff has determined that the backfit rule, Section 50.109 of the Code of Federal Regulations (10 CFR 50.109), does not apply to this generic letter because it only requests information from addressees (in particular, those addressees who choose to respond to the NRC in the manner described herein, rather than in accordance with item (2) of GL 98-01) that will enable the NRC staff to confirm that a facility is Y2K ready, or will be ready, by the year 2000 with regard to complying with the terms and conditions of the facility license and NRC regulations. Therefore, no backfit analysis was prepared.

Paperwork Reduction Act Statement

This generic letter contains information collections that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB), approval number 3150-0011, which expires on September 30, 2000.

The public reporting burden for this collection of information is estimated to average 100 hours per response, including the time for reviewing the instructions, searching data sources, gathering and maintaining the needed data, and completing and reviewing the information collected. This estimate assumes a licensee's response simply confirms that the Y2K program will be completed by July 1, 1999. Licensees whose Y2K program will not be completed by July 1, 1999, must submit additional information to the NRC.

The NRC is seeking public comment on the potential impact of the collection of information contained in this generic letter and on the following issues:

1. Is the proposed collection of information necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?

2. Is the estimate of burden accurate?

3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?

4. How can the burden of the collection of information be minimized, including the use of automated collection techniques?

Send comments on the burden estimate and any aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, T-6 F33, U.S.

Nuclear Regulatory Commission, Washington, D.C. 20555-0001, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, D.C. 20503.

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

If you have any questions about this matter, please contact one of the technical contacts listed below or the appropriate office of Nuclear Reactor Regulation (NRR) project manager.

/s/'d by

David B. Matthews, Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical Contact:	Matt Chiramal, NRR 301-415-2845 E-Mail: mxc@nrc.gov
Lead Project Manager:	Allen G. Hansen, NRR 301-415-1390 E-Mail: agh@nrc.gov

Attachment: List of Recently Issued NRC Generic Letters

(NUDOCS Accession Number 9901130297)

October 2, 1998

Mr. Roger O. Anderson, Director
Nuclear Energy Engineering
Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - AUDIT REPORT ON THE YEAR 2000 PROGRAM (TAC NO. MA1858)

Dear Mr. Anderson:

On September 15-17, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Monticello Nuclear Generating Plant as a followup to NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-1392 if you have any questions or comments on the enclosed audit report.

Sincerely,

Original Signed by

Tae Kim, Senior Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosure: As stated

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION (NRR)

AUDIT REPORT

ON

IMPLEMENTATION OF GENERIC LETTER (GL) 98-01

"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket No:	50-263
License No:	DPR-22
Licensee:	Northern States Power Company (NSP)
Facility:	Monticello Nuclear Generating Plant (MNGP)
Location:	2807 West Highway 75 Monticello, MN 55362
Dates:	September 15 - 17, 1998
Audit Team Members:	Matthew Chiramal, NRR Dave Butler, Region III Deirdre Spaulding, NRR

Approved by: Jared Wermiel, Chief
Instrumentation and Controls Branch
Office of Nuclear Reactor Regulation

- Executive Summary
- Report Details
  - 1.0 Introduction
  - 2.0 MNGP Y2K Project Description
    - 2.1 Project Organization
    - 2.2 Project Plan
      - 2.2.1 Awareness
      - 2.2.2 Initial Assessment
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- Table 1 - MNGP Y2K Project Implementation Schedule
- Table 2 - Software Inventory
- Table 3 - Inventory of Safety-Related Software at MNGP.
- Table 4 - Inventory of Embedded Systems
- Table 5 - Embedded Components Reviewed by the Audit Team
- Table 6 - Safety-Related Embedded Components Identified by MNGP
- Attachment 2

Executive Summary

From September 15 through 17, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Monticello Nuclear Generating Plant in accordance with the audit plan (Attachment 1) for this activity. The purpose of the audit was to (1) assess the effectiveness of the Northern States Power Company (the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding Monticello's Y2K program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the Monticello Y2K readiness program, the following observations were made:

1. The Monticello Y2K readiness program is comprehensive and is based on the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The Monticello Y2K readiness program is receiving appropriate management support and oversight.
3. The licensee began the formal Monticello Y2K program later than most licensees (June 1998) and as a result, the licensee is still in the initial assessment stage. The licensee is undertaking an ambitious schedule in order to meet the July 1999 Y2K readiness date established by the NRC staff in GL 98-01. Despite the late start, the Y2K readiness schedule appears to be achievable because of the limited number of software items at the site, the fact that the licensee has already begun remediation of major critical computer

systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group and a utility alliance.

4. The licensee has not started the Monticello Y2K contingency planning. The licensee plans to utilize the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort. With proper attention provided by management, the licensee should be able to complete this effort by July 1999.
5. The licensee's corporate and Monticello plant-specific Y2K program interfaces are effectively addressing grid reliability and availability issues.
6. The licensee will address the operating status of Monticello, which is currently planned to be in a refueling outage on December 31, 1999, in its corporate Y2K readiness plan and associated contingency planning. Both operating and shutdown conditions for Monticello will be considered.

Report Details

1.0 Introduction

The objectives of the Monticello Nuclear Generating Plant (MNGP) Y2K Program audit were to:

1. assess the effectiveness of the Northern States Power Company (the licensee) programs for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems,
2. evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and
3. assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL 98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

Prior to the audit at the plant site, the audit team had obtained and reviewed the MNGP Year 2000 Readiness Implementation Plan and associated work instructions (draft versions of document numbers 1, 2, and 3 listed in Attachment 2).

The audit process started with an entrance meeting attended by the MNGP Year 2000 Readiness Project Manager (PM) and other site personnel, the Year 2000 PM of Prairie Island Nuclear Plant, and members of the audit team. Attachment 3 is a list of the attendees. The PM and members of the project team described the project organization, the project plan and its implementation, and the project status and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the project plan and its associated procedures, the plan implementation products (documents and data bases) and interacting with the project team members, particularly with the PM. The documents reviewed are listed in Attachment 2.

2.0 MNGP Y2K Project Description

2.1 Project Organization

The MNGP Y2K project has 15 full-time persons (including the PM and two contractors) and 3 part-time persons). The PM has overall responsibility for the project and reports to the General Superintendent - Design and Engineering, MNGP, who reports to the Monticello Site Plant Manager. The Plant Manager reports to the President-Nuclear Generations who provides the information to the Project Sponsor.

MNGP participates with other organizations that are addressing the Y2K effort. The licensee has been involved with the Boiling Water Reactor (BWR) Owners Group. According to the licensee, the BWR Owners Group final report on its Y2K program is due October 1998. MNGP has been able to take advantage of the BWR Owners Group generic Y2K efforts for several noncompliant computer systems. MNGP will be upgrading its nonsafety-related process computer system (PCS), a General Electric Company (GE) 3D Monicore Baseline 94 system. The GE 3D Monicore Baseline 98 upgrade system which is Y2K compliant is scheduled to be installed at the site in November 1998 with testing and final acceptance of the PCS occurring over a period of approximately 2 months. Other Y2K compliant upgrades being coordinated through the BWR Owners Group are the GE NUMAC automated TIP [traversing in-core probe] control units and the rod worth minimizer (RWM), and GE Fanuc reactor recirculation control and motor-generator (MG) set scoop tube positioner and

controller systems.

To further the exchange of Y2K information, MNGP is also part of a Y2K Alliance, which is composed of representatives from Point Beach, Kewaunee, Monticello, Duane Arnold, and Prairie Island nuclear power plants.

2.2 Project Plan

The MNGP Year 2000 Readiness Implementation Plan (Item 1 of documents reviewed in Attachment 2) is the plant-specific plan that was developed by the licensee and issued on July 17, 1998. It is based on the guidance provided in NEI/NUSMG 97-07, which was endorsed by the NRC in NRC GL 98-01 as guidance that when properly implemented presents one approach for achieving Y2K readiness. The audit team's review confirmed that the MNGP Year 2000 Implementation Plan is based on the guidance contained in NEI/NUSMG 97-07.

The MNGP Year 2000 Readiness Implementation Plan consists of the following phases: awareness, initial assessment, detailed assessment, remediation, contingency planning and risk management, and notification. It also includes requirements for quality assurance, regulatory considerations, and documentation.

2.2.1 Awareness

At MNGP, the formal Y2K awareness phase of the Y2K program was initiated in June 1998 to all site personnel via Site News Letters. Additionally, through various group meetings and e-mails, information on Y2K problems was disseminated to system engineers and staff during the start of the project. On September 16, 1998, the plant Year 2000 Project was discussed at the Engineering/Technical Staff Training session.

At the corporate level, Y2K awareness began in 1996. The NSP board of directors approved the NSP Year 2000 Project and its budget in 1996.

The MNGP Y2K project implementation schedule is provided in Table 1.

2.2.2 Initial Assessment

The initial assessment stage of the MNGP Y2K Project started in July 1998. The completed initial assessment will result in the identification of all software applications and embedded system components at the MNGP. The NSP Software Master Configuration Index (SMCI) was used by MNGP to identify the software applications, and the Champs database was used to aid in the identification of embedded systems. The tasks of initial assessment include (1) inventory, (2) categorization, (3) classification, (4) prioritization, and (5) analysis of the initial assessment. The licensee indicated that the inventory of all software application items and approximately 80 percent of the embedded system components was complete.

In the identification of embedded systems, it is necessary to review the procedures and documentation for occurrences of phrases that would indicate the existence of an internal clock or processor, survey the vendors for information on their equipment, perform system walk-downs, and review schematics, program listings, and reference manuals.

Table 2 provides the results of inventory of software items. Of the 290 software items identified, 120 will require assessment testing, and 60 will require additional detailed and integrated testing. Table 3 provides a list of safety-related softwares at MNGP.

Table 4 provides the results of inventory for the embedded systems. A total of 453 embedded items had been identified to date. Out of the total of 453 identified embedded items, 175 still need to be assigned a classification

Prioritization

The inventory phase includes the prioritization of the identified items. The priority is based on the criticality and risk of the functions performed. The criticality is based on the criteria as suggested by NEI/NUSMG 97-07: (1) critical (life-threatening implications, required by regulations; major impact on service to customers), (2) severe (mandated by regulatory agencies but can be lost for short periods of time; asset is used solely as a backup to an asset of critical importance; business continues but with great difficulty), (3) high (mandated by regulatory agencies but which have compensatory measures; business continues but with serious difficulty), (4) medium (minimal impact on company's core business; compensatory measures are more costly to use than the asset), (5) low (customer service is not affected; minimal impact on business operation), or (6) none (no lost productivity; asset is no longer being used or has no identified users). Risk assessment is based on the frequency of usage and type of usage and is classified as critical, high, medium, or low. Priority of high, medium, or low will be assigned commensurate with the level of importance relative to criticality and risk.

Analysis of Initial Assessment

The results of the MNGP initial assessment of the software applications and embedded items will be placed in the MNGP Y2K Application Checklist and Embedded Component Summary.

Analysis of the initial assessment is the final step in the initial assessment phase. During the analysis of the initial assessment, items are dispositioned as "not affected" or designated as needing further detailed assessment. Items that do not display a date or calculate a date

require no further evaluation and are designated as "not affected." All other items will require detailed assessment and will be dispositioned as follows: use as is, remove, replace, or remediate and test.

NRC Audit Team Assessment

Several folders for embedded components were reviewed by the audit team. The components were selected from the database print-out titled "Embedded Components Sorted by Classification [sp]" dated Tuesday, September 15, 1998, consisting of 18 pages.

Out of a total of 453 embedded components identified, a total of 32 embedded component folders were reviewed by the audit team.

159 items had a classification that needed to be determined - 24 items were selected for review
23 items were classified under "Continuity of Business" - 1 item was selected for review
126 items were classified under "Important to Operation" - 2 items were selected for review
12 items were classified under "License Commitment" - 1 item was selected for review
55 items were classified under "Non-essential" - 0 items were selected for review
12 items were classified under "Personnel Safety" - 1 item was selected for review
20 items were classified under "Required by Regulations" - 1 item was selected for review
8 items were classified under "Safety Related" - 2 items were selected for review

While reviewing the embedded component information, the audit team found that for component with ID number 427 a "low" priority was assigned. The PM indicated that a Y2K issue does not exist here because there is no date function. From its initial look at the folder in detail, the audit team determined that there seemed to be a different method for determining the priority of these components from the method that is spelled out in the NEI/NUSMG 97-07 guidance. The PM indicated that the impact evaluation grid, risk evaluation grid, and corrective action grid proposed in NEI/NUSMG 97-07 were modified and combined in the risk assessment and prioritization guidance provided in the MNGP Year 2000 Embedded Component Work Instruction (item 3 of documents reviewed in Attachment 2). The intent was to make risk assessment and priority determination easier. The PM also indicated that the determination of risk and priority also involves the engineering judgements of the evaluator, system engineer, system superintendent, and PM. The audit team considered the explanation acceptable and for components in which no date functions exist a low priority is appropriate. Table 5 provides a list of embedded components that were reviewed by the audit team. Table 6 provides information on the embedded components that MNGP classified as safety related.

2.2.3. Detailed Assessment

In the detailed assessment phase, MNGP will obtain information on each item to determine its expected performance when subjected to the NEI/NUSMG 97-07 identified problem dates. There are four different evaluations that may be carried out during the detailed assessment phase. Vendor evaluation, plant-owned or supported software evaluation, interface evaluation, and embedded components evaluation. Vendor evaluation encompasses validation testing based on the criticality of the item, prior experience with the vendor, extent of documentation, or plant knowledge of the item. Plant-owned or supported software evaluation encompasses knowledge-based decisions, scanning, and testing. When testing is proposed, test specifications and procedures are developed. Interface evaluation encompasses the review of the interface capability with software and applications that interface with other systems. Embedded components evaluation encompasses the use of knowledge-based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. Upon completion of the detailed assessment, each component found to be susceptible to the Y2K problem will be used as is, retired, replaced, or modified.

2.2.4. Y2K Testing and Validation

MNGP will perform Y2K testing in support of the evaluation efforts to determine whether the Y2K problem is present. Testing is performed during detailed assessments and requires the development of test procedures. Y2K testing will also be performed subsequent to remediation to determine whether those efforts have eliminated the Y2K problem and no unintended functions are introduced.

MNGP will perform assessment testing per computer problem/change reports (PCRs) and associated verification and validation (V&V) plans and test procedures that they currently have or will establish. Assessment testing will be handled as follows: The test procedures will be written as the application or process software is received and evaluated. A generic test procedure has been prepared which is being used as the starting point. It consists of 16 various categories for Y2K evaluation and testing. Some test procedures, such as those for the security computer and equipment database, are currently being developed from the generic test procedure. This assessment testing process is expected to continue through January 1999.

MNGP will perform testing subsequent to remediation consisting of unit testing, integration testing, and system testing. Unit testing focuses on a single application, software module, or component. Integration testing examines the integration of related software modules, applications, and components. System testing examines the hardware and software components of the system as a whole.

MNGP will perform validation to confirm that the software is capable of performing its intended function. Validation is performed subsequent to remediation and Y2K testing. Upon satisfactory validation, certification and documentation will indicate "Y2K Ready" or "Y2K Compliant" depending on the remediation that was implemented.

2.2.5. Remediation or Replacement

Remediation or replacement will be performed per PCRs and associated V&V plans. A review of the SMCI for final disposition will also be performed. The purpose of remediation is to properly disposition items identified in the detailed assessment. MNGP is revising its existing "Computer & Information Systems - Problem/Change Report" (item 6 of documents reviewed) for software applications, and "Condition Report Process," (item 5 of documents reviewed) for embedded systems. These two documents ensure that identified items are properly tracked and dispositioned.

2.2.6. Regulatory Considerations

The MNGP Year 2000 Readiness Implementation Plan and associated documents (items 1, 2, 3, and 4 of documents reviewed) include references to existing plant procedures that have guidance on regulatory considerations, such as 10 CFR 50.59 reviews, and reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.7. Contingency Planning

MNGP has not begun contingency planning; however, in January 1999 MNGP will begin its contingency planning in accordance with NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."

2.2.8. Y2K Program Management

With regard to the MNGP schedule, there are activities that need to be completed by individuals at the NSP corporate level beyond the control of the MNGP Y2K team. Thus, when making the determination whether the MNGP Y2K project is on schedule, the audit team evaluated the interaction of the MNGP Y2K project management with the NSP Y2K corporate Y2K program.

2.2.9. Electric Grid Issues

MNGP is addressing the issue of substation equipment in the following manner. There appeared to be some questions as to where the boundaries of responsibility for review of substation equipment reside. The boundary between NSP generation and the new independent transmission company is not clearly defined with regard to the issue of Y2K readiness of the substation equipment. Some of the MNGP equipment resides in the substation, and because of this, the question of who should perform the Y2K assessment is not yet resolved. The equipment in question includes metering and relaying equipment. The corporate level bi-weekly project team meeting, which includes MNGP Y2K project management, is addressing this issue.

3.0 Audit Team Findings

The following six observations were made by the audit team of the MNGP Y2K project:

1. The licensee's MNGP Year 2000 Readiness Implementation Plan is a comprehensive document and is based on the guidance contained in NEI/NUSMG 97-07 with additional plant-specific procedures for evaluation of computer software and embedded software. The plan and associated procedures make use of existing plant procedures for software configuration control, software quality assurance (QA), software V&V, and change reporting. The plan is implemented through a project team consisting of a PM and technical specialists. The assessment and evaluation process requires the interaction of a cross-section of the plant organization.
2. The MNGP Year 2000 Readiness Project has the support of a senior management sponsor. At present, communication of the progress of the project to senior management is through a project tracking report. Once the project's initial assessment is completed (scheduled for November 1998), bi-monthly project status meetings with NSP corporate senior management are planned.
3. The audit team was under the impression that all nuclear power plant licensees had started their facility-specific Y2K program by early 1998 because NEI/NUSMG 97-07 was provided to senior utility management in November 1997. The MNGP Year 2000 Readiness Project was formally started in June 1998 and incorporated into the NSP corporate Y2K program at that time. The licensee was aware of the Y2K problem in late 1996 and had initiated an ad-hoc evaluation of some MNGP computer systems (e.g., plant process computer, plant security computer, and the turbine electronic pressure regulator) in 1997. The MNGP project is at the initial assessment stage now which is expected to be completed by October/November 1998. The overall MNGP Y2K project is scheduled to be completed by July 1999 with readiness achieved at that time. The audit team considers the schedule to be an ambitious one. However, the licensee appears to be able to meet the project schedule since (1) the number of software items at the site that are to be assessed for Y2K vulnerabilities (290 software items and around 500 embedded components per initial inventory) is not large, and (2) the licensee appears to have already identified and begun upgrades to major critical computer systems and components for Y2K compliance/readiness, and (3) licensee participation in BWR Owners Group and utility alliance efforts is permitting a more rapid assessment and remediation of systems and equipment because of information sharing than if the licensee had to proceed on its own. The audit team notes that detailed assessment, including some testing and remediation, and subsequent associated testing of some remaining critical systems and components are major tasks yet to be done.
4. The audit team had planned to review the outline of the licensee's Y2K contingency plan for MNGP. However, the licensee has not

as yet started on the plant Y2K contingency plan. The projected start date for MNGP Year 2000 Contingency Plan is January 1999. The Y2K PM stated that the contingency plan will be based on the guidance in NEI/NUSMG 98-07 and initiated in parallel with the detailed assessment efforts of the overall MNGP Y2K project. The audit team pointed out that a single point-of-contact for contingency planning has not been identified in the existing project team. The audit team believes that completion of the detailed Y2K contingency plans at MNGP can be achieved by July 1999 with the necessary attention provided by the Y2K PM and senior management.

5. NSP corporate efforts and interfaces with its generation Y2K projects, including MNGP and Prairie Island Y2K projects, are good for addressing electrical grid reliability and availability issues . The audit team notes that the biweekly project team meeting is a good vehicle for identifying and assigning responsibilities for interface items that might affect plant operations and grid concerns such as the substation equipment issue noted above.
6. According to the licensee's present plan, MNGP is to be shut down for reactor refueling in December 1999. However, there is a possibility that the unit may continue to operate during the December 31, 1999 - January 1, 2000, roll-over period. The NSP corporate Y2K program and MNGP Year 2000 Readiness Implementation Plan and associated contingency plans will consider both MNGP operating conditions.

Date: October 1998

Table 1	MNGP Y2K Project Implementation Schedule
Table 2	Software Inventory
Table 3	Inventory of Safety-Related Software at MNGP
Table 4	Inventory of Embedded Systems
Table 5	Embedded Components Reviewed by the Audit Team
Table 6	Safety-Related Embedded Components Identified by MNGP
Attachment 1	Y2K Readiness Audit Plan (is not provided here)
Attachment 2	Documents Reviewed
Attachment 3	Entrance Meeting - Attendees

Table 1 - MNGP Y2K Project Implementation Schedule

Activity	Starting date	Finishing date
Awareness	June 1998*	September 16, 1998**
Initial assessment	July 1998	December 1998
Detailed assessment	November 1998	March 1999
Testing/Validation	December 1998	June 1999
Remediation	December 1998	June 1999
Contingency planning	January 1999	

* A limited awareness effort began with the receipt and review of NRC Information Notice 96-70 in December 1996.

** The MNGP personnel will be kept informed of the Y2K readiness project status through the Site News Letters.

Table 2 - Software Inventory

	Total	High criticality*	Safety related**	Augmented	Standard
Software items	290	30	18	39	233

* High criticality software systems are those that perform mission critical functions including safety-related systems performing direct safety functions and those nonsafety-related systems required for plant operation.

** Table 3 lists the inventory of safety-related software at MNGP.

Table 3 - Inventory of Safety-Related Software at MNGP.

No.	Software ID	Function
1	ARCON 96	Calculates relative concentrations in plumes from control room air intakes
2	BLOCKAGE 2.5	Predicts whether accumulation of debris on torus suction strainer leads to loss of ECCS
3	CBATR	Compartment bulk air temperature transfer calculation model - used for temperature response for station blackout and equipment qualification
4	GOTHIC	Thermal hydraulic information for containment -HELB [high-energy line break] analysis for equipment qualification
5	MPM Voltage	Motor power monitor - collect and analyze 3-phase motor current
6	NPLATE	Base plate analysis program
7	PIPEPLUS	Calculates piping deflections, stresses, support loads
8	PPPS	EPRI prediction program for MOV [motor-operated valve] thrust
9	STARDYNE	Structural analysis program
10	A-FAULT	ANSI fault analysis program
11	AOVDB	Air-operated valve predictive maintenance
12	DAPPER/300	Performs analysis of 3-phase AC power load flow, voltage, fault current
13	MMOV	Support MOV program
14	PACKING NFORC	MOV diagnostic software
15	RISC	Shielding, isotopic/decay heat and nuclear criticality calculations
16	STAD III DETERMINE	Finite element structural analysis
17	THRUST PACK DATA	Provide detailed MOV spring pack data
18	VOTES	MOV diagnostic software

None of the safety-related software identified to date performs a direct safety function. The above systems provide support or auxiliary functions to safety-related systems. They do not have real-time functions.

Table 4 - Inventory of Embedded Systems

	Total	**Safety related**	**Augmented**	**Standard**	**Important to Safety**	**Required by regulations**
Embedded Items	**453**	**8**				**20**

		Required by license commitments	**Important to operation**	**Personnel safety**	**Continuity of business**	**Non-essential**
Embedded Items		12	127	12	35	55

Table 5 - Embedded Components Reviewed by the Audit Team

Classification	**Instrument name (V-Vendor)**	**System**	**Mission critical**	**Date function**	**Y2K status and note if to be tested**
To be determined (TBD)*	EPR Pressure Control V - GE Fanuc	TRB (turbine)	TBD	No	Not applicable since no date function (N/A)

TBD	Digital Feedwater Level Control V - Autech Data Systems	RFC (recirc flow control)	TBD	Unknown	Unknown
TBD	Main Steam Radiation Channel A V - GE	PRM	TBD	Unknown	Unknown To be tested
TBD	RFC B Programmable Controller V - GE Fanuc	RFC	TBD	Unknown	Unknown
TBD	Rod Worth Minimizer V - GE NUMAC	RWM	TBD	No	N/A
TBD	FW A Flow to Level Control	RLC	TBD	Unknown	Unknown
TBD	FW B Flow to Level Control	RLC	TBD	Unknown	Unknown
TBD	RFC A Genius Digital I/O Module	RFC	TBD	Unknown	Unknown
TBD	RFC A Genius Relay Output Module	RFC	TBD	Unknown	Unknown
TBD	RFC A Genius Digital I/O Module	RFC	TBD	Unknown	Unknown
TBD	RFC B Genius Digital I/O Module	RFC	TBD	Unknown	Unknown
TBD	RFC B Genius Relay Output Module	RFC	TBD	Unknown	Unknown
TBD	RFC B Genius Digital I/O Module	RFC	TBD	Unknown	Unknown
TBD	Transmation		TBD	None	Unknown
TBD	Transmation		TBD	Unknown	Unknown
TBD	RFC A Genius Analog Module	RFC	TBD	Yes	Unknown
TBD	RFC A Genius Analog Module	RFC	TBD	Yes	Unknown
TBD	RFC B Genius Analog Module	RFC	TBD	Yes	Unknown
TBD	RFC B Genius Analog Module	RFC	TBD	Yes	Unknown
TBD	Recirc MG A Scoop Tube Position	RFC	TBD	Unknown	Unknown
TBD	Recirc MG B Scoop Tube Position	RFC	TBD	Unknown	Unknown
TBD	Recirc MG B Scoop Tube Position	RFC	TBD	Unknown	Unknown
TBD	Recirc MG A Scoop Tube Position	RFC	TBD	Unknown	Unknown
TBD	RFC A Adjustable Speed Drive	RFC	TBD	Unknown	Unknown
TBD	RFC B Adjustable Speed Drive	RFC	TBD	Unknown	Unknown

Continuity of business	#11 Recirc Flow Control	RFC	Critical	No	Ready
Important to operation	#12 RFP Recirc Flow Control	CFW	Critical	None	Not affected
Important to operation	Vessel Level (Feedwater) Master Controller	RLC	Severe	None	Not affected
License commitment	SRS Controller	Chemistry	High	None	Not affected
Personnel safety	Personnel Contamination Monitor	Rad Protection	Medium	Yes	Unknown
Required by regulations	Automated TIP Control Unit 3	TIP	Critical	Yes	
Safety related	EFT Temperature Control	EFT	Critical	None	Not affected
Safety related	Div I 120 VAC Class 1E Inverter	UPS	Critical	None	Not affected
* Items that have not been classified have not been assessed and the data in the folders is preliminary.					

Table 6 - Safety-Related Embedded Components Identified by MNGP

Instrument Name	System	Mission Critical	Date Function	Y2K Status
EFT Temperature Control	EFT	Critical	None	N/A
EFT Temperature Control	EFT	Critical	None	N/A
Reactor Vessel Skin Temperature	RPV	Critical	None	N/A
SRV Tailpipe Temperature	MST	Critical	None	N/A
CGCS "A" Pressure Temperature Indicator	CGCS	Critical	None	N/A
CGCS "B" Pressures Temperature Indicator	CGCS	Critical	None	N/A
Div I 120 VAC Class 1E Inverter	UPS	Critical	None	N/A
Div II 120 VAC Class 1E Inverter	UPS	Critical	None	N/A

MNGP has not identified to date any safety-related embedded system susceptible to the Y2K problem.

Attachment 1 - Y2K Readiness Audit Plan (is not provided here)

Attachment 2

Documents Reviewed

1. MNGP Year 2000 Readiness Implementation Plan, Revision 0, July 17, 1998

2. MNGP Year 2000 Assessment - Computer Work Instruction, CWI-05.01, Revision 0, July 21, 1998

3. MNGP Year 2000 Embedded Component Project Work Instruction, PWI-Y2K-2.01, Revision 0, July 30, 1998

4. MNGP Software Quality assurance Requirements, 4AWI-08.03.03, Revision 3, January 29,1998

5. MNGP Condition Report Process, 4AWI-10.01.03, Revision 7, December 16, 1997

6. MNGP Computer Problem/Change Report (PCR), CWI-02.03, Revision 3, September 10, 1998

7. MNGP Software Verification and Validation - Computer Work Instruction, CWI-04.05, Revision 1, January 30, 1992

8. MNGP QA Records Control, 4AWI-02.10.01, Revision 3, July 12, 1996

Attachment 3

Entrance Meeting - Attendees

September 15, 1998

Dave Butler	NRC RIII
John Grubb	Gen. Supt. NGS
Deirdre Spaulding	Elec. Engr. NRC/NRR/HICB
Matthew Chiramal	NRR/NRC
Gene Heupel .	Process Leader - Eng
Ronald Siepel	Y2K Project Manager - Monticello
Roger Oelschlager	Y2K Project Manager - Prairie Island
Peggy Anderson	Y2K
Jack Thorson	Y2K Embedded
Sam Shirey	Licensing
Russ Van Dell	NSP - Computer & Info System
Mike Hippe	Production Engineer

November 6, 1998

Mr. Ted C. Feigenbaum
Executive Vice President and
Chief Nuclear Officer
North Atlantic Energy Service Corporation
c/o Mr. Terry L. Harpster
P.O. Box 300
Seabrook, NH 03874

SUBJECT: AUDIT REPORT ON IMPLEMENTATION OF GENERIC LETTER 98-01, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS" FOR SEABROOK STATION, UNIT NO. 1 (TAC NO. MA1887)

Dear Mr. Feigenbaum:

The enclosed report includes the results of the subject audit conducted by NRC staff at the Seabrook Station from September 29, 1998, through October 1, 1998. The purpose of the audit was to assess the effectiveness of the Year 2000 (Y2K) program at Seabrook, to evaluate the implementation schedule in accordance with Generic Letter (GL) 98-01, and to assess the contingency plans that address potential Y2K problems.

The audit team found the Seabrook Millennium Project Plan, which addresses the Y2K readiness program, to be well-structured and readily useable. In addition, the test procedure developed by Seabrook for identifying and correcting potential Y2K problems appeared thorough. During the audit, the team identified an inconsistency in the application of certain classifications. However, your staff was already aware of the inconsistency and had already started to resolve the issue. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. If you have any questions regarding the attached report, please contact me at (301) 415-3199.

Sincerely,

John Harrison, Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No.: 50-443

Enclosure: Y2K Audit Report

Attachment: As stated

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION (NRR)
AUDIT REPORT
ON
IMPLEMENTATION OF GENERIC LETTER (GL) 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-443
License No:	NPF-86
Licensee:	North Atlantic Energy Services Corporation
Facility:	Seabrook Unit 1
Location:	Seabrook, NH 13 Miles South of Portsmouth, NH
Dates:	September 27 - October 1, 1998
Audit Team Members:	Matthew Chiramal, NRR William Ruland, Region I Deirdre Spaulding, NRR

Approved by: Jared Wermiel, Chief
Instrumentation and Controls Branch
Office of Nuclear Reactor Regulation

- Executive Summary
- 1.0 Introduction
- 2.0 Seabrook Project Description
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  - 2.2 Project Plan
    - 2.2.1 Awareness
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    - 2.2.3 Detailed Assessment
    - 2.2.4 Y2K Testing and Validation
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Executive Summary

From September 29 through October 1, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Seabrook Nuclear Generating Station in accordance with the audit plan for this activity. The purpose of the audit was to (1) assess the effectiveness of the North Atlantic Energy Services Corporation (the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding Seabrook's Millennium Project Plan (Seabrook Y2K readiness program) and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the audit team's assessment and evaluation of the Seabrook Y2K readiness program, the following observations were made:

1. The Seabrook Millennium Project Plan, Revision 3.0, incorporates several items that reflect an increased understanding of Y2K issues that were identified through project self assessments, oversight, and audits since Revision 2 was issued in August 1998.
2. The Seabrook Millennium Project Plan is based on the guidance of NEI/NUSMG 97-07 and NRC Generic Letter 98-01 and is well-structured and readily useable.
3. The evaluation performed by the station project staff in completing the analysis of items is considered to be consistent with the Seabrook Millennium Project Plan. The Seabrook Millennium Project is planned to be completed by July 1999, with the primary exception of the modified Radiation Data Monitor System which is scheduled for installation in the 4th quarter of 1999. The licensee and audit team identified an inconsistency in classification of items in the plan which is being corrected.
4. The Seabrook project is in the remediation phase. The test procedure developed by Seabrook for identifying the Y2K problem and for verifying remediated software and embedded systems is a thorough, detailed procedure that would adequately identify Y2K problems and aid in identifying and correcting the root cause of the problem.
5. The Seabrook Millennium Project Plan Revision 3.0 includes the Contingency Plan based on the guidance in NEI/NUSMG 98-07. The implementation of the plan is scheduled to start in November 1998.
6. The Seabrook Y2K plan is being coordinated with Independent System Operators New England in order to address electric power

supply system availability concerns.

1.0 Introduction

The objectives of the Seabrook Nuclear Generating Station (Seabrook) Y2K Program Audit were to:

1. Assess the effectiveness of the North Atlantic Energy Services Corporation (the licensee) program for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems.
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999.
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL-98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

Prior to the audit at the plant site, the audit team reviewed the Seabrook Millennium Project Plan, Revision 2.0. Upon commencement of the audit, a copy of the Seabrook Millennium Project Plan Revision 3.0 was made available by the licensee for review during the audit. Attachment 1 is a list of documents reviewed by the audit team.

The audit process started with an entrance meeting attended by the Seabrook Y2K Sponsor and Y2K Project Manager, other plant personnel, and members of the audit team. Attachment 2 is a list of the attendees. Members of the Seabrook Y2K organization described the project organization, the project plan, implementation, and the current status.

Subsequent to the entrance meeting, the audit team reviewed the Seabrook Millennium Project Plan, associated project documentation, and communicated with the Seabrook Millennium personnel on an on-going basis to resolve questions as they arose.

2.0 Seabrook Project Description

2.1 Project Organization

The Seabrook Millennium Project Plan organization consists of the following roles: (1) an Executive Sponsor, who is responsible for strategic project guidance, approval and executive support, (2) a Y2K Sponsor, who is responsible for providing overall guidance and approval on the budget, resources, progress and results, (3) a Y2K Project Manager, who is responsible for the overall success of the project, including development of the implementation plan, supervising the project team and providing leadership on millennium issues to all station departments, (4) a Y2K project team consisting of the Seabrook Station personnel performing activities related to the millennium effort, (5) the software, hardware, and embedded system sponsors; who have primary responsibility for the operation of the item, typically the principal user of the item, and is held accountable for the performance of the item, (6) the software, hardware, embedded system maintainers who have primary responsibility for the maintenance of the item, and the completion of millennium-related tasks, including any remediation, testing and validation, and implementation, (7) the millennium project steering committee, (8) the joint owner audit committee, (9) a contingency plan coordinator who is assigned to facilitate and coordinate the millennium contingency planning effort, (10) the contingency planning team, and (11) a contingency plan technical lead.

The Seabrook licensee participates in group activities related to the Y2K effort with other organizations as follows: NUSMG and NEI, Northeast Energy Alliance (NEA), EPRI, Independent System Operators (ISO) New England, Sorrento Owners Group, and Westinghouse Owners Group (WOG). The Seabrook licensee will use documentation and test plans from the WOG as they are made available to evaluate Y2K readiness or compliance of identified items within the WOG scope. Additionally, the licensee is engaged in bench-marking and peer review activities with other plants as the opportunity is available. The Seabrook licensee and Florida Power and Light (FP&L) engaged in a bench-marking and peer review activity in June 1998 and established an information exchange to explore the manner in which the Y2K problem was and is being addressed at their plant sites. This type of bench-marking and peer review interface will be scheduled with other utilities as the opportunity occurs.

2.2 Project Plan

The Seabrook Millennium Project Plan, Revision 3.0, dated September 25, 1998 is the plant specific Y2K readiness plan developed by the licensee. The goal of the Seabrook Millennium Project is to ensure that the station is Y2K ready by July 1999. The Seabrook Millennium Project began in October 1996. Revision 0 of the Project Plan was issued in the spring of 1997. The Seabrook plan is similar to the NEI/NUSMG 97-07 Nuclear Utility Year 2000 Readiness guidance which was published in the Fall of 1997. The audit team's review found that the Seabrook Millennium Project Plan encompasses the guidance in the NEI/NUSMG 97-07, although some differences in activity names/terms exist.

The Implementation Plan of the Seabrook Millennium Project Plan includes the process for awareness, inventory, assessment, remediation, testing, validation, documentation and signoff of items. The plan includes a change management process that allows new items to be added to the inventory, while existing items, plans, strategies and impacts can be re-evaluated and modified if necessary.

2.2.1 Awareness

The awareness activities are included in the section entitled "Communication Plan," in the Seabrook Millennium Project Plan. The formal Y2K awareness phase of the Y2K program at Seabrook began in 1997. The Y2K problem was brought to the attention of the entire plant via "Seabrook Today," a newsletter published by North Atlantic Communications, and distributed October 23, 1997. Communication and awareness is maintained at all levels throughout the plant. The communication mode and information is tailored to the specific site audience. Seabrook's Millennium Communication Plan is intended to ensure that appropriate plant personnel are aware of the Y2K problem and take suitable action. The Seabrook licensee uses "communication deliverables" to foster participation and awareness. The following communication deliverables are tailored for their specific audience: project plan revisions, project status reports, millennium item owners and maintainers communication, internal millennium articles, millennium posters and banners, awareness sessions/presentations, and one-on-one meetings. The audit team reviewed the Seabrook Millennium Communication Matrix which identifies the various audiences and the corresponding awareness communication(s).

The Seabrook Y2K Readiness schedule is provided in Table 1.

2.2.2 Initial Assessment

What the NEI/NUSMG 97-07 guidance indicates as initial assessment which includes the inventory, categorization, classification, prioritization, and analysis of the initial assessment, is described in Seabrook's readiness plan in Section 4.1 Inventory. In Seabrook's readiness plan, the inventory activities include inventory scope, categorization, classification, and inventory signoff.

The inventory identifies all software items and embedded systems potentially affected by the Y2K problem. Additionally, because embedded systems are particularly difficult to inventory, the Seabrook project team took added care to ensure that all potentially affected embedded systems and firmware items were included in the inventory. The embedded system inventory was handled by the Seabrook Station Technical Support Department Engineers. Since most of the staff had been at Seabrook since the plant's design phase, there was a great deal of historical knowledge on station systems, procedures, programs, manuals and other documentation pertaining to embedded systems to draw upon. Identification of the embedded systems encompassed system reviews, EPRI database searches and vendor contacts, internal and external comparisons of inventory data, and knowledge-based decisions.

The inventory phase at Seabrook was completed in August 1998.

2.2.3 Detailed Assessment

Detailed assessment results are used to make decisions regarding activities required to ensure the continued operation of the software. Seabrook's readiness plan Section 4.2 Assessment, includes the analysis activity which encompass failure impact, Y2K status and strategy, and the activities of planning and assessment phase signoff.

Y2K classification at Seabrook is based upon "failure impact" analysis. Failure impact classification is defined as follows:

- Safety Implication - Important to safety of personnel and the public, safety-related controls, performs design basis calculation on nuclear safety- related structures, systems and components, process monitoring used as the basis for operational actions which prevent the release of radioactive material to the environment, and safety-related direct impact.
- Plant Trip - Affects the plant's ability to stay on-line.
- Generation Reduction - Impacts level of power generation.
- Regulatory Requirement - Required by regulators, pertains to a license commitment.
- Business Critical - Important to continuity of business, major impact on service to customers, could result in lost productivity to the majority of employees.
- Minimum Impact - Minimal impact to business, services not affected, loss of productivity to some employees.

- No impact - Non-essential, no impact to business operations, no lost productivity.

The Y2K status of systems is identified as: non-compliant, compliant, in-process, validated, eliminated, or unknown. The plan notes that for vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on failure impact, extent of documentation provided, confidence in the vendor, and Seabrook's knowledge and experience with the product.

Once Y2K status is determined, the strategies to achieve compliance or readiness is determined. Strategies identified in the Seabrook Millennium Project Plan are: eliminate, fix, replace, or accept as is. Table 2 provides the inventory of items. Of the 1304 items identified, the Seabrook licensee identified 12 that were found to have safety implications, 13 to have implications with respect to plant trip, 160 were found to be required by regulations or license, and 800 were found to be significant to business. Table 3 provides the inventory assessment.

One item of the 12 classified as Safety Implication, the Reactor Vessel Level Indication System (RVLIS), is required by technical specifications (post accident monitoring) and performs high energy line break (HELB) isolation of auxiliary steam, steam blowdown and letdown upon detection of a high temperature condition in the auxiliary building. RVLIS has been identified as not Y2K compliant and is being remediated as part of the WOG Y2K effort. In addition to the testing done by Westinghouse, the licensee plans to do additional testing of the remediated RVLIS at the site.

The folders of items reviewed by the Audit Team are listed in Tables 4, 5, 6, and 7. The team reviewed 10 items that had safety implications, 5 that impact generation reduction, 9 that impact plant trip, and 10 that have regulatory impact. (Note: The classification in these tables is defined in Seabrook's North Atlantic Information Manual (NAIM). The NAIM, Revision 4 is effective October 1, 1998. In this revision, the classification values (grading) change. All items added to the millennium inventory on or after 10/1/98 will use the new software classification values. All items in the millennium database prior to 10/1/98 do not need to be reclassified in the millennium database. Valid values prior to 10/1/98 are: safety critical, mission critical, and non-rated. Valid values 10/1/98 or later are: Level A1, Level A2, Level B, Level C, Level D).

2.2.4 Y2K Testing and Validation

Testing and validation is performed by the maintainer to ensure that the item is either Y2K ready or compliant. Existing station programs are used for testing. For embedded systems, work requests are written to track and document all testing performed. If there are multiple occurrences of an item that is being tested, for example in spare parts, then these items are to be flagged and tracked for testing prior to anticipated failure dates. Depending on the item, Y2K testing may be performed at multiple levels: unit testing which focuses on functionality and compliance testing of a single item; interface testing to determine the ability to process Y2K data from one item to another; and integration testing of the platforms on which the item operates. Documentation requirements for testing/validation includes indication if testing was performed and if not, why. If testing is performed, the test plan checklist is used to ensure appropriate testing is performed. The test plan checklist includes a review of the following tests: rollovers, high risk dates, leap year, sorting and comparisons, calculations, and interfaces. Testing should ensure that an item is Y2K ready and that no new problems are introduced. Testing is performed in accordance with a Technical Support Group Instruction (TSGI). The audit team reviewed TSGI-13 for general software testing and a draft version of TSGI-14 on embedded systems testing (documents 2 and 3 of Attachment 1) and witnessed two bench tests of components that utilized TSGI-14 guidance.

2.2.5 Remediation

The purpose of remediation is to replace, fix, or eliminate items identified in the assessment as non Y2K compliant. Remediation includes activities that make the item Y2K compliant or ready. Software-based system changes are made in accordance with the NAIM which defines the Software Quality Assurance Program. In the documentation of the remediation of an item, if the item interfaces with other systems, the maintainer identifies the system interfaces so that arrangements can be made for interface testing and scheduling.

2.2.6. Regulatory Considerations

In implementing the Seabrook Millennium Project Plan the licensee makes use of existing programs and policies to ensure that appropriate reviews and evaluations are performed and documented for regulatory compliance. These reviews and evaluations encompass 10 CFR 50.59 reviews, reportability evaluations per 10 CFR 50.72, 50.73 and 10 CFR Part 21, and operability determinations as required by technical specifications.

2.2.7 Contingency Planning

The Seabrook licensee's contingency plan addresses Y2K contingency planning management, contingency planning remediation risks, contingency planning internal facility risks, contingency planning external risks, and an integrated millennium contingency plan. The steps that Seabrook will take in contingency planning include risk identification, event analysis, risk management, and verification.

Individual contingency plans are prepared for items, systems, or events as identified in the Seabrook guidance. Contingency planning remediation risks include risk identification (identified by the maintainer during the remediation and testing and validation phases of the project), event analysis (performed at the initial remediation phase to understand the nature of the challenges to the selected remediation strategy), risk analysis, and verification. The purpose of the internal risk contingency is to anticipate and prepare for events that could occur due to system failures and reduce their impact on safe operations. Contingency planning external risks covers the means for mitigation of external millennium events that could compromise safety or continued operation of Seabrook station. One of the external risks to be considered is transmission/distribution system events. Concerns addressed include loss of off-site power, grid instability and voltage fluctuation, load fluctuations and loss of grid control systems. This contingency planning effort included information exchanges with the appropriate Independent System Operators (ISO) New England subcommittees with grid control responsibilities.

The contingency plan project organization at Seabrook includes a Contingency Plan Coordinator, and a cross-matrix Contingency Planning Team led by a Contingency Plan Technical Lead. The implementation of the plan is scheduled to start in the later part of 1998. The audit team met with the Technical Lead and members of the Contingency Planning Team and was given an outline of the contingency planning implementation process. The process would start with the systems, components and procedures for safe shutdown of the plant and expand to consider systems and procedures for safe continued operation, and, finally include systems and interfaces beyond the station boundary.

2.2.8. Y2K Program Management

The Seabrook Y2K program management plan establishes, organizes, manages, and integrates the diversity of activities required to address Y2K readiness. The Y2K readiness activities are covered in the three management areas of risk management, contingency planning, and project internal controls.

Project milestones completed include: development of the communications and awareness plan, the inventory (complete identification and analysis), schedule defined for implementation of corrective actions, and Seabrook Millennium Project Plan Revision 3. Key performance indicators (metrics that measure performance against established goals for each phase of the implementation plan) are used to measure project performance and serve as the basis for monthly reports and appropriate actions to be taken to ensure project schedules are met. To date the established schedules have been met.

The Y2K readiness project is planned to be completed by July 1999, with the primary exception of the Radiation Data Monitor System testing (for either the replacement Y2K compliant system or the remediated system), and its interface testing with system components and the Main Plant Computer. This is scheduled for the fall of 1999.

Methods of oversight of the project include management reviews, self assessments and surveillances, and internal and external audits.

2.2.9 Electrical Grid Issues

ISO New England has a Year 2000 subcommittee and several subcommittees established to exchange Y2K information, create procedures for testing and remediation, and prepare compliance assurance statements. The ISO New England Coordinator in the Seabrook Millennium Project organization is the person responsible for monitoring the status of the ISO efforts through the Generation Subcommittee.

The audit team met with the ISO New England Coordinator assigned to the project. He described the activities that have been initiated and planned in the ISO New England organization regarding the Y2K problem as it affects the electric power supply system. The interchange of information between the Seabrook licensee and ISO New England has just begun.

Electrical grid issues are also being addressed in Seabrook's contingency planning for external risks. As indicated in the discussion above, issues pertaining to electric grid availability will be evaluated and planned for in the Seabrook Y2K contingency plan.

3.0 Audit Team Observations

The audit team developed the following observations:

1. The Seabrook Millennium Project Plan, Revision 3.0, incorporates several items that were being used by the project team members but were not included in Revision 2.0 of the plan, such as the project test plan checklist and project vendor readiness questionnaire. The changes were the result of items identified through project self assessments, oversight and internal audits performed since Revision 2.0 was issued in August 1998. Revision 3.0 also contains the Contingency Plan.

Revision 3.0 includes a list of documents related to existing station programs and policies for performing the activities and QA measures related to the Y2K problem. The audit team pointed out to the project sponsor and project manager that the guidance on the use of existing station programs and policies appears to be very general and the appropriate use of the documents for specific activities (e.g., activities related to design changes to software, hardware, or embedded firmware) are left to the individual. The project sponsor stated that additional training has been provided to all station staff working on Y2K related activities on the use of existing procedures. Additionally, the majority of the staff at the Seabrook Station has been working in the same technical area since the startup of the station and are well-versed in applying existing procedures and policies to change processes and adverse condition report activities in their area of responsibility.

2. The Seabrook Millennium Project Plan is based on the guidance in NEI/NUSMG 97-07 and NRC Generic Letter 98-01. The method for classifying an item was simplified and failure impact is used to classify items in the inventory or analysis phase.
   Based on the review and evaluation by the audit team of the plan and its implementation up to the analysis phase, the Seabrook Millennium Project Plan is considered to be well-structured and readily usable. The revisions to the plan are based on the lessons learned and feedback obtained in the use of the plan by the project team members and audit teams.
3. Based on the audit team's review and evaluation of the results of the Y2K readiness project to date, the audit team considers the evaluation done by the station project staff in completing the analysis of items in the inventory to be consistent with the Seabrook Millennium Project Plan. The Seabrook Millennium Project is planned to be completed by July 1999, with the primary exception of the Radiation Data Monitor System discussed in item 7 below.
   The audit team identified an inconsistency in how the application of classification as defined in the plan was applied to certain items that were not susceptible to the Y2K problem. The use of failure impact in classifying an item is not dependent on whether an item is affected by the Y2K problem or not. The project manager and team were already aware of this inconsistency since it was identified by an earlier audit and the entire inventory was being re-classified to correct the errors in classification. Additionally, the project staff had been given additional training in this area.
4. The detailed assessment phase includes both analysis and planning. Analysis includes classification based on failure impact, millennium status and strategies to achieve Y2K readiness or compliance. The millennium strategies are: eliminate, fix, replace or accept as is.
   The Seabrook project is in the remediation phase and for those items that are in the "Fix" category, includes testing to identify the failure mode due to a Y2K problem, followed by corrective changes to make the item Y2K ready or compliant. The audit team witnessed bench tests of two components with firmware. These bench tests were based on the test procedure developed for embedded systems. Based on the witnessing of the tests, the audit team considers that the test procedure is a thorough, detailed procedure that would adequately identify Y2K problems and aid in identifying and correcting the root cause of the problem.
5. The Seabrook Millennium Project Plan includes an outline of the Contingency Plan based on NEI/NUSMG 98-07 guidance. The Project Organization includes a Contingency Plan Coordinator, and a cross-matrix Contingency Planning Team led by a Contingency Plan Technical Lead. The implementation of the plan is scheduled to start in the later part of 1998. The audit team met with the Technical Lead and members of the Contingency Planning Team and was provided with an outline of the contingency planning process.
6. The audit team met with the ISO New England Coordinator assigned to the project, and was briefed on the activities that have been initiated and planned regarding the Y2K problem as it affects the electric power supply system availability. ISO New England has established sub-committees to exchange Y2K information, create procedures for testing and remediation, and prepare compliance assurance statements.
7. The Seabrook licensee has identified a Y2K problem with the Radiation Data Monitor System (RDMS). The RDMS is a vendor package provide by Sorrento Electric which has been determined to be not Y2K compliant. The vendor has indicated that they have no plans to make this system Y2K compliant. The vendor has identified a work around to provide for RDMS operation if the licensee plans to keep the system. The licensee's strategy for attaining RDMS Y2K compliance/readiness was to investigate alternatives. Several of the plants that use this device, including Seabrook, have formed a Sorrento Owners Group to address and solve the Y2K problem with this device. The options to date are to either obtain a Y2K compliant replacement system (three vendors have been identified) or to implement the vendor identified work around as discussed below.
   The vendor has indicated to their customers that the RDMS cannot properly function with a year identification that ends in 00 (every decade), but that when the year 2000 comes to an end, the system will be able to operate properly in the year 2001. An approach identified by the Seabrook licensee is to change the system date to some date in the past when Seabrook was not tracking data; that is, the date will be setback 28 years. (Initial testing at the Seabrook test bed indicated the RMDS operated with the date of 1972 inserted, but did not function correctly with "00.") Procedurally, the licensee could insert a "dummy" date of say 1978 for the year 2000, and then reset the date correctly to 2001 when that year arrives.
   The present schedule calls for having either the RDMS replacement or work around option implemented by the fourth quarter of 1999. (The necessary Main Plant Computer System software change to "dummy" a date for the RDMS input is scheduled for November 1998 and planned for testing and actual use in the last quarter of 1999.)

Table 1 - Seabrook Millennium Project Plan Schedule		
Activity	Starting date	Finishing Date

Awareness	1997	On-going
Initial Assessment		May 1, 1998
Detailed Assessment/analysis		June 15, 1998
Remediation	November 1998	June 1999*
Contingency Planning	November 1998	
* Except for RDMS which is scheduled for 4th quarter of 1999		

Table 2 - Inventory

	Total	Safety Implication	Plant Trip/ Generaiton Reduction	Reg. Reqmnts	Business Critical	Min. Impact/ No Impact
Software items	745	7	3/1	101	319	159/155
Embedded items (Equipment, firmware, e-prom)	559	5	10/4	58	298	89/95

Table 3 - Inventory Assessment

IMPACT	Accept As Is	Fix	Replace	Eliminate	Total
Safety Implication	7	4	1		12
Plant Trip		13			13
Generation Reduction		5			5
Regulatory Requirement	72	72	11	4	159
Business Critical	322	142	111	42	617
Minimum Impact	169	44	23	12	248
No Impact	202	16	10	22	250
Total	772	296	156	80	1304

The following systems that have safety implications were reviewed by the audit team.

Table 4 - Safety Implications

Millennium Item	Classification	Millennium Status	Strategy	Impact
PDS PDSTRUDL	Safety Critical	Compliant	Accept As Is	Safety Implication
CBS Containment Building Spray	Safety Critical	Compliant	Accept As Is	Safety Implication
DAPPER Distribution Analysis For Power Planing	Safety Critical	Compliant	Accept As Is	Safety Implication
SFHX Spent Fuel Pool Cooling Heat Exchanger	Safety Critical	Compliant	Accepted As Is	Safety Implication
ADL-SK ADLPipe Seabrook	Safety Critical	Compliant	Accepted As Is	Safety Critical
RC Ultrasonic Level Monitoring System	Safety Critical	Not Compliant	Fix Requiring Y2K Testing	Safety Implication

FH Fuel Handling System	Safety Critical	Not Compliant	Fix Requiring Y2K Testing	Safety Implication
FH1 Fuel Handling Machine-MMI	Safety Critical	Not Compliant	Fix Requiring Y2K Testing	Safety Implication
RVLIS Reactor Vessel Level Indication System	Safety Critical	Not Compliant	Fix Y2K testing required	Safety Implication
FIREDET Fire Detection System	Non Rated	Unknown	Replace	Safety Implication
PROTOFLO Proto Power's Proto-Flo Software	Non Rated			Safety Implication
GTS-GTSTRUDL	Safety Critical	Compliant	Accept As Is	Safety Implication
SI Safety Injection	Mission Critical	Not Compliant	Fix Y2K testing required	Minimum Impact
SSPS	Non Rated	Compliant	Accept As Is	No Impact

- PDSTRUDL is a digital computer program used for analysis and design of complex structures. The vendor is Phi-Delta, Inc. The vendor certified that dates were not used in the processing of calculations but were used only as a display function on reports. Four digit dates are used.
- CBS - Containment Building Spray system has no date aware equipment.
- DAPPER is an electrical engineering/software tool manufactured by SKM Systems Analysis. The vendor stated that there are no date related calculations and that there are no known problems. www.skm.com/year2000.html
- SFHX is an in-house software program that was developed to account for the available safety margin with respect to the spent fuel pool heat exchangers (performs thermal performance calculations to determine heat removal rate capability.) There is no date in this program. The program language is C.
- ADL-SK ADLPipe is a pc-based digital computer program used for analysis and design of complex piping systems. According to the vendor, the software is not dependent on calculation of date and/or time in any manner.
- RC-Ultasonic level measuring system is for indication of reactor coolant level during reactor coolant mid-loop (reduced inventory refueling) operation only. Initial Y2K testing is being performed by Westinghouse and will be verified by testing by the licensee. A system modification is in progress for installation of a new EPROM. Y2K testing will be integrated with the re-test of the modification.
- FH-Fuel Handling System has the GE Fanuc Programmable Logic Controller (PLC). The GE automation system consists of a series 90-30/90-20 PLC microcontroller. The system is date & time aware and will be fully tested. Testing will need to be performed during a refueling outage when there is no impact to the refueling schedule.
- FH1-Fuel Handling Machine - Wonderware MMI Software package. The man/machine interface (MMI) to the GE Fanuc PLC is a Wonderware Product which is date and time aware. It will be tested on the refueling machine prior to a refueling outage. The vendor is PAR Systems.
- RVLIS-Reactor Vessel Level Indication System - The RVLIS package will be tested by Westinghouse and retested by the Seabrook licensee. RVLIS is required by post-accident monitoring technical specifications and initiates isolation functions upon indication of a high temperature condition in various locations in the auxiliary building.
- FIREDET-Fire Detection Systems - The licensee is determining whether the system is Y2K compliant.
- PROTOFLO-Proto Power's Proto-Flo Software is written in Visual Basic. According to the vendor, the software is Y2K compliant because dates were not used in processing of calculations but were used as a display only function in reports.
- GTS-GTSRUDL is a digital computer program used for analysis and design of complex structures. The vendor is Phi-Delta, Inc. The programming language used is Fortran. According to vendor, the software is Y2K compliant.
- SI-Safety Injection - The SI system flow transmitter is a non-safety related device that is used in the performance of certain inservice testing to quantify or detect leakage through various valves. The transmitter is essentially a stand alone device that performs an indication only function. Should the device fail, for any reason, alternative flow indication on the same test line is available.
- SSPS - Solid State Protection System has no date aware equipment.

The following table contains the systems that impact power generation reduction which were reviewed by the audit team.

Table 5 - Generation Reduction				
Millennium Item	**Classification**	**Millennium Status**	**Strategy**	**Impact**
FW Rosemount Smart Transmitter Field Programmable Device	Mission Critical	Not Compliant	Fix Y2K testing required	Generation Reduction
SY Sequence of events recorder	Mission Critical	Not Compliant	Fix Y2K testing required	Generation Reduction
SY1 Switchyard Digital Fault Recorder	Mission Critical	Not Compliant	Fix Y2K testing required	Generation Reduction
AS Controller for maintaining auxiliary boiler steam pressure	Non Rated	Not Compliant	Fix Y2K testing required	Generation Reduction
TGS Tagout System	Mission Critical	In Process	Fix	Generation Production

- FW - The Rosemount Smart Transmitter field programmable device output feeds the calorimetric. Failure could cause a reduction or increase in power generation and thus potentially violate technical specifications.
- SY Sequence of event recorder - records relay and breaker actuation in the switchyard. These recordings are used in post trip reviews. Without these recordings, a restart following a trip would be extended several days due to the additional trip analysis required. The recorder is date and time aware.
- SY1 Switchyard digital fault recorder-records voltage and current readings in the switchyard. The data recorded is used for many purposes including post trip analysis. Without these readings, the post trip review could be extended for several days. This recorder also uses the Geographic Position System (GPS) satellite clock.
- AS - This is a digital controller for maintaining auxiliary boiler steam pressure by modulating steam flow to one of the feedwater heaters during feedwater prewarming for plant startup. The vendor is Fischer & Porter. The Fischer & Porter controllers will be tested via a blackbox approach. An identical spare will be used from the warehouse and tested in the technical support facility. When performing this testing, the tester will confirm that the controllers have the same chip # and the same version #.
- TGS - The Tagout System stores, manipulates and modifies data associated with the installation and removal of danger, caution, ground and extension control tags in the plant. The current Software Sense Tagout System does not properly recognize the year 2000. This software is a package that is written in DBASE and Clipper. Tests were performed to determine if minor changes to the Tagout System written in DBASE could permit it to function in the year 2000. The tests were successful, therefore, the strategy for Tagout System compliance is to have the vendor make minor changes to the existing system software such that it recognizes and operates in the year 2000.

The following table lists the systems reviewed by the audit team that impact plant trip.

Table 6 - Plant Trip				
Millennium Item	**Classification**	**Millennium Status**	**Strategy**	**Impact**
SUPVSR Fischer & Porter Supervisor	Mission Critical	Not Compliant	Fix Y2K testing required	Plant trip
DCS DCS Operating System	Mission Critical	Not Compliant	Fix Y2K testing required	Plant trip
HD HDTC Heater Drain Tank Level Control	Mission Critical	Not Compliant	Fix Y2K testing required	Plant trip
SA SA Intellisys	Mission Critical	Not Compliant	Fix Y2K testing required	Plant trip

GSC-COND GSC Rosemount Conductivity Analyzer	Mission Critical	Unknown	Fix	Plant trip
MSD Main Stream Drain	Mission Critical	Not Compliant	Fix Y2K testing required	Plant trip
AR AR-DP Transmitter Pressure Indicators	Mission Critical	Not Compliant	Fix Y2K testing required	Plant trip
MS MSRC Moisture Separator Reheater Control	Mission Control	Not Compliant	Fix Y2K testing required	Plant trip
CO HOTWELL Hotwell Level Control	Mission Control	Not Compliant	Fix Y2K testing	Plant trip

SUPVSR - The Fischer & Porter Supervisor uses 53SU5000 Supervisor PC equipment and controls each of the Fischer & Porter digital controllers in the plant. Y2K compliance must be verified.

DCS - DCS Operating System - The field installation and testing of the Y2K compliant software will be completed in the next refueling outage by Foxboro. The simulator software should be installed and tested in the last quarter of 1998.

HD HDTC Heater Drain Tank Level Control equipment is a Fischer & Porter 53MC5000 controller and will be tested by the licensee.

SA Intellisys - The Ingersoll-Rand rotary air compressor is a microprocessor control package which will be tested by the licensee.

GSC-COND - GSC Rosemount conductivity analyzer model 1054BLC-01 is under review by the licensee.

MSD - Main Steam Drain - The moisture separator reheater (MSR) drain tank level is controlled via Fischer & Porter 53MC5000 digital controllers. If the controller fails either the unit will trip on a high MSR shell side water level or a pipe break could occur in the MSR drain tank lines to the condenser. These controllers will be bench tested with identical spares and then field tested during a refueling outage.

AR - AR-DP Transmitter - These Rosemount 1151 DP5 pressure transmitters auto-start the condenser by initiating valve opening. Failure could prevent the auto-start feature from operating. This pressure transmitter will be bench tested.

MS MSRC Moisture Separator Reheater Control - These Fischer & Porter 53MC5000 controllers will be bench tested for Y2K compliance followed by a field test during a refueling outage.

CO HOTWELL Hotwell level control - The Foxboro 1/A Series hotwell level program/function equipment will be included in the DCS operating system installation and testing.

The following table is a list of items which have a regulatory requirement impact which were reviewed by the audit team.

Table 7- Regulatory Requirement

Millennium Item	**Classification**	**Millennium Status**	**Strategy**	**Impact**
PAC Public Address System	Mission Critical	Not Compliant	Fix Y2K testing required	Regulatory Requirement
SM Seismic Monitoring Software	Mission Critical	Not Compliant	Fix Y2K testing required	
SFD HG Hand Geometry	Business Critical	Not Compliant	Fix Y2K testing required	
NI Boron Dilution Monitor	Mission Critical	Not Compliant	Fix Y2K testing required	
FP COSENTRY Carbon Monoxide Gas Monitoring System	Mission Critical	Not Compliant	Fix Y2K testing required	
FP Fire Protection	Mission Critical	Not Compliant	Fix Y2K testing required	
LPMS Loose parts - Vibration Monitor	Mission Critical	Not Compliant	Fix Y2K test required	

RAW - RAW-AIX Reactor Analysis Workstation	Safety Critical	Compliant	Accept as is	
RDMS RDMS DEC PDP/11 Software	Mission Critical	Not Compliant	Fix	
S3FINC Fixed Incore Analysis	Mission Critical	Not Compliant	Fix Y2K testing required	

PAC - Public Address System - The PAC system is date/time aware and will be remediated in the 3rd quarter of 1998. .

SM Seismic Monitoring Software - The seismic monitor is a new hardware and software package, and will be fully tested. The software performs time/history updating. The vendor (Kinemetrics, Inc.) will be contacted in the last quarter of 1998.

SFD HG Hand Geometry - The hand geometry software package will be changed out. However, the present SFD system, including the hand geometry is being made Y2K compliant as a fallback position against unforeseen delays in delivery of the new system. The testing will be scheduled for the first half of 1999, when the new system is installed. Should the hand geometry software fail, all access to the unit would be via manual means.

NI Boron Dilution Monitor - The Gammametrics Shutdown Monitor RCS-30 does not appear to be date aware. However, several clock functions are used and due to its importance to the plant will be evaluated further.

FP COSENTRY - Carbon Monoxide Gas Monitoring System - The Sierra Monitor Corporation gas monitoring system, SPL5000-8R is date aware in that failure occurs with bad date input. The system will be tested and remediated accordingly.

FP Fire Protection - The Simplex 41000 Fire Protection System has been determined by the vendor to be Y2K compliant. The licensee will verify this determination by testing.

LPMS Loose Parts Vibration Monitoring - The licensee will replace the entire loose parts monitoring system with a pc-based Y2K compliant system. This is a technical specification required system and its inoperability impacts plant operation.

RAW Reactor Analysis Workstation RAW-AIX - The strategy for this item is to accept the statement from IBM that the software is compliant and provide further verification testing using the S3/FINC software to validate this assumption. The product name is AIX, version #4.2, operating system for RS/6000 workstations. (http://www.rs6000.ibm.com/resource/results/year.htm)

RDMS RDMS DEC PDP/11 Software - The RDMS system runs on a Sorrento Electronics DEC/PDP11 platform. The operating system is RSX-11 and the application is written in FORTRAN. This system is not Y2K compliant. The vendor has indicated that they have no plans to make this system Y2K compliant but has identified a work around if the licensee plans to keep the system. The vendor recommended work around is to insert a "dummy" date when data was not being tracked for the year 2000.

S3FINC Fixed Incore Analysis - A contractor has been obtained to perform Y2K testing and verify that the code is Y2K compliant.

Attachment 1

Documents Reviewed

1. Seabrook Millennium Project Plan Revision 3.0, prepared 9/24/98, submitted 9/24/98, approved 9/24/98, effective 9/25/98
2. Technical Support Group Instructions, System Engineering Y2K Implementation Plan, TSGI-13 Rev. 00, prepared 9/23/98, approved 9/23/98
3. Technical Support Group Instructions, Y2K Generic Test Instruction For Embedded Equipment, TSGI-14 Rev. 00 Preliminary Draft, prepared 9/28/98
4. North Atlantic Information Manual (NAIM)

Attachment 2

Entrance Meeting - September 29, 1998

P. Prugnarola	Y2K Sponsor - Information Resources Manager
N. Durand	Y2K Project Manager - Information Services Manager
D. Spaulding	Electronics Engineer - NRC/NRR/HICB
M. Chiramal	Senior Level Advisor - NRC/NRR/HICB

W. A. DiProfio	Station Director
J. M. Brand	NRC - Region I
M. DeBay	Assistant Operations Manager
J. Linville Acting	Chem/HP Manager
P. Casey Senior	Emergency Planning Coordinator
B. Seymour	Security & Safety Manager
J. Sobotka	Reg. Compliance Supervisor
G. McDonald	Nuclear Oversight Consultant
T. Feigenbaum	North Atlantic - CNO
M. Ossing	Senior Project Engineer - NAESCO
G. Gram	Director Support Services
R. White	Mechanical Engineering Manager
J. Watts	Sr. Auditor - Audit & Evaluations
B. Drawbridge	Director of Services
S. West	Tech. Support, Systems Engineering - RM
C. Howard	Comp. Eng. Dept. Manager
M. Mills	Y2K Embedded Systems Coor.

Exit Meeting - October 1, 1998

M. Ossing	North Atlantic
W. A. DiProfio	North Atlantic
S. Wooley	North Atlantic
J. Sobotka	North Atlantic
R. Larson	NRC
J. Watts	North Atlantic
C. Howard	NAESCO
M. Mills	NAESCO
D. Spaulding	NRC
G. Gram	North Atlantic
N. Durand	North Atlantic
J. Grillo	NAESCO
M. Chiramal	NRC

October 27, 1998

Mr. J. S. Keenan, Vice President
Carolina Power & Light Company
Brunswick Steam Electric Plant
Post Office Box 10429
Southport, North Carolina 28461

SUBJECT: AUDIT REPORT ON THE YEAR 2000 PROGRAM - BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 (TAC NOS. MA1813 AND MA1814)

Dear Mr. Keenan:

On October 6-9, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Brunswick Steam Electric Plant Units 1 and 2 as a followup to NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-2019 if you have any questions or comments on the enclosed audit report.

Sincerely,

David C. Trimble, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

Enclosure: As Stated

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation (NRR)
Audit Report
on
Implementation of Generic Letter (GL) 98-01
"Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

Docket Nos:	50-325, 50-324
License No:	DPR-71, DPR-62
Licensee:	Carolina Power & Light Company (CP&L)
Facility:	Brunswick Steam Electric Plant Units 1 & 2
Location:	Highway 87N Southport, NC 28461
Dates:	October 6 - 9, 1998
Audit Team Members:	Matthew Chiramal, NRR Caswell Smith, DRS, Region II Michael Waterman, NRR
Approved by:	Jared Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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    - 2.2.7. Contingency Planning
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Executive Summary

From October 6 through 9, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) readiness program at the Brunswick Steam Electric Plant, Units 1 & 2, (Brunswick) in accordance with the audit plan (Attachment 1) for this activity. The purpose of the audit was to (1) assess the effectiveness of the Carolina Power and Light Company (CP&L) (the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the Brunswick Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the Brunswick Y2K readiness program, the following observations were made:

1. CP&L has a common Y2K project implementation plan which establishes the scope and control of the Nuclear Generation Group (NGG) Year 2000 Readiness Program at CP&L's three nuclear power stations (Brunswick, Robinson, and Shearon Harris) and two engineering divisions. The plant-specific NGG Year 2000 Readiness Program Project Implementation Plan for the Brunswick Nuclear Plant is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The Brunswick Y2K readiness program is receiving appropriate management support and oversight.
3. The licensee began the formal Brunswick Y2K readiness program in September 1997, developed the plant inventory by December 1997, completed the initial assessment phase in March 1998, and is scheduled to complete the detailed assessment phase in December 1998. The licensee has established a tightly-controlled schedule in order to meet the June 1999 Y2K readiness date established by the program. (The one exception in meeting the readiness schedule is the installation and integrated system testing of the modified, Y2K compliant digital feedwater control system application in Brunswick Unit 1. The licensee plans to take a forced outage on Unit 1 sometime in the Fall of 1999 to accomplish this activity.) The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification of major critical computer systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group, EPRI and CDSV, the utility alliance with Duke Energy, South Carolina Electric & Gas, and Virginia Power.
4. The licensee has started the Brunswick Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the next revision of the Brunswick Year 2000 Readiness Project Implementation Plan. With proper integration of this effort in the project implementation plan and schedule, the licensee should be able to complete this effort by July 1999 with the exception of some required testing.

5. The licensee is accepting vendor certifications for embedded components including those in high priority mission critical systems without conducting additional confirmatory testing at the plant site. This approach is based upon the licensee's reliance on and confidence in its established vendor qualification program and resulting approved vendor/supplier list. The audit team acknowledged that the decision on whether to perform additional embedded component susceptibility testing is based on the licensee's determination of the importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information obtained.
6. The audit team identified an area of inconsistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found (in high priority applications) that different licensee business units use a variation of the test guidance.

   The audit team concludes that the NGG Y2K testing effort would benefit from additional communication between business units or additional training to ensure consistent application of the test procedure guidelines. The licensee stated that aggressive actions to address this issue at the NGG level have been initiated.

Report Details

1.0 Introduction

The objectives of the Brunswick Units 1 and 2 plant-specific CP&L NGG Y2K Readiness Program audit were to:

1. Assess the effectiveness of the CP&L (the licensee) program for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems,
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and,
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan outline (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL 98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team obtained and reviewed the CP&L Year 2000 Program Implementation Plan (Document Number 3 listed in Attachment 2).

The audit process started with an entrance meeting attended by the CP&L NGG Year 2000 Project Manager (PM), the Brunswick Nuclear Plant site Y2K Coordinator and other site personnel, and members of the audit team. Attachment 3 is a list of the attendees. The PM and members of the project team described the project organization, the project plan and its implementation, and the project status and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the project plan and its associated procedures, the plan implementation products (documents and data bases) and interacting with the project manager and project team members. The documents reviewed are listed in Attachment 2.

2.0 Brunswick Y2k Project Description

2.1 Project Organization

The Brunswick Steam Electric Plant (BSEP) Site Coordinator for Y2K readiness is Gil Manacsa. Mr. Manacsa reports to Eric Northeim, who is the project manager (PM) for the CP&L NGG Year 2000 Readiness Project, of which BSEP is one of three CP&L plant sites that use the NGG project implementation plan. The BSEP Y2K readiness project site sponsor is Bo Lindgren. The BSEP Y2K readiness project has 12-15 full-time equivalent persons, divided among approximately 20 staff. The PM has overall responsibility for the project and reports to the Manager of the CP&L Nuclear IT Group, who reports in turn to Tom Walt (Project Sponsor), Department Manger for Operations and Environmental Support Department. Tom Walt reports to Scotty Hinnant, Chief Nuclear Officer, CP&L.

Brunswick participates with other organizations that are addressing the Y2K effort. The licensee has been involved with the BWR Owners Group, the alliance with Duke Power Company, South Carolina Electric & Gas, and Virginia Power (The CDSV Nuclear Exchange Program), and is a participant in the EPRI Embedded System Program.

2.2 Project Plan

The Brunswick plant-specific Year 2000 Project Implementation Plan (Item 5 of Documents Reviewed) was developed by the licensee to establish the scope and control of the plant program consistent with a common plan (Item 3 of Documents Reviewed) which is applied uniformly at the three CP&L nuclear power plant sites, and in the two CP&L corporate engineering divisions. The audit team reviewed Rev. 3 of the CP&L NGG common plan, dated September 4, 1998. Revision 4 of this plan is to be issued in October, 1998. The CP&L NGG Project Implementation Plan is based on the guidance provided in NEI/NUSMG 97-07, which was endorsed by the NRC in NRC Generic Letter 98-01 as guidance which presents one approach for achieving Y2K readiness. The audit team's review confirmed that the NGG Year 2000 Project Implementation Plan is based on the guidance contained in NEI/NUSMG 97-07.

The NGG Year 2000 Project Implementation Plan consists of the following phases: the Study Phase, which comprises the elements of Awareness and Initial Assessment; the Implementation Phase, which contains the elements of Detailed Assessment, Testing, Remediation, and Validation; and the Contingency Planning Phase. The project implementation plan also includes requirements for quality assurance, regulatory considerations, and documentation.

2.2.1 Awareness

At Brunswick, the formal Y2K Study Phase of the Y2K program was initiated in August 1997. Part of this program phase included the Project Communications Plan, Rev. 0, which was completed on December 9, 1997. The Communications Plan describes the actions necessary to inform NGG management and employees, and interface with the CP&L corporate Y2K compliance effort and external organizations. The Communication Plan prescribes actions for briefing NGG management, educating the general population of NGG personnel via departmental newsletters, training personnel who are to perform inventory and assessment activities, coordinating Y2K team communications, and reporting of team progress to NGG management.

The audit team reviewed samples of communiques issued from November 1997 to early 1998. Based on the samples reviewed the audit team considers that CP&L has an effective Y2K awareness program.

The Brunswick Y2K project implementation schedule is provided in Table 1.

2.2.2 Initial Assessment

The initial assessment part of the Study Phase of the Brunswick Year 2000 Project started in August 1997 and was completed by March 1998. The completed initial assessment resulted in the identification of an inventory of the software applications and embedded system components at the Brunswick. The tasks of initial assessment included: (1) inventory, (2) categorization, (3) classification, (4) prioritization and, (5) analysis of the initial assessment.

The inventory of potentially impacted applications, computer systems and hardware, and embedded plant systems/components was developed by plant personnel familiar with and responsible for each business unit area using the Year 2000 project scope assessment data sheet which is part of the Project Implementation Plan. For software applications, the licensee used the inventory developed for the plant software quality assurance manual as means for gaining additional confidence in the completed inventory.

In the identification of embedded systems, the licensee reviewed the procedures and documentation for occurrences of phrases that would indicate the existence of an internal clock or processor, surveyed the vendors for information on their equipment, performed system walk-downs, and reviewed schematics, program listings, and reference manuals on various instrumentation and control systems. The results of the Brunswick initial assessment of the software applications and embedded items are placed in the Brunswick Y2K Application Checklist and Embedded Component Summary.

The total inventory of potentially affected systems at the Brunswick Nuclear Plant is 736 - 252 software applications and 484 embedded systems/components. Table 2 provides the results of the inventory of software items and Table 4 lists the embedded systems/components. Of the total of identified embedded items, 190 items were assigned

High priority, and 64 of these High priority items have been certified to be Y2K compliant. Table 5 lists those embedded systems that were reviewed by the audit team.

Prioritization

The inventory includes a prioritization of the identified items. The priority is based on the criticality and risk of the functions performed. The licensee used risk assessment methods to prioritize each inventoried item as high, medium, low, or replaced/obsolete. High priority

items are those items whose failure could affect nuclear or personnel safety, adherence to regulatory requirements, or loss of plant capacity. Medium priority items are those items whose failure could significantly impair the ability of the licensee to execute major business functions, cause unavailability of Maintenance Rule systems, or could create operator workarounds. Low priority items are those items whose failure could cause inconvenience but would not impair the licensee's ability to perform major business or system functions. Replaced or obsolete items are those items that will be replaced or become obsolete before Y2K problems are encountered. The licensee's prioritization process encompasses the criteria described in NEI/NUSMG 97-07.

Tables 2 and 4 list the prioritization of the inventoried software applications and embedded systems, respectively. Of the 26 High priority software items identified, 4 items have been certified Y2K compliant, and 22 items require assessment testing. Table 3 provides a list of high priority software applications at the Brunswick Nuclear Plant.

Analysis of Initial Assessment

The results of the Brunswick initial assessment of the software applications and embedded component items are in the Brunswick Y2K Application Checklist and Embedded Component Summary. The licensee completed the initial assessment phase in March, 1998. Analysis of the initial assessment is the final step in the Study Phase. During the analysis of the initial assessment, the licensee evaluated the failure risk of each item as the basis for assigning the priority; recommended the approach/plan for detailed assessment, testing, and remediation; and estimated the detailed assessment/remediation cost. Unless specifically noted otherwise, the licensee did not formally assess and remediate low priority items. Remediation of these items will be done as time and resources permit. Items with a Replaced/Obsolete designation were not assessed and no remediation actions will be taken.

NRC Audit Team Assessment

The audit team reviewed in detail 6 of the 26 high priority software applications initial assessment packages identified in Table 3, and 34 of the 484 embedded components identified by the licensee, as identified in Table 5. The reviewed embedded components were designated high priority and were selected from a database print-out provided to the audit team by the licensee. The audit team also reviewed some assessment data of a few items in the medium and low priority categories. Based on its review, the audit team found the initial assessment phase to be appropriate and implemented consistent with the guidelines in NEI/NUSMG 97-07.

2.2.3. Detailed Assessment

In the Brunswick Year 2000 Readiness Program Implementation Plan, the Implementation Phase contains the elements of Detailed Assessment, Testing, Remediation, and Validation.

Detailed assessment is performed for all high and medium priority items consisting of vendor evaluation, interface evaluation, spare parts evaluation, training system evaluation, test plans/results, subject matter experts review, and results. Vendor evaluation encompasses evaluation of available manufacturer/developer information (such as contracts, correspondence, vendor manuals, internet listings, and vendor owners groups), communication with vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Interface evaluation includes both internal and external system interfaces for passing date and time related data. Test plans/results involves the development of test procedures and acceptance criteria to determine if a Y2K date problem exists. Using the CP&L Corporate Testing Guideline. If no testing is performed, justification should be provided as to why it was not required. Spare parts evaluation involves the review of items to ensure that Y2K problems are not recurrent after remediation efforts are completed. Training systems evaluations address training systems that duplicate plant systems, such as the plant simulator. The assessment considers the impact of Y2K problems on simulator existing equipment and upgrades. Subject matter expert review addresses the use of any other relevant information obtained through walkdowns, review of embedded chips, and review of source code. Results of the assessments provide remediation recommendations and justifications.

The licensee is scheduled to complete its detailed assessment in December, 1998. To date, detailed assessment has been completed on 308 of 736 total items. Based on the audit team's review of completed items, the audit team found that the detailed assessments performed to date follow the project implementation plan.

2.2.4. Y2K Testing and Validation

As part of the Implementation Phase of the project implementation plan, test procedures are to be developed for High and Medium priority items to determine if a Y2K problem exists using the testing criteria of the program implementation plan. If no test is to be performed justification is to be provided as to why it was not required.

The licensee is accepting vendor certifications for embedded components including those in high priority mission critical systems without conducting additional confirmatory testing at the plant site. This approach is based upon the licensee's reliance on and confidence in its established vendor qualification program and resulting approved vendor/supplier list. Responsibility for ensuring proper implementation of the vendor qualification program lies with the Brunswick Quality Assurance Department. The audit team acknowledged that the decision on whether to perform additional embedded component susceptibility testing is based on the licensee's

determination of importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information obtained.

The audit team identified an area of inconsistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found (in high priority applications) that different licensee business units use a variation of the test guidance as follows:

- The 9/9/99 date test is not always performed. In some of the test cases, the test is done by starting from 9/9/99 and rolling the date over to 9/10/99, and in some of the cases, the test is started on 9/8/99 and rolled over to 9/9/99.
- The 12/31/99 rollover to 1/1/2000 and continuance into the year 2000 is done in different ways.
- The Leap Year test is done differently, with 2/28/2000 rolled over to 2/29/2000. In some cases the test verifies 2/29/2000 rollover to 3/1/2000, and in other tests this is not verified.
- In some cases the Leap Year tests an incorrect rollover from 12/30/2000 to 1/1/2001 (failure to recognized a 366-day year), and in other cases this is not tested.

The audit team concludes that the NGG Y2K testing effort would benefit from additional communication between the business units or additional training to ensure consistent application of the test procedure guidelines. The licensee agreed to promptly address this issue throughout the NGG organization.

2.2.5. Remediation

Remediation is the process of retiring, replacing or modifying of software or embedded software devices that are to be retained in service, but have been determined to be affected by the Y2K problem. The program implementation plan provided Y2K compliance criteria for replacement or modification. After remediation is completed, validation testing is required. The licensee is performing these modifications and upgrades using existing plant procedures for digital systems. The final documentation of the detailed assessment and remediation is the Year 2000 Certification Package.

2.2.6. Regulatory Considerations

The Brunswick Year 2000 Project Implementation Plan and associated documents (items 1, 2, 3, 4, and 5 of documents reviewed) include references to existing plant procedures that have guidance on regulatory considerations, such as 10 CFR 50.59 for plant modification reviews, reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.7. Contingency Planning

Brunswick has begun contingency planning using a framework similar to that described in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The contingency plan is scheduled for completion in October, 1998, when it will be integrated with the Brunswick Year 2000 Project Implementation Plan, Revision 4. The audit team was briefed on the contingency planning aspects in the draft version of the forthcoming Revision 4. Based upon the briefing and a review of the draft plan, the audit team considers that the proposed contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07. If at the completion of the detailed assessment phase the integrated plan is implemented with the same rigor as presently applied, the audit team believes that the July 1999 schedule for completion of the project contingency plans can be achieved, with the exception that some of the training needs may extend into the third and fourth quarters of 1999.

2.2.8. Y2K Program Management

The Brunswick Y2K readiness program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a lightboard format that defines the progress of each Y2K system being evaluated. Additionally, the licensee graphically summarizes the status of each phase for corporate management review. From discussions with licensee personnel, schedule slippages have resulted in counseling and immediate corporate management attention. At present, there are no schedule slippages in the Y2K program at Brunswick.

2.2.9. Electric Grid Issues

The audit team discussed electric grid issues with the licensee. The licensee stated that the Southeastern US region has initiated activities to address grid reliability with respect to the Y2K problem . Within this region, there are four subregions, one of which is VaCar, consisting of power suppliers Virginia Power, Duke Energy, CP&L, and Southern Carolina Gas & Electric . CP&L as part of VaCar, has initiated Y2K problem assessments of the various business units affecting the grid including Generation, Transmission & Distribution, and Power Management Systems.

The CP&L corporate Y2K program includes contingency planning which interfaces with the Brunswick Y2K program contingency plan.

The licensee is addressing internal and external risks that can affect the grid availability. The contingency plans are intended to be consistent between utilities in the region to ensure one utility will not adversely impact others. The contingency plans will consider probable and credible worst-case scenarios for external as well as internal events. To ensure sufficient electrical energy resources are available, the region utilities are using last New Years Eve electrical demand to estimate the energy demand required for New Years eve, 1999. The licensee estimates that the grid load will be at 60% capacity and is committed to have reserves on line to handle additional supplier demands. Black-start capabilities and capacities are also being addressed.

The licensee plans to test the software at the Power Management Systems' energy control center on the energy control center simulator. The simulator will be run to simulate potential Y2K events. External risks will also be considered via impact studies. Such risks include critical item suppliers, sabotage potential, telecommunications, satellite synchronization, and global positioning system failures. The audit team determined that licensee Y2K program efforts to address grid reliability are appropriate.

3.0 Audit Team Observations

The following observations were made by the team auditing the Brunswick Y2K readiness program:

- CP&L has a common Y2K project implementation plan which establishes the scope and controls of the NGG Year 2000 Readiness Program at CP&L's three nuclear power stations (Brunswick, Robinson, and Shearon Harris) and two engineering divisions. The plant-specific NGG Year 2000 Readiness Program Project Implementation Plan for the Brunswick Nuclear Plant is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
- The Brunswick Y2K readiness program is receiving appropriate management support and oversight.
- The licensee began the formal Brunswick Y2K readiness program in September 1997, developed the plant inventory by December 1997, and completed the initial assessment phase in March 1998, and is scheduled to complete the detailed assessment phase in December 1998. The licensee has established a tightly-controlled schedule in order to meet the June 1999 Y2K readiness date established by the program. (The one exception in meeting the readiness schedule is the installation and integrated system testing of the modified, Y2K compliant digital feedwater control system application in Brunswick Unit 1. The licensee plans to take a forced outage on Unit 1 sometime in the Fall of 1999 to accomplish this activity.) The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification of major critical computer systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group EPRI and CDSV, the utility alliance with Duke Energy, South Carolina Electric & Gas, and Virginia Power.
- The licensee has started the Brunswick Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the next revision of the Brunswick Year 2000 Readiness Project Implementation Plan. With proper integration of this effort in the project implementation plan and schedule, the licensee should be able to complete this effort by July 1999, with the exception of some required training.
- The licensee is accepting vendor certifications for embedded components including those in high priority mission critical systems without conducting additional confirmatory testing at the plant site. This approach is based upon the licensee's reliance on and confidence in its established vendor qualification program and resulting approved vendor/supplier list. The audit team acknowledged that the decision on whether to perform additional embedded component Y2K susceptibility testing is based on the licensee's determination of the importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information obtained.
- The audit team identified an area of inconsistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found (in high priority applications) that different licensee business units use a variation of the test guidance. The audit team concludes that the NGG Y2K testing effort would benefit from additional communication between business units or additional training to ensure consistent application of the test procedure guidelines. The licensee stated that aggressive actions to address this issue at the NGG level has been initiated.

Tables and Attachments

Table 1 - Brunswick Y2K Project Implementation Schedule

Activity	Starting Date	Finishing Date
Awareness	1994*, August 1997 (continuing)**	September 1998
Initial Assessment	December 1997	March 1998
Detailed Assessment	June 1998	December 1998
Testing/Validation	June 1998	June 1999

Remediation	June 1998	June 1999
Contingency	September 1998	July 1999

*A limited awareness effort began with the receipt and review of NRC Information Notice 96-70 in December 1996.
**The Brunswick personnel are kept informed of the Y2K readiness project status through the Site News Letters.

Table 2 - Software Inventory

	Priority				
BSEP Business Unit	**High**	**Medium**	**Low**	**R/O**	**Total**
Chemistry		4	26	2	32
Document Services		1	12	6	19
Engineering	3	11	12	5	31
Emergency Planning	2	2			4
Health Physics		29	20	1	50
Maintenance	2	8	6	1	17
Nuclear Assessment			5		5
Nuclear Information Technology	1	1	18	8	28
Outage and Scheduling	3	9	12	2	26
Process Computing	11	6	10	1	28
Regulatory Affairs				1	1
Security			4		4
Training	4			3	7
Total	26	71	125	30	252

Table 3 - Inventory of High Priority Software at Brunswick

Software Applications		
File Number	**Name**	**Complete**
A0578	Pod	Y*
A0579	Pod_apps	Y*
A0764	SPDS	Y*
A0887	Work Control	Y*
A0057	Battery Capacitance Test Set	*
A0067	BNP Simulator	
A0068	BNP Simulator CMS (new)	
A0130	Core Flow Calculations	
A0135	CPL DOSE - Initial Dose Projection	
A0172	DIALOGIC (BEN)	
A0231	EQDB	
A0234	ERDS	
A0236	ERFIS	
A0309	HEATBALA, Heat Balance Calculations, PT 1.8D	
A0310	HEATBALB, Heat Balance Calculations, PT-1.8D	
A0358	IRIX Operating System for Simulator Computer	
A0473	NE - Nuclear Engineering core monitoring program	
A0509	Off Gas 6.2.1 (OG61)	

A0570	Plant Monitoring System (AFORA PMS)	
A0572	Plant Process Computer(PPC)	
A0701	RODTIM	
A0771	SPTMS	
A0810	TIP Traces, ETIP	
A0818	TRA	
A0857	VOTES (BNP)	*
A0903	DFW-Simulator	
* Reviewed by NRCaudit team during audit		

Table 4 - Inventory of Embedded Systems					
	Priority				
Business Unit	**High**	**Medium**	**Low**	**R/O**	**Total**
Engineering	146	105	164	3	418
Process Computing	44	2	13	7	66
Total	190	107	177	10	484

Table 5 - Embedded Components Reviewed by the Audit Team		
Embedded Systems		
File Number	**Name**	**Completed**
BNP0084	X-Ray Search	Y*
BNP0085	X-Ray Search	Y*
BNP0086	X-Ray Search	Y*
BNP0104	C95-P603D. Shift Foreman Display Mon/processor	Y*
BNP0110	C95-P601C. TSC RM143 Color Display Mon/processor	Y*
BNP0111	C95-P602C. TSC RM123 Color Display Mon/processor	Y*
BNP0111	C95-P602C. TSC RM123 Color Display Mon/processor	Y*
BNP0112	C95-P603B. STA Desk Color Display Mon/processor	Y*
BNP0113	C95-P603D. Shift Foreman Display Mon/processor	Y*
BNP0121	C95-V3CR11. SPDS RTGB Workstation.	Y*
BNP0121	SPDS Workstations	Y*
BNP0121	C95-V3TS02. TSC RM143A SPDS Workstation.	Y*
BNP0121	C95-V3CR12. SPDS Control Operators Workstation	Y*
BNP0122	C95-V7EF04. TSC RM123 SPDS Workstation.	Y*
BNP0122	C95-V7TS03. TSC RM150 SPDS Workstation.	Y*
BNP0211	Flow Controller	Y*
BNP0211	Flow Controller	Y*
BNP0211	Flow Controller	Y*
BNP0211	Flow Controller	Y*
BNP0217	VA-FR-3359. Main Stack Flow Recorder	Y*
BNP0220	D12-RR-R601. Off Gas System Radiation Recorder	Y*
BNP0220	D12-RR-R601. Off Gas System Radiation Recorder	Y*
BNP0221	CAC-AR-1260. CONT ATM RAD , H2 & O2 Recorder	Y*
BNP0221	CAC-AR-1260. CONT ATM RAD, H2 & O2 Recorder	Y*
BNP0221	CAC-AR-1262. CONT ATM RAD, H2 & O2 Recorder	Y*
BNP0221	CAC-AR-1264. RX BLDG Roof Vent Radiation Recorder	Y*
BNP0221	CAC-AR-1262. CONT ATM RAD, H2 & O2 Recorder	Y*

BNP0225	SRV Leak Detectors	Y*
BNP0225	SRV Leak Detectors	Y*
BNP0255	Suppression Pool Temperature Monitoring System	Y*
BNP0257	SPDS RTGB Workstation	Y*
BNP0257	SPDS Control Operators Workstation	Y*
BNP0258	C95-V7CN11. SPDS Master Station	Y*
BNP0258	C95-V7CN21. SPDS Master Station	Y*

Attachment 1

Brunswick Y2K Audit Plan Outline

A. Project organization
B. Project Manager -
C. Project Sponsor -
1. Participation in BWR Owners Group, CDSV group activities related to the Y2K effort, (EPRI, NEI). Peer review efforts thru CDSV group. EPRI participation for embedded systems.
2. Corporate activities
3. Schedule of activities for Y2K readiness

Activity	Starting Date	Finishing Date
Communication/ Awareness		
Project Plan		
Inventory		
Detailed analysis/testing		
Remediation		
Validation/testing		
Contingency Planning		

4. Inventory
(Review the Information Database.)

Classification:

5. Analysis -
Number of items identified as Y2K compliant. Review how this was determined - Vendor data; any additional testing.
Number of items not Y2K compliant -

Accept As Is: (Review how this was determined. ___ require validation testing. Check vendor data, Owners Group data, any testing by vendor?)
Eliminate
Fix
Replace

a) Vendor evaluation - validation testing based on criticality of item, prior experience with vendor, extent of documentation, or plant knowledge of the item
b) Plant owned or supported software (including tools) evaluation - knowledge based decisions, scanning, testing. When testing proposed, need test specifications and procedures.
c) Interface evaluation - Part of corporate plan (?) Grid, substation, communication,
d) Embedded components evaluation - knowledge based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. (Review the documents when this is the case.)

6. Remediation - Use of existing software procedures (?). Verify long term commitments for maintaining Y2K readiness.
7. Y2K Testing and Validation
- Assessment testing - Per Computer problem/change reports (PCRs) and associated V&V plans and test procedures.
- Testing subsequent to remediation - unit testing; integration testing; system testing.
8. Regulatory Considerations - 10 CFR 50.59 reviews; reportability evaluations per 10 CFR 50.72, 50.73 and part 21; operability determinations.
9. Contingency Planning - NEI/NUSMG 98-07, GAO/AIMD -10.1.19
Internal Risks
External Risks
Remediation Risks (Vendor support, resource limitations, etc.)

10. Y2K Management Plan-
    Tracking against milestones of the project. Management awareness. Status reporting
    External resources
    Use of existing procedures for software QA, configuration management, V&V.,
    Documentation
    Audits (any audits done/reports issued).

Attachment 2

Documents Reviewed

1. NGG Year 2000 Readiness Project Team (Roster of participants)
2. Carolina Power & Light Company Year 2000 Compliance Program Organization Chart, dated August 18, 1998
3. "Project Implementation Plan, NGG Year 2000 Readiness Program," Rev. 3, dated September 4, 1998
4. CP&L Phased Project Authorization Distribution, "BNP Year 2000 Readiness," dated June 15, 1998.
5. Implementation Phase Project Authorization, "BNP Year 2000 Readiness Project," dated May 15, 1998.
6. NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," dated October 1997.
7. NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," dated August 1998.
8. NRC Generic Letter No. 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," dated May 11, 1998.
9. Letter from CP&L to US NRC, "Response to Generic Letter 98-01, 'Year 2000 Readiness of Computer Systems at Nuclear Power Plants,'" dated August 7, 1998.
10. "Year 2000 Business Unit Action Plan Summary - BNP SW," dated September 23, 1998
11. "Year 2000 Business Unit Action Plan Summary - BNP Plant Systems," dated September 24, 1998
12. Brunswick Nuclear Plant NGG Year 2000 Program Implementation Status," (lightboards for Applications and Plant Components), dated October 2, 1998
13. Brunswick Nuclear Plant NGG Year 2000 Program Milestone Schedule," (for Applications and Plant Components), dated October 2, 1998
14. "Y2K Project Schedule Exception Report," memorandum from J. Colburn, CP&L, to T. D. Walt, CP&L, dated October 1, 1998.
15. "Project Review and Authorization Standard Procedure," Vol. 99, Book/Part 99, Rev. 1, ADM-NGGC-0102, dated August 22, 1997.
16. Project Management Standard Procedure," Vol. 99, Book/Part 99, Rev. 3, ADM-NGGC-0103, dated May 7, 1998.
17. "Corrective Action Management Standard Procedure," Vol. 99, Book/Part 99, Rev. 1, CAP-NGGC-0001, dated July 8, 1998.
18. "Computer Configuration Control Standard Procedure," Vol. 99, Book/Part 99, Rev. 0, CSP-NGGC-2505, dated August 21, 1998.
19. "Computer Software Change/Activity Request Standard Procedure," Vol. 99, Book/Part 99, Rev. 0, CSP-NGGC-2506, dated August 21, 1998.
20. "Computer Software Documentation and Testing Standard Procedure," Vol. 99, Book/Part 99, Rev. 0, CSP-NGGC-2507, dated August 21, 1998.
21. "Quality Assurance Program Manual," Rev. 1, NGGM-PM-0007, dated July 10, 1998
22. "Engineering Service Requests Standard Procedure," Vol. 99, Book/Part 99, Rev. 9, CSP-NGGC-2505, dated July 13, 1998
23. "Project Implementation Plan, NGG Year 2000 Readiness Program," Rev. 4 (Draft).
24. Trip Report from M. Pugh to NGG Corporate Management, "Region II Y2K Contingency Planning Workshop on September 9-10, 1998," no date.
25. Summary of Y2K Vendor Management Program accomplishments, dated September 30, 1998.
26. Phase I pie graph of responses from vendors regarding product Y2K compliance.
27. Phase II Supplier list of vendors with Y2K compliancy dates for letters mailed to vendors and responses received from vendors.
28. Sample letters to vendors and from vendor regarding Y2K compliancy of products
29. Samples of Awareness presentations and newsletter
30. Year 2000 Compliance Packages (see File No.s corresponding to asterisks in "Complete" column in Tables 3 and 5).

Attachment 3

Entrance Meeting - Attendees
October 6, 1998

J. S. Keenan	VP, Brunswick NP
E. Hux	Director of Site Operations
K. R. Jury	Manager, Regulatory Affairs
G. Long	Operations Project Analyst
J. P. Gawron	Nuclear Assessment Section Manager
G. D. Miller	BNP Engineering Support Services Manager
R. DeLong	Elec/I&C ESS Supervisor
K. Nicely	Senior Engineer, Regulatory Affairs
P. Leich	NIT Supervisor
K. Karp	BESS Project Engineer
E. Northeim	NGG Y2K Project Manager
G. Manacsa	NIT Y2K Site Coordinator
N. Segars	NIT Y2K Admin Asst
B. Lindgren	Site Support Section Manager
G. Johnson	PES Principal Engineer
H. Willetts	BESS Elec/I&C Supervisor
J. Corcetti	Security Sr Business Analyst
C. Schnell	Operations Project Analyst
E. Campbell	ComEd Y2K Project Manager
E. Brown	NRC BNP Resident Inspector
G. Guthrie	NRC BNP Resident Inspector
M. Chiramal	NRR
M. Waterman	NRR
C. Smith	DRS, Region II

[Year 2000 Home Page | NRC Home Page]

November 30, 1998

Mr. Harold W. Keiser
Chief Nuclear Officer & President -
Nuclear Business Unit
Public Service Electric & Gas
Company
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: AUDIT REPORT ON THE YEAR 2000 PROGRAM, HOPE CREEK GENERATING STATION (TAC NO. MA1845)

Dear Mr. Keiser:

On October 26-29, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Hope Creek Generating Station as a followup to NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-1420 if you have any questions or comments on the enclosed audit report.

Sincerely,

ORIGINAL SIGNED BY:

Richard B. Ennis, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosure: As stated

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION (NRR)
AUDIT REPORT
ON
IMPLEMENTATION OF GENERIC LETTER (GL) 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-354
License No:	NPF-57
Licensee:	Public Service Electric & Gas Company (PSE&G)
Facility:	Hope Creek Generating Station
Location:	Handcocks Bridge, NJ
Dates:	October 26 - 29, 1998
Audit Team Members:	Michael Waterman, NRR Mario Gareri, NRR Aniello Della Greca, DRS, Region I
Approved by:	Jared Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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- Executive Summary

- Report Details
  - 1.0 Introduction
  - 2.0 Hope Creek Y2K Project Description
    - 2.1 Project Organization
    - 2.2 Project Plan
      - 2.2.1 Awareness
      - 2.2.2 Initial Assessment
      - 2.2.3. Detailed Assessment
      - 2.2.4. Y2K Testing and Validation
      - 2.2.5. Remediation
      - 2.2.6. Regulatory Considerations
      - 2.2.7. Contingency Planning
      - 2.2.8. Y2K Program Management
      - 2.2.9. Electric Grid Issues
  - 3.0 Audit Team Observations
- Tables and Attachments

Executive Summary

From October 26 through 29, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) readiness program at the Hope Creek Generating Station (Hope Creek) in accordance with the audit plan (Attachment 1) for this activity. The purpose of the audit was to (1) assess the effectiveness of the Public Service Electric and Gas Company (PSE&G, the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the Hope Creek Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the Hope Creek Y2K readiness program, the following observations were made:

1. PSE&G has a common Y2K project implementation plan which establishes the scope and control of the Nuclear Business Unit (NBU) Y2K Project Plan at the Hope Creek plant. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The Hope Creek Y2K program is receiving appropriate management support and oversight.
3. The licensee began the formal Hope Creek Y2K readiness program on August 1, 1997, and finished the plant inventory and initial assessment phase on April 15, 1998. The detailed assessment phase was begun January 19, 1998. The detailed assessment phase for mission critical information systems and information technology was completed September 15, 1998. The detailed assessment phase for the mission critical digital systems (embedded components) is scheduled to be completed February 24, 1999. The licensee has established a tightly controlled schedule for completing the Y2K readiness implementation phase for mission critical systems and components by September 30, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification or replacement of major critical computer systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group, Westinghouse Owners Group, EPRI, PECO, the Northeast Energy Alliance (NEA), and PJM Interconnection, L.L.C.
4. The licensee has started the PSE&G NBU Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the PSE&G NBU Year 2000 Project Plan. With proper integration of this effort in the project implementation plan and schedule, the licensee should be able to complete this effort by September 30, 1999.
5. The licensee is conducting confirmatory testing of mission critical system Y2K compliance at the plant site, regardless of vendor certifications. The licensee stated that this was necessary because some vendor certifications of Y2K compliance have not been

reliable.

6. The licensee will be implementing a program in which Y2K project team members will routinely evaluate documentation packages prepared by other team members. For example, Y2K team members involved in digital systems Y2K compliance will review packages prepared by information systems/information technology (IS/IT) Y2K team members. This approach is commendable and appropriate.
7. The licensee's independent assessment of the PSE&G NBU Y2K project plan was thorough. Recommendations from that assessment are being addressed by the PSE&G NBU Y2K project team for subsequent revisions of the PSE&G NBU Y2K project plan.
8. Materials management is being addressed aggressively at the PSE&G Enterprise level. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future material control.
9. Contingency planning for reactor operations is critical. Senior reactor operators (SROs) from Hope Creek and Salem have been assigned to help with Y2K contingency planning; however, a dedicated full time lead for internal contingency planning apparently is not on board. This could impact contingency planning schedules. The licensee is pursuing this issue.

Report Details

1.0 Introduction

The objectives of the Hope Creek Y2K readiness program audit were to:

1. Assess the effectiveness of the PSE&G NBU (the licensee) program for achieving Y2K readiness, including continued safe operation of the Hope Creek plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems,
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC GL 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and,
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan outline (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL 98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team obtained and reviewed the PSE&G NBU Y2K Project Plan, Rev. 3, dated June 1998. (Document Number 2 listed in Attachment 2).

The audit process started with an entrance meeting attended by the PSE&G NBU Year 2000 Project Manager (PM), Y2K project team members, senior and other site personnel, and members of the audit team. Attachment 3 is a list of the attendees. The PM and members of the project team described project organization, the project plan and its implementation, project status, and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the project plan and its associated procedures, the plan implementation products (documents and data bases) and interacting with the project manager and project team members. The documents reviewed and referenced in this audit are listed in Attachment 2.

2.0 Hope Creek Y2K Project Description

2.1 Project Organization

The Salem-Hope Creek project manager (PM) for the PSE&G NBU Year 2000 Project is Mr. R. Moore. The PM reports to the NBU Director of Special Projects (Mr. G. Overbeck) and to the NBU Senior Vice President, Nuclear Engineering (Mr. E. Simpson), who reports to the NBU Chief Nuclear Officer, who reports in turn to the PSE&G Enterprise Chief Executive Officer (CEO), who is the Enterprise Y2K sponsor. The PM stated that aggressive sponsoring efforts by Mr. Simpson and Mr. Overbeck have been critical to the success of the NBU Y2K program.

The PSE&G NBU Y2K readiness program has 30 full-time equivalent persons and an additional 9 part time persons supporting selected

portions of the Y2K project. The licensee is also contracting with General Electric and Westinghouse for support. The Y2K project scope includes both Salem Nuclear Generating Station, Units 1&2 and Hope Creek.

The licensee is currently merging many of the separate programs and processes at Hope Creek and Salem into single organizations to serve both plants. Additionally, the Y2K project at Hope Creek includes software and embedded systems at Salem. Consequently, many of the Hope Creek Y2K efforts reviewed by the staff also apply to Salem.

The licensee participates with other organizations that are addressing the Y2K problem. The licensee has been involved with the Boiling Water Reactor Owners Group, Westinghouse Owners Group, EPRI, PECO, the Northeast Energy Alliance (NEA), and PJM Interconnection, L.L.C. to share information on Y2K issues.

2.2 Project Plan

The PSE&G NBU Y2K project plan (Item 2 of Documents Reviewed) was developed by the licensee to establish the scope and control of the Y2K program in the licensee's NBU, and is applied uniformly at both PSE&G nuclear power plants. The PSE&G NBU Y2K project plan is based on the guidance provided in NEI/NUSMG 97-07, which was accepted by the NRC in NRC Generic Letter 98-01 as guidance that presents one approach for achieving Y2K readiness. The audit team's review confirmed that the PSE&G NBU Y2K project plan is based on the guidance contained in NEI/NUSMG 97-07.

The PSE&G NBU Y2K project plan consists of six phases. The Identification (Inventory and Initial Assessment) Phase comprises the elements of awareness, inventory, categorization, and classification. The Detailed Assessment Phase comprises the elements of prioritization, analysis of initial assessment, vendor evaluations, utility owned or supported software evaluations, interface evaluations, and remediation planning. The Resolution Phase comprises the elements of remediation, verification, and contingency planning. The Validation Phase comprises the elements of Y2K validation testing, and contingency planning for systems failing Y2K tests. The Implementation Phase comprises the elements of planning and performing final implementation in the plant, initiating contingency plans and compensatory actions for failed or deferred acceptance tests, and decommissioning or retiring obsolete software and systems. The Closeout Phase comprises the activities that document completion of the Y2K activities for each system. The Y2K project plan also includes requirements for quality assurance, regulatory considerations, and documentation. Appendix K of the NBU Y2K project plan provides a cross reference to NEI/NUSMG 97-07. The PSE&G NBU Y2K project implementation schedule is provided in Table 1.

2.2.1 Awareness

The NBU Y2K program, which addresses both Hope Creek and Salem, was initiated in August 1997. Part of this program phase included the NBU Communication Plan: Y2K, Rev 2, dated June 6, 1998. The communication plan (Appendix I to the Y2K project plan) describes the actions necessary to inform NBU management and employees of project status, and interfaces with the PSE&G corporate Y2K compliance effort and external organizations. The communication plan prescribes actions for briefing NBU management, educating the general population of NBU personnel via departmental newsletters, training personnel who are to perform inventory and assessment activities, coordinating Y2K team communications, and reporting team progress to NBU management.

Based on communication samples reviewed by the audit team, the staff concluded that the PSE&G NBU has an effective Y2K awareness program.

2.2.2 Initial Assessment

The initial assessment part of the Identification (Inventory and Initial Assessment) Phase started on August 1, 1997, and was completed on April 15, 1998. The completed initial assessment resulted in the identification of an inventory of the software applications and embedded system components at the Hope Creek and Salem plants. The tasks of initial assessment included: (1) awareness, (2) inventory, (3) categorization, and (4) classification.

The inventory of potentially impacted applications, computer systems and hardware, and embedded plant systems/components was developed by plant personnel familiar with and responsible for each plant system/functional area using the NBU Y2K project plan. For software applications, the licensee used the inventory developed for the plant software quality assurance manual as a means for gaining additional confidence in the completeness of the inventory. Some software systems are being evaluated by the PSE&G Enterprise [corporate] Y2K project team, which supports the NBU Y2K project team through a formal memorandum of understanding.

In the identification of embedded systems, the licensee reviewed the procedures and documentation for occurrences of phrases that would indicate the existence of an internal clock or processor, surveyed the vendors for information on their equipment, performed system walk-downs, and reviewed schematics, program listings, and reference manuals on various instrumentation and control systems. The results of the initial assessment of the software applications and embedded items were placed in the NBU and Enterprise Y2K data bases.

The total inventory of potentially affected mission critical systems and components at the Hope Creek and Salem plants is 3010, including - 34 information system/information technology (IS/IT) applications, 33 stand-alone IS/IT applications, 666 infrastructure IS/IT applications, 40 digital systems, and 2237 digital components. Table 2 provides the results of the inventory of software, and Table

4 lists the mission critical digital systems. Of the 67 IS/IT applications, 32 have been verified to be Y2K compliant or ready, or are being retired. Of the 666 infrastructure IS/IT applications, 434 have been verified to be Y2K compliant or ready, or are being retired. Of the 40 mission critical digital systems, 5 have completed the resolution phase. Of the 2237 mission critical digital components, 1387 have been verified to be Y2K compliant, ready, or are being retired. The balance of the systems and components in these categories is undergoing continued detailed assessment. Table 5 lists the embedded systems and components that were reviewed by the audit team.

Prioritization

The inventory includes a prioritization of the identified items. The priority is based on mission criticality and importance of the functions being performed. The licensee defines mission critical systems or components as those systems or components that directly impact nuclear safety, power production, or current licensing bases. The licensee used risk assessment methods to prioritize each inventoried item as high, medium, or low. High priority items are items that must be verified to be Y2K compliant or ready by the deadline date. Medium priority items are those items that should be verified to be Y2K compliant or ready by the deadline date. Low priority items are discretionary items that may be verified to be Y2K compliant or ready by the deadline date. The licensee's prioritization process encompasses the criteria described in NEI/NUSMG 97-07.

Table 2 lists the prioritization of the inventoried IS/IT applications. The high priority items in Table 2 are mission critical. Table 3 provides a list of IS/IT mission critical systems and components reviewed by the audit team. Table 4 lists the inventory of mission critical digital systems in Salem Unit 1, Salem Unit 2, systems common to Salem Units 1 and 2, and Hope Creek. A total listing of digital components is too extensive, and is therefore not provided in this report. Table 5 lists the digital systems and components that were reviewed by the audit team.

Analysis of Identification Phase Activities

The licensee completed the identification phase on April 15, 1998. During the analysis of the initial assessment, the licensee evaluated the failure risk of each item as the basis for assigning the priority; recommended the approach/plan for detailed assessment, testing, and remediation; and estimated the detailed assessment/remediation cost. Unless specifically noted otherwise, the licensee did not formally assess and remediate low priority items. Remediation of these items will be done as time and resources permit. Items that are to be replaced or made obsolete before January 1, 2000, were not assessed and no remediation actions will be taken.

NRC Audit Team Assessment

The audit team reviewed in detail 21 of the 67 mission critical IS/IT applications identified in Table 2 (see Table 3). Of the 40 mission critical digital systems (see Table 4) and 2237 mission critical digital components identified by the licensee, the audit team reviewed 23 (see Table 5).

The audit team found the NBU Application Assessment questionnaire was only partially completed in several IS/IT packages. Three packages have progressed into at least the Detailed Assessment Phase, were prioritized as high priority mission critical, yet the documentation in the packages did not explicitly identify the packages as such. Additionally, Failure Modes and Effects Criticality Analysis documentation was not included in these three packages. The project manager stated that these forms were not used, and the project plan was to be updated to reflect this change.

In assessing determinations of risk, the audit team used as audit criteria the licensee's basic Y2K methodology, which was described in Appendix B to the NBU Y2K project plan. The IS/IT Y2K processes were specified in Appendix C. The audit team determined that Appendix C to NBU Y2K Project Plan (Rev. 3), "Information Systems and Technology (IS/IT)" was not consistent with the processes or focus used for assessing digital systems Y2K risks. The IS/IT processes address risk assessment as a management tool for providing standard, periodic high level reporting on the level of risk for a number of risk drivers and gives a snapshot of the progress made in resolving specific system Y2K problems. Appendix B, "Basic Y2K Methodology," uses risk assessment in terms of the impact on power production, current licensing basis, or nuclear safety. The licensee stated that this difference in defining risk has been noted, and Appendix C is to be changed to be consistent with the processes used for the digital systems risk evaluations per Appendix B.

The licensee is reviewing the impact of the above discrepancy and will correct the Y2K system assessment packages as necessary to reflect the documentation requirements of Appendix B. Nevertheless, the licensee's documentation was sufficient for justifying the results of the initial assessments of prioritization/categorization and Y2K compliance/non-compliance.

2.2.3. Detailed Assessment

Detailed assessment is performed for all high and medium priority items consisting of vendor evaluation, interface evaluation, spare parts evaluation, training system evaluation, test plans/results, subject matter experts review, and results. Vendor evaluation encompasses evaluation of available manufacturer/developer information (such as contracts, correspondence, vendor manuals, Internet listings, and vendor owners groups), communication with vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Interface evaluation includes both internal and external system interfaces for passing date- and time-related data. Test plans/results involves the development of test procedures and acceptance criteria to determine if a Y2K date

problem exists. Spare parts evaluation involves the review of items to ensure that Y2K problems are not recurrent after remediation efforts are completed. Training systems evaluations address training systems that duplicate plant systems, such as the plant simulator and considers the impact of Y2K problems on simulator existing equipment and upgrades. Subject matter expert review addresses the use of any other relevant information obtained through walkdowns, review of embedded chips, and review of source code. Results of the assessments provide remediation recommendations and justifications.

The licensee is scheduled to complete its detailed assessment in December, 1998. To date, detailed assessment has been completed on all mission critical IS/IT applications, stand alone applications, and infrastructure systems and components. Detailed assessments have been completed on 21 of 40 mission critical digital systems, and 1387 of 2237 mission critical digital components (Salem and Hope Creek). Based on the audit team's review of completed items, the audit team found that the detailed assessments performed to date follow the project implementation plan. As with the Inventory and Initial Assessment Phase, the audit team found some documentation deficiencies; however, the licensee's documentation was sufficient for justifying the results of the detailed assessments, which established Y2K compliance/non-compliance.

2.2.4. Y2K Testing and Validation

The licensee is testing all mission critical IS/IT systems, digital systems, and digital components, regardless of vendor Y2K compliance certifications. This approach is based upon the licensee's experience with changing vendor certifications over the past year. The audit team noted that the decision on whether to perform additional embedded component Y2K problem susceptibility testing is based on the licensee's determination of importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information obtained.

The licensee's Y2K project team and Y2K contractors are performing all testing to ensure consistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found inconsistencies in test acceptance criteria. On Page 25 of Phase II, Environmental Computer Based Training User Acceptance Test Package for Sequencing 99,00,01, the reason for test failure stated, "Since Access 97 windows from 00-29 and 30-99, the application fails to recognize the proper date sequence past the year 2029." The audit team found that the person performing the test interpretted '99' to be 2099 instead of 1999, which placed the '99' date outside the Access 97 windowing, and hence caused the test to fail. In this case, testing for 2099 was not applicable for Hope Creek or Salem because these plants are not licensed to operate beyond 2026 (2046 with a license extension for Hope Creek) or 2008 (2028 with license extension for Salem), respectively. Consequently, testing for a rollover from 2099 to 2100 was not appropriate. Similar test discrepancies were noted in other test packages.

As another example, in the Data Integrity testing, the Y2K test failed. The test report stated that the Access 97 windowing problem caused the failure because the proper century is not represented beyond the year 2030 or before the year 1929. The year 2000 falls between these dates, and should not have failed this test. The licensee reviewed this test and determined that the test for data integrity tested the year date for all years in the range 2000 to 2099. Again, this range of dates was not appropriate for the Hope Creek and Salem plants.

The licensee is reviewing all test documentation to ensure that the testing for rollover dates is within the time and date domain of the applications. The staff concludes that it is important for licensees to ensure that, when using contractors to perform Y2K testing, the contractors are familiar with the domain in which the applications will operate.

2.2.5. Remediation

Remediation is the process of retiring, replacing or modifying software or embedded software devices that are to be retained in service, but have been determined to be affected by the Y2K problem. The program implementation plan provided Y2K compliance criteria for replacement or modification. After remediation is completed, validation testing is required. The licensee is performing the required Y2K remediation validation testing using existing plant procedures for digital system upgrades. The final documentation of the detailed assessment and remediation is the Y2K certification package.

2.2.6. Regulatory Considerations

The PSE&G NBU Y2K project plan and associated documents include references to existing plant procedures that have guidance on regulatory considerations, such as applicability of 10 CFR 50.59 for plant modification reviews, reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.7. Contingency Planning

The licensee has begun contingency planning using a framework similar to that described in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The contingency plan for Hope Creek mission critical digital systems and components is scheduled for completion on March 24, 1999. Contingency planning for mission critical IS/IT systems is scheduled for completion on January 19, 1999. The proposed contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07. If at the

completion of the detailed assessment phase the integrated plan is implemented with the same rigor as presently applied, the audit team believes that the licensee's schedule for completion of the project contingency plans can be achieved.

2.2.8. Y2K Program Management

The licensee's Y2K program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a format that defines the progress of each Y2K system being evaluated. Additionally, the licensee summarizes the status of each phase for corporate management review. From discussions with licensee personnel, schedule slippages have resulted in immediate corporate management attention. At present, there are no schedule slippages in the Y2K program in the NBU.

2.2.9. Electric Grid Issues

The audit team discussed electric grid issues with the licensee. The licensee stated that the PJM Interconnection, L.L.C. (PJM), to which Hope Creek and Salem provide their power, is a limited liability company governed by a Board of Managers. The PJM has initiated activities to address grid reliability with respect to the Y2K problem. PJM is the largest centrally-dispatched electric control area in North America. The PJM electrical grid includes all or part of Pennsylvania, New Jersey, Maryland, Delaware, Virginia, and the District of Columbia. There are approximately 200 power producers on the grid, with a total capacity of 56,000 MW, of which approximately 13,000 MW are produced by nuclear power plants. PJM centrally coordinates the operation of these power producers by monitoring in 3-second intervals the operating status of each power producer on the grid.

The PJM also has tie lines into other grids, such as the grid serving New York City. These tie lines are closely monitored to ensure large increases or decreases in load demand do not affect the PJM grid.

The PJM contingency plans are based on the impact of changes in power production and the probability of changes in power production or demand. During the Y2K changeover period, PJM will have, online, contingency response procedures for the 20 most significant power reduction scenarios. The contingency plans are intended to be consistent between utilities in the region to ensure one utility will not adversely impact others. The contingency plans will consider probable and credible worst-case scenarios for external as well as internal events. To ensure sufficient electrical energy resources are available, the PJM utilities and power producers will operate at 75% capacity during the Y2K changeover. This will provide the PJM grid with 25% reserve load to handle load changes on the PJM grid and at the tie lines to other grids.

3.0 Audit Team Observations

The following observations were made by the team auditing the PSE&G NBU Y2K readiness program:

1. PSE&G has a common Y2K project implementation plan which establishes the scope and controls of the NBU Year 2000 Program at the licensee's two nuclear power plants (Hope Creek and Salem). The NBU Year 2000 Readiness Program is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem readiness guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The NBU Y2K readiness program is receiving appropriate management support and oversight. Effective communication of issues and program status has been established at all levels of management.
3. The licensee began the formal Hope Creek Y2K readiness program on August 1, 1997, and finished the plant inventory and initial assessment phase on April 15, 1998. The detailed assessment phase was begun January 19, 1998. The detailed assessment phase for mission critical information systems and information technology was completed September 15, 1998. The detailed assessment phase for the mission critical digital systems (embedded components) is scheduled to be completed February 24, 1999. The licensee has established a tightly controlled schedule for completing the Y2K readiness implementation phase for mission critical systems and components by September 30, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification or replacement of major critical computer systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group, Westinghouse Owners Group, EPRI, PECO, the Northeast Energy Alliance (NEA), and PJM Interconnection, L.L.C.
4. The licensee has started the PSE&G NBU Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the PSE&G NBU Year 2000 Project Plan. With proper integration of this effort in the project implementation plan and schedule, the licensee should be able to complete this effort by September 30, 1999.
5. The licensee is conducting confirmatory testing of mission critical system Y2K compliance at the plant site, regardless of vendor certifications. The licensee stated that this was necessary because some vendor certifications of Y2K compliance have not been reliable.
6. The licensee will be implementing a program in which Y2K project team members will routinely evaluate documentation packages prepared by other team members. For example, Y2K team members involved in digital systems Y2K compliance will review packages prepared by IS/IT Y2K team members. This approach is commendable and appropriate.

7. The licensee's independent assessment of the PSE&G NBU Y2K project plan was thorough. Recommendations from that assessment are being addressed by the PSE&G NBU Y2K project team for subsequent revisions of the PSE&G NBU Y2K project plan.
8. Materials management is being addressed aggressively at the PSE&G Enterprise level. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future material control.
9. Contingency planning for reactor operations is critical. Senior reactor operators (SROs) from Hope Creek and Salem have been assigned to help with Y2K contingency planning; however, a dedicated full-time lead for internal contingency planning apparently is not on board. This could impact contingency planning schedules. The licensee is pursuing this issue.

Tables and Attachments

Table 1 - PSE&G NBU Y2K Project Implementation Schedule		
Activity	**Starting date**	**Finishing Date**
Identification (Inventory and Initial Assessment)	8/1/97	4/15/98
Detailed Assessment	4/20/98	2/24/99
Resolution and Contingency Planning	5/18/98	5/24/99
Validation and Change Planning	8/21/98	7/21/99
Outage	2/21/99	4/11/99*
Implementation	10/1/98	9/30/99
Closeout	10/1/99	2/10/00**
* Some system implementations will be scheduled during the 2/21/99 outage.* Except for RDMS which is scheduled for 4th quarter of 1999 ** The PSE&G NBU Closeout activities involve only completion of required documentation.		

Table 2 - PSE&G NBU IS/IT Inventory				
	Priority			
Line of Business	**High**	**Medium**	**Low**	**Total**
Business Process Reengineering	6	0	0	6
Communications	0	0	1	1
Design Engineering	11	26	216	253
Eng Assurance/Spec Projects	0	2	6	8
Hope Creek - Operations	4	10	48	62
Human Resources	0	0	2	2
Information Technology	27	23	48	98
Licensing/Reg & Fuels	5	60	29	94
Maplewood Labs	1	6	2	9
Medical	0	1	0	1
Nuc Business Support	1	10	8	19
QA/Nuc Trng/Emerg Prep	4	14	39	57
Salem - Operations	5	11	9	25
Site Maintenance	2	13	28	43
System Engineering	1	11	10	22
Total	67	187	446	700

Table 3 - IS/IT Systems and Components Reviewed by Audit Team		
Software Applications		
File Number	**Name**	**Phase Completed**
I00076	Cable and Raceway Tracking System	II

I00263	Incore	II
I00353	Nuclide Identification	II
I00364	Outage Risk Assessment and Management	II
I00372	P1Back	II
I00449	RCS Mass Leak Rate Correction Calculation	II
I00662	Whole Body Count	II
I00295	Material Access Control Center	IV
I00029	AirCEt Easytest Diagnostics	V
I00118	Critical Software Media for ME101 Baseplate Program	V
I00124	Critical Software Media for ME035 Baseplate Program	V
I00127	Critical Software Media for ME150 Baseplate Program	V
I00138	Cymcoord	V
I00183	Engineering Work Management Systems (Including SIDS Online	V
I00186	Environmental Computer Based Training	V
I00259	InterPlot	V
I00443	Radman	V
I00458	Respirator Fit System	V
I00473	Ryansoft	V
I01344	HX-BAL	V
I02003	Fitness for Duty Computer Based Training	V

Table 4 - Inventory of Mission Critical Digital Systems

System Description	Salem 1	Salem 2	Salem Common	Hope Creek
Digital Feedwater Control System				X
Advanced Digital Feedwater Control System	X	X		
Oscillation Power Range Monitor				X
Salem Switchyard Data Acquisition and Monitoring	X	X		
Meteorological Data Acquisition and Monitoring			X	
Nuclear Security System			X	X
Overhead Annunciator System	X	X		
Fire Detection and Alarm System				X
GE Transient Analysis and Recording System				X
Plant Event and Parameter Archiving System				X
Service Water PLC Monitoring System	X	X		
Moisture Separator and Reheater PLC Indicating System	X	X		
Leading Edge Flowmeter	X	X		
Radiation Monitoring System		X		
Radiation Monitoring System				X
Nuclear Steam Supply System Process Computer				X
Emergency Response Data System			X	X
Dose Assessment Data Interface System			X	X
Control Room Integrated Display System				X
Safety Parameters Display System			X	X
Plant Computer Monitoring and Alarm System	X	X		
Auxiliary Annunciator System	X	X		
Waste Gas Monitoring and Control Recorder	X	X		
Measuring and Test Equipment			X	X
Training Center Simulator Computer Systems			X	X

Total	9	10	7	14

Table 5 - Digital Systems and Components Reviewed by the Audit Team

Digital Components and Systems		
File Number	**Name**	**Phase Completed**
D00062B1	Radiation Monitoring/Leak Detection	II
D00132B1	Emergency Response Data System, ERDS	II
D00133B1	Dose Assessment Data Interface System	II
D00145B1	M&TE Astro-Med Recorder	II
D00147B1	M&TE Astro-Med Recorder	II
D00148B1	M&TE Astro-Med Recorder	II
D00150B1	M&TE: Dranetz; Power Quality Analyzer	II
D00151B1	M&TE: Dranetz; Power Quality Analyzer, Mdl 8000-2	II
D00159B1	M&TE: HEISE, Pressure Calibrator	II
D00160B1	Safety Parameter Display System	II
D00164B1	M&TE: Datron/Wavetek, Digital Multimeter	II
D00165B1	M&TE: Datron/Wavetek, Digital Multimeter	II
D00171B1	M&TE: Panmetrics, Ultrasonic Flowmeter, Mdl PT868	II
D00172B1	M&TE: FLUKE, Calibrator, Model 5500A	II
D00173B1	M&TE: FLUKE, AC Measurement Standard, Model 5790A	II
D00173B1	M&TE: FLUKE, Calibrator, Model 5790A	II
D00177B1	M&TE:OPTALIGN, Model AL2-610-LR	II
D00188B1	Simulator System	II
D00194B1	M&TE: Yokogawa, Vortex Flowmeter, Mdl YF105	II
D00196B1	Digital Feedwater Control System	II
D00200B2	Alert Notification System	II
D0046B1	NSSS Process Computer	II
D0047B1	Control Room Integrated Display System (CRIDS)	II

Attachment 1

Phase II - Detailed Assessment

Hope Creek Y2K Audit Plan Outline

A. Project organization
B. Project Manager -
C. Project Sponsor -
1. Participation in BWR Owners Group, CDSV group activities related to the Y2K effort, (EPRI, NEI). Peer review efforts thru CDSV group. EPRI participation for embedded systems.
2. Corporate activities
3. Schedule of activities for Y2K readiness

Activity	Starting Date	Finishing Date
Communication/ Awareness		
Project Plan		
Inventory		
Detailed analysis/testing		
Remediation		
Validation/testing		
Contingency Planning		

4. Inventory

(Review the Information Database.)
Classification:

5. Analysis -
Number of items identified as Y2K compliant. Review how this was determined - Vendor data; any additional testing.
Number of items not Y2K compliant -
Accept As Is: (Review how this was determined. ___ require validation testing. Check vendor data, Owners Group data, any testing by vendor?)
Eliminate
Fix
Replace
   a) Vendor evaluation - validation testing based on criticality of item, prior experience with vendor, extent of documentation, or plant knowledge of the item
   b) Plant owned or supported software (including tools) evaluation - knowledge based decisions, scanning, testing. When testing proposed, need test specifications and procedures.
   c) Interface evaluation - Part of corporate plan (?) Grid, substation, communication,
   d) Embedded components evaluation- knowledge-based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. (Review the documents when this is the case.)
6. Remediation - Use of existing software procedures (?). Verify long-term commitments for maintaining Y2K readiness.
7. Y2K Testing and Validation
   - Assessment testing - Per Computer problem/change reports (PCRs) and associated V&V plans and test procedures.
   - Testing subsequent to remediation - unit testing; integration testing; system testing.
8. Regulatory Considerations - 10 CFR 50.59 reviews; reportability evaluations per 10 CFR 50.72, 50.73 and part 21; operability determinations.
9. Contingency Planning - NEI/NUSMG 98-07, GAO/AIMD -10.1.19
Internal Risks
External Risks
Remediation Risks (Vendor support, resource limitations, etc.)
10. Y2K Management Plan-
Tracking against milestones of the project. Management awareness. Status reporting
External resources
Use of existing procedures for software QA, configuration management, V&V.,
Documentation
Audits (any audits done/reports issued).

Attachment 2

Documents Reviewed

1. NBU Y2K Project Team (Roster of participants)
2. "PSE&G NBU Y2K Project Plan," Rev. 3, June 1998
3. "NBU Y2K Project Self-Assessment Report," October 22, 1998
4. PSE&G Status Reporting Package, Period Covering September 1998
5. Appendix C to NBU Y2K Project Plan, Information Systems and Technology (IS/IT) (Draft)
6. NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," dated October 1997.
7. NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," dated August 1998.
8. NRC Generic Letter No. 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," dated May 11, 1998.
9. "PSE&G NBU Integrated Planning and Prioritization," NC.NA-AP.ZZ-0082(Z), Rev. 1, dated June 24, 1998
10. "PSE&G NBU General Y2K Test Plan," NC.Y2-AP.ZZ-0101(Q), Rev. 1, dated August 25, 1998
11. "PSE&G NBU General Y2K Test Procedure," NC.Y2-GP.ZZ-0100(Q), Rev. 1, dated August 25, 1998
12. NBU Y2K Audit Entrance Meeting Slide Handouts
13. Slide Handouts, "Operating Plan, Preparations for Y2K"

Attachment 3

Entrance Meeting - Attendees

October 26, 1998

Joanne Carter	NBU Y2K Project, IS/IT
Don Crouch	Materials Manager
Bob Green	PSE&G Y2K Project Manager
Ashok Hasija	NBU Y2K Project Engineer
Kathy Master	NBU Y2K Project, Admin Support
Jim Metro	NBU Y2K Project, Digital Lead
Peter Moeller	Licensing
Ray Moore	NBU Y2K Project Manager
Gary Overbeck	Director - Engineering Assessments/Special Projects
Dennis Pease	QA/NSR
Becky Recchione	Digital
Glen Rogers	Vice President - Information Technology - PSEG
Dave Scull	NBU Y2K, IS/IT
Jim Shank	Design Engineering - Digital
Bert Simpson	Sr. Vice President - Nuclear Engineering
Skip Sindoni	Communication
Lou Storz	Sr. Vice President - Operations
Dave West	Purchasing
Anne Williams	IS/IT Corp.
Ron Dowdney	Y2K Project Scheduling
David Garchow	Director, Design Engineering
Tom Gordon	IS/IT
Jack Gibson	PECO Energy
Phil Duca	Salem Licensing
Mike Waterman	NRC
Mario Gareri	NRC
Neil Della Greca	NRC

December 1, 1998

Mr. John K. Wood
Vice President - Nuclear, Davis-Besse
Centerior Service Company
c/o Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: YEAR 2000 READINESS AUDIT REPORT, DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 (TAC NO. MA1829)

Dear Mr. Wood:

Enclosed is the Year 2000 Readiness Audit Report which documents the results of the Office of Nuclear Reactor Regulation audit conducted at your facility from October 27 through October 29, 1998.

Please contact me if you have any questions regarding this matter.

Sincerely,

Allen G. Hansen, Project Manager
Project Directorate III-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-346

Attachment: As stated

Attachment

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
AUDIT REPORT
ON
IMPLEMENTATION OF GENERIC LETTER (GL) 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-346
License No:	NPF-3
Licensee:	Toledo Edison Company Centerior Service company and Cleveland Electric Illuminating Company
Facility:	Davis-Besse Nuclear Power Station
Location:	Oak Harbor, Ohio 21 Miles ESE of Toledo, Ohio
Dates:	October 27, 1998 - October 29, 1998
Audit Team Members:	Deirdre Spaulding, NRR W. Keith Mortensen, NRR
Approved by:	Jared S. Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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- Executive Summary
- 1.0 INTRODUCTION
- 2.0 Davis-Besse Project Description

- 2.1 Project Organization
- 2.2 Project Plan
  - 2.2.1 Awareness
  - 2.2.2 Initial Assessment
  - 2.2.3 Detailed Assessment
  - 2.2.4 Y2K Testing and Validation
  - 2.2.5 Remediation
  - 2.2.6. Regulatory Considerations
  - 2.2.7 Contingency Planning
  - 2.2.8. Y2K Program Management
  - 2.2.9 Electrical Grid Issues
- 3.0 Audit Team Observations
- Tables

Executive Summary

From October 27 through October 29, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Davis-Besse Nuclear Power Station. The purpose of the audit was to (1) assess the effectiveness of the the licensee's programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the Davis-Besse Year 2000 Project Plan (Davis-Besse Y2K readiness program) and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the audit team's assessment and evaluation of the Davis-Besse Y2K readiness program, the following findings were made:

1. The Y2K project team appears to have remained on schedule in spite of some new responsibilities required associated with the merger of the utility with another that took place in the Fall 1997.
2. The audit team reviewed several files pertaining to the software and firmware that have been identified by the licensee as part of the Y2K problem review. Only 14 firmware items still have Y2K susceptibility yet to be determined. These 14 items are in classifications ranked less mission critical and less important to the objectives of the Y2K project for achieving plant readiness. The team determined that this reflected favorably upon the work remaining to be done on the firmware items.
3. Davis-Besse is an older-vintage plant and, therefore, less of its control logic is implemented in digital systems. This is especially true for the safety-related systems. No Y2K problems were found in any of the limited amount of software classified as safety-related.
4. The Davis-Besse Y2K Project Plan follows the guidance provided in NEI/NUSMG 97-07.
5. The audit team was informed that Davis-Besse will not be Y2K ready by July 1, 1999 due to the activities related to the Security Data Management System, which is currently scheduled for completion on July 30, 1999. However, time is available to achieve readiness of this system and alternative access control measures will be provided should the system not be ready to support plant operation on January 1, 2000.
6. Y2K awareness at Davis-Besse has been ongoing and the issue of the Y2K problem will be incorporated into operator training that will take place in 1999.
7. The audit team interfaced with Davis-Besse Y2K project team personnel who where found to be very knowledgeable and aware of the Y2K activities of which they have ownership.
8. The audit team found that senior corporate management strongly supports Davis-Besse in their efforts to address Y2K readiness.
9. The audit team believes that the licensee will meet their Y2K readiness date for Davis-Besse as planned.

1.0 INTRODUCTION

The objectives of the Davis-Besse Nuclear Power Station (Davis-Besse) Y2K program audit were to:

1. Assess the effectiveness of the licensee's program for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems.
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999.
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan (http://www.nrc.gov/NRC/Y2K/y2kaudit.html) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL-98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team reviewed a version of the Davis-Besse Year 2000 Project Plan at the Framatome office located in Rockville, Maryland. Upon commencement of the audit, a copy of the Davis-Besse Year 2000 Project Plan (document 1 of Attachment 1) was made available by the licensee in their Davis-Besse Y2K Information binder dated October 27, 1998.

The audit began with an entrance meeting attended by licensee representatives, the Davis-Besse Y2K Sponsor, the Y2K Project Manager, Davis-Besse Y2K Team members and other plant personnel, and members of the audit team. Attachment 2 is a list of the attendees. Members of the Davis-Besse Y2K organization described project organization, the project plan, implementation, and current status.

Subsequent to the entrance meeting, the audit team reviewed the Davis-Besse Y2K Project Plan, associated project documentation, and communicated with Davis-Besse personnel on an on-going basis to address questions as they arose. The documents reviewed are listed in Attachment 1.

2.0 Davis-Besse Project Description

2.1 Project Organization

The Davis-Besse Y2K Project Plan organization consists of the following roles:

(1) The Y2K Project Sponsor is the Director, Davis-Besse Engineering and Services

(2) The Project Manager is the Supervisor, Computer Engineering. The Y2K Project Manager is responsible for overseeing all activities associated with the Y2K project through the implementation of a Y2K Team. The project manager ensures that all systems are classified and prioritized according to the established Y2K guidelines.

(3) The Y2K Team consists of a Senior Reactor Operator, technical specialists and support staff from each section. The project team incorporates the skills and experience of a cross-section of the organization. The system engineers, technicians, and subject matter experts serve as the process owners. Additionally, information technology, engineering, licensing, quality assurance, and procurement specialists are part of the Y2K Team. The Y2K Team members are responsible for coordinating information and activities for the portions of the program for which they have ownership. The Y2K Team is also responsible for developing the tools needed to complete the associated activities. Y2K Team members assist in the identification, classification, and prioritization of the Y2K program items/components.

(4) The Davis-Besse Y2K project plan has the approval of the Vice President Nuclear Davis-Besse, and Davis-Besse Directors.

The Davis-Besse licensee participates in information sharing activities related to the Y2K effort with other organizations. Davis-Besse is involved with the B&W owners group, NEI, NUSMG, EEI, EPRI, and NERC. Additionally, Davis-Besse personnel have been involved in peer review activities with staff from the Perry Nuclear Plant. The licensee uses an energy management system (EMS) which is a GE Harris product and participates in the GE Harris users group. The EMS is maintained at the corporate level.

2.2 Project Plan

In November 1997, a company merger took place resulting in FirstEnergy Corporation becoming the owner of each licensee for Davis-Besse. As part of the merger process, many of the Davis-Besse computer systems were allocated funds for upgrading. These upgrades were specified and confirmed to be Y2K compliant and are, therefore, not included in the Y2K readiness program. Other Davis-Besse systems/components/equipment were allocated funds specifically for addressing the Y2K problem.

The Davis-Besse Year 2000 Project Plan as described in the Y2K Information binder dated October 27, 1998 is the plant specific Y2K readiness plan developed by the licensee. The Implementation Plan includes: (1) initial assessment which encompasses the steps of inventory, classification, and prioritization, and (2) detailed assessment which encompasses the steps of vendor evaluation, utility owned or supported software evaluation, Y2K susceptibility testing , and readiness planning. Subsequent efforts include remediation, validation (testing)/implementation and contingency planning.

The schedule of activities for Y2K readiness is shown in Table 1.

2.2.1 Awareness

The Davis-Besse licensee initiated Y2K awareness with a site wide memorandum. A memorandum sent out early in the Davis-Besse readiness project initiated the identification and inventorying of all computers, software and embedded systems. Awareness at Davis-Besse is an on-going process. Several methods of communication are used to maintain Y2K awareness. The communication methods include site wide meetings, site wide memoranda, corporate newsletters, a Davis-Besse web site, training on embedded systems per the guidance in EPRI TR-11189, and status updates for operations staff. According to Davis-Besse personnel, operator requalification training to be held in 1999 will include Y2K issues.

The Davis-Besse Y2K project planning began in early 1997 when plant personnel began to provide First Energy Corporation (Corporate) with a list of the Davis-Besse software inventory. This software inventory was needed as part of the transition process to support the company merger. This merger was completed in the Fall of 1997.

Items or components that are purchased by the licensee (subsequent to the Y2K inventory/assessment that has already been completed) are captured and assessed for Y2K readiness at the procurement phase. There is a boilerplate questionnaire that goes to the vendors which asks if the product is Y2K compliant/ready. The licensee uses a procedure for software/hardware procurement which addresses Y2K concerns.

At Davis-Besse, each systems engineer compiled the embedded system inventory for those systems for which they had ownership. The "system expert" is the system engineer. System engineers identified their systems that contained microprocessors. Davis-Besse still has many of the original analog based systems in place. No Y2K problems have been identified in safety-related systems at Davis-Besse.

The security data management system (SDMS) at Davis-Besse is being replaced with a Y2K compliant system. The project scope includes two dual redundant DEC Alpha CPUs, new intelligent multiplexers which will replace the current Sygnetron security system. The project was approved in 1995, and completion is scheduled for July 30, 1999. An alternative access control system is being planned in the event the replacement security computer is not ready in time to support plant operation on January 1, 2000.

The Davis-Besse Y2K Readiness schedule is provided in Table 1.

2.2.2 Initial Assessment

The initial Y2K assessment consisted of several steps including inventory, classification of the inventory, and prioritization of the identified items. All software items and embedded systems that are in use at Davis-Besse were identified and input to a database for which Davis-Besse generates, a "Software Classification Report," "Software Status Report," "Firmware Classification Report," and "Firmware Status Report."

An inventory was performed of all potentially affected items. A memorandum was issued to all supervisors to provide them with guidelines for obtaining input to the database from all areas of the plant. System engineers were requested to complete a system review for all Davis-Besse systems. This review documented whether the systems do or do not contain software, firmware, or microprocessors. The Davis-Besse Y2K Team developed forms that were used to facilitate and standardize the collection of data. The information collected included software or device name, version or model number, description and use, vendor or manufacturer, Davis-Besse owner or support group. The forms also gathered information regarding the item's importance to safety, plant operability, regulatory commitments, and business considerations. The data collected were used to make initial decisions on classification and prioritization. The data were also used to determine budget and resource estimates for the detailed assessment phase.

The licensee classified the Davis-Besse inventoried items into seven categories by rank of importance to the objectives of the Y2K project as follows:

1. Safety-Related - "Q" per Davis-Besse Configuration Equipment System and performs a safety function
2. Important to Operation - The date dependency impacts systems important to plant operation
3. Required by Regulatory Commitments - The date dependency impacts a system that implements regulatory commitments
4. Important to Personnel Safety - The date dependency impacts systems important to safety of plant personnel
5. Required to Support Business (High Priority) - The date dependency could cause substantial financial/business impact
6. Required to Support Business (Low Priority) - The date dependency can cause some financial/business impact
7. Desirable (but not required) -The date dependency can cause minor financial/business impact, but is not a priority

Prioritization was the process of reviewing all items within the inventory after classification and assigning an order to the performance of the detailed assessment. The licensee assigned priorities according to the following criteria:

1. Needs to be evaluated/tested in refueling outage (RFO) number 11 (RFO11 was in the spring of 1998).
2. Needs budget/expenditures authorization.
3. Analyze for Use-As-Is.
4. Standard Testing - work under Maintenance Work Order or Request For Computer Assistance.

The team finds that the licensee's initial assessment, which was completed on June 30, 1998, encompassed the criteria described in NEI/NUSMG 97-07.

2.2.3 Detailed Assessment

The purpose of Davis-Besse's detailed assessment phase is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Written checklists are used to capture the detailed assessment process and provide for documentation and quality assurance of the work performed. Assessment results are used to make decisions regarding actions required to ensure the continued operation of the software or equipment. The following activities occur during the detailed assessment phase: vendor evaluation, utility owned or supported software evaluation, Y2K susceptibility testing, and readiness planning.

The detailed assessment is scheduled for completion on April 20, 1999.

The Davis-Besse Y2K Team developed a Vendor Assessment questionnaire and a cover letter that has been sent to all vendors of software, firmware and equipment with an embedded microprocessor. The vendor correspondence is being tracked, along with other steps of the Y2K readiness plan, on a database maintained by Computer Engineering. The readiness plan states that for vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on failure impact, extent of documentation provided, confidence in the vendor, and the licensee's knowledge and experience with the product.

The licensee scheduled some items for replacement irrespective of the year 2000 issue (for example some items/systems were obsolete). The replacements will be Y2K compliant. In some instances the replacement schedule was accelerated in order to meet the needs of the Y2K schedule. The replaced items will require no further testing or evaluation. Procurement Engineering at Davis-Besse has developed a statement for Year 2000 compliance to be included in each purchase order from this time forward.

The licensee is performing an assessment of the Corporate or Computer Engineering supported applications and devices using the same checklists as stated above. The licensee's methods for determining Y2K readiness of applications and devices include knowledge-based decisions, scanning of code (used for mainframe and some large client server applications), and testing.

The licensee has assessed the Y2K readiness status of the inventory of firmware and software items as shown in Tables 2 and 3. The column headings are; (1) "Remediation Not Required," (2) "Remediation Scheduled, or (3) "Y2K Impact To Be Determined." The items in Tables 2 and 3 are further divided into the seven classifications by rank of importance to the objectives of the Y2K project. Table 2, "Firmware Inventory and Inventory Assessment," shows the Y2K readiness status of the 106 firmware items that were identified. Table 3, "Software Inventory and Inventory Assessment," shows the Y2K readiness status of the 285 software items that were identified.

Tables 4 and 5 list the items that were reviewed in detail by the Audit Team. The team reviewed the folders for 44 firmware items and 19 software items. The tables provide the classification and the licensee's recommended remediation for each of the folders reviewed.

Below is a brief discussion of the following firmware/software items reviewed by the audit team:

- Dixson digital indicators are used in 62 plant locations. They have no time-dependent operations and do not interface with other equipment or systems. Therefore, they are Y2K compliant. The vendor stated that they are Y2K ready.
- Framatome Saturation Meter (TSAT) is used to determine the subcooling margin. It interfaces with other instruments and equipment. It performs no time-dependent calculations or operations. It does not use batteries for retention of default or setup information and it has no form of date input or date check. Therefore, it is Y2K compliant. The vendor stated that it is Y2K ready.

- The audit team found the response from Amalgamated Services Incorporated (ASI/Kaman) concerning their microprocessor-based radiation monitoring systems to provide a useful and accurate status of the vendor's evaluation and testing of their products. These systems are used at Davis-Besse to monitor releases to the public and to isolate control room normal ventilation to prevent potential radiation exposure to control room personnel. The vendor's response includes a discussion of the circuit boards and system components and provides the vendor's bases for concluding that the system is Year 2000 ready.
- The Spec 200 Micro microprocessor-based display and analog-based control system by Foxboro is used in the auxiliary feedwater system. The vendor response indicates that the equipment has no date sensitivity and is, therefore, Y2K ready.
- An Allen Bradley SLC500 programmable logic controller (PLC) is used in the moisture separator, reheater and demineralizer system. It is not date sensitive and the vendor stated that it is Y2K ready. It will be used as is.
- The Computer Board Octagon system SYS-3Z (SASS) has no real-time clock and no date or time is used in the SASS program. It is, therefore, Y2K ready.
- The Framatome Diamond Power Intel 710127-1042 CRD Programmable Controller programmer model 469A has no real-time clock and no date or time is used in the program. It is, therefore Y2K ready.
- The MODCOMP CL III/95, plant process computer system, has an upgrade scheduled for December 1998. There are no date/time dependencies, and a 4 digit year is used in the upgrade software. All MODCOMP developed software is Y2K compliant.
- The Orion Research Incorporated 811 pH meter is Y2K ready according to the vendor. This meter is used to perform pH measurement of various plant fluid systems. Data obtained from these meters may be used as a basis for chemistry control decisions of these systems.
- The Rosemount Low Conductivity Microprocessor Analyzer and 3051P Smart Transmitter have no date sensitivity and each is Y2K ready.
- The Simplex 4100 Fire Panel Programming Software and the Simplex 4190 Color Graphic Unit (operator's display) have not yet been fully tested by the licensee, and testing must be complete before the licensee can determine the display's Y2K readiness. The Color Graphic Unit provides the operator with a display for general interface to the fire system. It also provides an online test of the pre-fire plans. The 4100 Software is required to program the Simplex fire panel display. The Audit team observed a portion of the testing of this display.
- According to the vendor, the Eagle Signal Controls CX302A6 and CX312A6 Timer/Counter have no date sensitivity and are Y2K ready.
- Tri-Carb A2100TR has a vendor scheduled release date of their Y2K ready product of February 1, 1999. The vendor intends to make available software upgrades for as many of its instruments as possible. Software updates will use the fixed window technique. The licensee will install the upgraded software at Davis-Besse.
- The AVVU calculates doses for gaseous releases from non-routine release points such as the atmospheric vent valves and auxiliary steam reliefs. This device is being retired and the functions will be included as a part of other systems.
- Auto Ion 300 is software that operates the Dionex Online Ion Chromatographs. This software will be upgraded to be Y2K compliant.
- The BCT 2000 software used for battery capacity testing, per vendor letter is not year 2000 compliant, however, new software will be available before April 1, 1999.
- The CDM Calibrator Software provided by Merlin-Gerin is currently not year 2000 compliant and is under revision. Y2K compliance has been specified in the software requirement specification for the product. The updated software was released in the 3rd quarter of 1998.
- The Chemistry Data Acquisition and Management System handles secondary data acquisition and reporting. This product is not year 2000 ready and will be replaced.
- The RMAS, reactivity analysis and measurement system, automates most of the calculations performed during zero power physics testing. This product is not Y2K ready, however, the vendor has developed a solution that is to be available in the 4th quarter of 1998.
- VOTES for DOS is a valve operation and testing software for motor operated valves. A new version of software is being developed by the vendor.
- The DynaTech Frontier System 1000/2000 is software used for whole body radio-analysis. The original vendor is no longer in business, and thus, this system is being replaced.
- HIS-20 provides radiologically restricted area access control, monitoring, and reporting. A Y2K compliant version will be provided by the vendor.
- The MSHIELD, calculates radiation shielding effectiveness. Version 3.09 is not Y2K ready, however the most recent version is Y2K compliant.

2.2.4 Y2K Testing and Validation

Y2K testing is performed to determine whether the software (including systems with embedded software/firmware) is subject to the Y2K problem, and this testing is performed during the detailed assessment. Y2K testing performed subsequent to remediation verifies whether the remediation efforts have eliminated the Y2K problem and confirms that no unintended functions are introduced in the modified system.

The Davis-Besse licensee uses existing procedures to perform and document the Y2K susceptibility and remediation testing. Any testing that is performed outside the scope of the Maintenance Work Order process is to be completed and documented using the Request for Computer Assistance.

The Audit Team observed the Y2K susceptibility testing of the fire protection panel. The team observed the tests for the critical dates pertaining to the transition from 12/31/1999 to 1/1/2000 and from 2/29/2000 to 3/1/2000. For these two transitions, the system operated successfully.

2.2.5 Remediation

The purpose of remediation is to replace, fix, or eliminate items identified in the assessment. Remediation includes activities that make the item Y2K compliant or ready. At Davis-Besse, remediation is the process of replacing or modifying software or devices that are to be retained in service, but have been determined to be susceptible to the Y2K problem. Existing Davis-Besse software quality assurance and configuration management procedures are applied to remediated systems.

Remediation is scheduled for 26 firmware items, and 59 software items. Remediation is not required for 66 firmware items and 101 software items.

2.2.6. Regulatory Considerations

In implementing the Davis-Besse Y2K Project Plan, the licensee makes use of existing programs and policies to ensure that appropriate regulatory reviews and evaluations are performed and documented. These reviews include 10 CFR 50.59 reviews for any modifications; reportability evaluations per 10 CFR 50.72, 50.73 and 10 CFR 21, and operability determinations as required by technical specifications.

2.2.7 Contingency Planning

Davis-Besse's contingency planning began on June 30, 1998 and is scheduled to be completed June 1, 1999. A complete integrated contingency plan will result from two main tasks, (1) establishing the readiness checklist for individual contingencies, and (2) initiating the risk management matrix.

The contingency plan addresses three areas of potential risk; internal facility risks, interfacing risks, and external risks. At Davis-Besse each component that is important to reactor safety has preplanned strategies for addressing potential failures. These strategies are described in the station offnormal and abnormal procedures. The goal of the Y2K contingency plan is to use the existing procedures/tools as the bases of the contingency planning effort. Mitigation strategies will be developed for each failure that is characterized as being significant to risk and uninterrupted station operations. The licensee will pay particular attention to those Y2K problem failure scenarios that are not currently addressed by an existing emergency procedure.

In accordance with the guidance in NEI/NUSMG 98-07, there is one single point of contact for the contingency planning process. Additionally, the overall contingency planning effort includes a cross section of Davis-Besse personnel as well as corporate involvement. Corporate level input addresses major risks to company operations as a result of postulated Y2K failures at Davis-Besse. In addition to the use of existing emergency off normal and abnormal station procedures, the licensee uses the Davis-Besse radiological emergency plan, and the emergency operating plan as the basis for response to Y2K contingencies. Furthermore, lessons-learned from the experience of the June 24, 1998 alert when a tornado struck the Davis-Besse station and surrounding community are being used in the Y2K contingency planning. The June 24, 1998, tornado caused a loss of offsite power for 23 hours, loss of offsite communications, a reactor trip, loss of station switchyard, and damage to several station structures.

2.2.8. Y2K Program Management

The Davis-Besse Y2K readiness project requires the commitment of senior management and their organizations. Furthermore, the commitment of Davis-Besse personnel who are knowledgeable of the systems and areas that they have ownership is evident. At present, the licensee is on schedule to achieve Y2K readiness for Davis-Besse by July 30, 1999.

Team members observed that quality assurance (QA) measures and oversight applied to the Y2K project is performed in accordance with the licensee's existing procedures and that these measures ensure that the level of oversight is appropriate. The responsibility for the implementation of the QA measures remains with the Y2K project team. Oversight in the form of QA audits is provided by individuals or groups are not directly involved in the management or performance of Y2K project activities. Additionally, the NRC senior resident inspector at Davis-Besse is included on the distribution of the reports of any independent QA audits including those of the Y2K readiness program.

The audit team found that program management measures conform to the guidance of NEI/NUSMG 97-07 and are adequate. The licensee is planning an independent QA audit of the Y2K readiness program by the first quarter of 1999.

2.2.9 Electrical Grid Issues

First Energy Corporation is involved in an on-going interface at the regional, interregional and national levels to ensure grid stability for the Y2K problem The solid state relays used in the substation controls and to provide power system protection will perform their critical function because they are electromechanical devices (not software) and are not date sensitive. PLCs used in some power distribution functions are still being assessed for Y2K problem susceptibility. The microwave and fiber optic systems used for wide area communication are not Y2K impacted, however, additional verification of this determination is being obtained.

3.0 Audit Team Observations

1. Davis-Besse was merged into FirstEnergy Corporation in November of 1997. The audit team observed that the Y2K project team has remained on schedule in spite of the uncertainty and new responsibilities that often accompany such a significant change in corporate organization.
2. The audit team reviewed several files pertaining to the software and firmware that have been identified by the licensee. Of the 106 firmware items, 66 items require no remediation. Most of these 66 are not date sensitive and will be used as is. An additional 26 of the 40 remaining items are scheduled for replacement. These 26 require no further study. Only 14 firmware items still have Y2K susceptibility yet to be determined. These 14 items are in classifications 5, 6, or 7, that is, the classifications ranked less mission critical and less important to the objectives of the Y2K project for achieving plant readiness. The team viewed this status favorably since no significant effort remains for the firmware inventory.
3. Davis-Besse is an older-vintage plant and, therefore, there is limited use of digital systems in mission critical application. This is especially true for safety-related systems. No Y2K problems were found in any of the limited amount of software classified as safety-related.
4. The Davis-Besse Y2K Project Plan follows the guidance provided in NEI/NUSMG 97-07 for Y2K readiness. The Davis-Besse Y2K planning and organization includes the integration of a cross-section of plant personnel. The areas of contingency planning and quality assurance are being effectively addressed by the licensee.
5. The audit team notes that Davis-Besse will not be ready by July 1, 1999 as prescribed in GL 98-01, due to the activities related to the Security Data Management System, which is currently scheduled for completion on July 30, 1999. However, the audit team determined that sufficient time is available to achieve plant Y2K readiness to operate on January 1, 2000, and in the event the security computer upgrade is not completed, an alternative means for access control has been developed.
6. Y2K Awareness at Davis-Besse has been ongoing and the issue of the Y2K problem will be incorporated into the operator training that will take place in 1999. The licensee has been engaged in exchange of information on the Y2K problem through interaction with other plants, and industry groups. The audit team believes that the on-going awareness at the site and exchange of information among other organizations has and will positively contribute to the licensee achieving Y2K readiness for operation on January 1, 2000.
7. The audit team interfaced with Davis-Besse Y2K project team personnel who were found to be very knowledgeable and aware of the Y2K activities for which they have ownership. Additionally, the audit team witnessed a demonstration of the use of the Y2K susceptibility test procedure which demonstrated that key rollover dates are effectively tested.
8. The audit team found that senior corporate management (FirstEnergy Corporation) strongly supports the Davis-Besse plant Y2K team in their efforts to achieve Y2K readiness. The needed resources have been made available and will continue to made available to Davis-Besse so that Y2K readiness will be achieved as planned.

Based on the above observations, the audit team believes that the licensee will meet their Y2K readiness date for Davis-Besse as planned.

Tables

Table 1 - Davis-Besse Y2K Project Plan Schedule		
Activity	Starting Date	Finishing Date
Communication Awareness	September 1997	1st quarter 1999
Y2K Readiness Project Plan	1st quarter 1997	June 1998
Inventory	September 1997	June 1998
Detailed Assessment/Testing	April 1998	April 1999
Remediation	September 1997	July 1999

Validation/Implementation	February 1999	July 1999
Contingency Planning	June 1998	June 1999

Table 2
Firmware Inventory and Inventory Assessment

Classification	Remediation Not Required	Remediation Scheduled	Y2K Impact To Be Determined	Total
Safety Related	9	0	0	9
Important to Operation	18	12	0	30
Required by Regulatory Commitments	5	4	0	9
Important to Personnel Safety	0	0	0	0
Required to Support Business (High Priority)	3	1	4	8
Required to Support Business (Low Priority)	27	8	9	44
Desirable (but not required)	4	1	1	6
Firmware Total	66	26	14	106

Table 3
Software Inventory And Inventory Assessment

Classification	Remediation Not Required	Remediation Scheduled	Y2K Impact To Be Determined	Total
Safety Related	3	0	0	3
Important to Operation	15	6	15	36
Required by Regulatory Commitments	16	14	34	64
Important to Personnel Safety	0	0	1	1
Required to Support Business (High Priority)	12	14	17	43
Required to Support Business (Low Priority)	24	11	31	66
Desirable (but not required)	31	14	27	72
Software Total	101	59	125	285

Table 4
Software

The following software items were reviewed by the audit team.*

Classification	Item Name - Description	Date Sensitive	Status - Replacement Plan

Safety Related	Auxiliary Feedwater S/G Level Control Foxboro Spec 200 Micro-measures input variables and provides signal to valves for S/G level control	No	close out - Y2K ready
	Kaman Radiation Monitoring 451145-001D-monitors station vent and containment atmosphere for gaseous particulate and iodine activity during normal and post accident conditions.	No	close out - Y2K ready
	Kaman Radiation Monitoring 451146-001	No	close out - Y2K ready
Important to Operation	Chemistry Data Acquisition and Management System - a series of programs for secondary water chemistry data acquisition and reporting.	Yes	replace
	Reactivity Analysis and Measurement System - used by Reactor Engineering during zero power physics testing	Yes	replace - vendor to provide upgrade
Required by Regulatory Commitments	AVVU - calculates non-routine gaseous releases from points such as the atmospheric vent valves (AVV's) and auxiliary steam reliefs	Yes	replace (product retired)
	Auto Ion 300 - software to operate Dionex Online Chromatographs	Yes	replace
Required by Regulatory Commitments	BCT-2000 - Battery capacity test system software for performance discharge and service testing of all large batteries by controlling a discharge load bank.	Yes	replace
	VOTES for DOS - Motor operated valve diagnostic and evaluation system	Yes	replace - vendor providing new version of software
	Dionex AI-450 - software to operate Dionex ion Chromatographs	Yes	replace
	HIS-20 - radiologically restricted area access control, monitoring and reporting	Yes	replace - vendor to provide upgrade
	PROTEST III - integrated software system used in testing, calibrating and maintaining protective relay devices	Yes	replace with vendor provided compliant version
	Tri-Carb A2100TR - software to update Liquid Scintillation Analyzer	Yes	closed - vendor provided upgrade
Required to Support Business (High Priority)	Data Manager - mass storage software for VOTES for DOS	Yes	replace
	Valve Vision - measures valve packing load	Yes	replace

Required to Support Business (Low Priority)	CDM Calibrator Software (Merlin-Gerlin) - calibrates and checks operation of electronic alarming dosimeters. This software is part of a vendor supplied calibration system.	Yes	replace with vendor provided revision
Required to Support Business (Low Priority)	Dyna Tech Frontier System 1000/2000 quantitative fit test booth, fit test for respiratory equipment, whole body radio analysis software	Yes	replace
	MSHIELD (microshield) version 3.09 calculates radiation shielding effectiveness)	Yes	replace - must upgrade to more recent version (MSHIELD 5.09)
	Doric Digitrend - records heat trace temperature	Yes	closed
* The licensee used the term "close" to refer to reviews which were completed and all review approved signatures obtained. The licensee used the term "closeout" to refer to reviews which were completed but still needed review approval signatures.			

Table 5
Firmware

The following firmware items were reviewed by the Audit Team.

Classification	**Instrument Name (Vendor)**	**Date Sensitive**	**Recommended Remediation**
1 - Safety Related	Digital Indicators - 62 locations - (Ametek/Dixson)	No	None required
1	Saturation Meter - TSAT - (Framatome)	No	None required
1	Digital Display - TSAT - (Newport Electronics)	No	None required
1	Flow Monitoring System (Technology for Energy Corp)	No	None required
1	Microprocessor - Radiation monitoring - (ASI/Kaman)	No	None required
1	Microprocessor Display and Analog Control System (Foxboro)	No	None required
2 - Important to Operation	Microprocessor-based Underfrequency Relays (ABB Service Inc.)	No	None required
2	SLC500 PLC (Allen Bradley)	No	None required
2	Model 21X Data Loggers (Campbell Scientific Inc.)	Yes	None required
2	Series 35 PLUS/FASTSCAN for HPGe (Canberra Industries)	Yes	Replace
2	Micro processor SAC2 control (Cooper Turbo Compressor)	Yes	None-required
2	SPDS Terminals (Cutler-Hammer)	unknown	Replace
2	Micro Vax II (Digital Equipment Corp.)	Yes	Replace

2	NAS Server (Digital Equipment Corp.)	Yes	Replace
2	Alpha 4000-710 (Digital Equipment Corp.)	Yes	Replace
2	Alpha 3300LX (Digital Equipment Corp.)	Yes	Replace
2	8800 MX MODACS Cards (Electronic Visions, Inc.)	Unknown	Replace
2	Computer board OCTAGON (Framatome)	No	None required
2	Computer board OCTAGON EPROM (Framatome)	No	None required
2	CRD Programmer Controller (Framatome)	No	None required
2	CL III \ 95 (MODCOMP)	Yes	Replace
2	811 PH Meter (Orion Research, Inc.)	No	None required
2	Low Conductivity Microproc. Analyzer (Rosemount)	No	None required
2	3051P Smart Transmitter (Rosemount)	No	None required
2	Security Sys. - SDMS (SAIC)	Yes	Replace
2	4100 Fire Panel Programming Software (Simplex)	Yes	TBD
2	HD310 System with time Code Generator TG319 (Validyne)	Yes	Replace
3 - Required by Regulatory Commitments	BCT-2000 Battery Load Bank (Alber Corp.)	Yes	Replace
3	8100 On-line Chromatograph (Dionex Corp.)	Unknown	Replace
3	Respirator Fit Booth (Dyna Tech Frontier)	Unknown	Replace
3	CX302A6 and CX312A6 Timer/Counter (Eagle Signal Controls)	No	None required
3	Model 3400 Printer (Intermec)	No	None required
3	Hand-held units for data loggers (Intermec)	Yes	TBD
3	Breath Alcohol Tester (Midwest Instruments)	Unknown	TBD
3	Liquid Scintillation Analyzer (Packard Instrument Co.)	No	None required
5 - Required to Support Business (High Priority)	Reactor Cooling Pump Monitor (Framatome)	Yes	Replace
5	Ultrapure Water Monitor (Martek Instruments, Inc.)	No	None required
5	Conductivity/pH Monitor (Martek Instruments, Inc.)	No	None Required
6 - Required to Support Business (Low Priority)	Whole Body Counter (Canberra)	Yes	Replace

6	Auxiliary Boiler Flame Controller (Fireye, Inc.)	No	None Required
6	DMC90 Digital Alarming Dosimetry (MGP Instruments)	Unknown	TBD
6	E-PROMS in Perimeter Detection Equipment (NSSC)	Unknown	TBD
6	1151S Smart Pressure Transmitter (Rosemount)	No	None Required
7 - Desirable (but not required)	275 Hart Handheld Communicator (Rosemount)	Unknown	Replace

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Attachment 1

Documents Reviewed

1. Davis-Besse Year 2000 Project Plan as provided in the Davis-Besse Y2K Information- Year 2000 Project Davis-Besse Nuclear Power Station- NRC Audit October 27, 1998.
2. Davis-Besse NPS Y2K Contingency Plan Revision 0 as provided in the Davis-Besse Y2K Information- Year 2000 Project Davis-Besse Nuclear Power Station- NRC Audit October 27, 1998.
3. Selected Portions of Davis-Besse Nuclear Quality Assurance Manual, Rev. 46, dated 10/20/98
4. Selected Portions of Nuclear Group Procedure,"Audits and Surveillances," dated 4/27/98

Attachment 2

Entrance Meeting Attendees

NAME	TITLE	DEPT./ORGANIZATION
John K. Wood	VP	VP
Bob Donnellon	Dir-Eng-SER	Eng & SERV
Frank Swanger	Mgr-DB Eng	Eng & SERV
Greg Hayes	Supv. Comp. Engrg.	Eng & SERV
Bob Horland	Senior Engineer	Eng & SERV
Matthew Selmek	I&C Technicial	Maint/I&C
Skip Cope	Senior EP Sepc.	EP
Karen Dunn	Y2K Project Coord.	Computer Engineer
David A. Richards	Manager	Internal Auditing Dept.
Connie J. Moore	Dir, NEI	IS
John G. Waddell	Sup - Security Shift	Nuclear Security
Jim Wilson	ISO Y2K Proj.	ISO - Akron
Deirdre Spaulding	Electronics Engineer	NRC/NRR/HICB
David Lockwood	Supervisor	Reg. Affairs
Brad Demaison	Supervisor - NT	Training
Dale R. Wuokko	Supervisor-lLicensing	Regulatory Affairs
Frank Kennedy	Sr. Licensing Specialist	Regulatory Affairs
Michael K. Leisure	Sr. Engineer - Licensing	Regulatory Affairs
Robert W. Schlingman	Co-op Student	Regulatory Affairs
Vince Capozziello	Supervisor - Chemistry	Chemistry
Al Schumaker	Supv. - Security Support	Nuclear Security
Steve Campbell	SRI	NRC
Jim Lash	Plant Manager	Plant OPS
Keith Mortensen	I&C Engineer	NRC/NRR/HICB
Jim Freels	Manager	Regulatory Affairs
Gary Skeel	Manager	Security

Ted Meyers	Director	Nuc. Sup. Services
Henry Stevens	Manager	NSI - NA
Lonnie Worley	Director	Nuc. Assurance
Preston Hess	Manager	Supply
Clark Price	Manager	Bus. Serv.
Mary Beier	Manager	QA
Lucas Ring	Scheduler	OPS
Joe Rogers	Manager	PE

Exit Meeting Attendees

NAME	TITLE	DEPT./ORGANIZATION
Frank Swanger	DBE MGR	E&S
Marty Beier	MGR Q&A	Nuc. Assurance
J. Rogers	MGR - PE	Plant Engineer
Daniel Jobsky	Sr. Design Eng. Adv.	Proc. Eng.
Kirk Richmond	Cost Eng.	Business Svcs.
Jim Freed	Mgr.	Regulatory Affairs
David Lockwood	Supervisor	Reg. Affairs
Clark Price	Mgr.	Bus. Serv.
Henry Stevens	Mgr.	NSI - Nuc. Assurance
John K. Wood	VP	VP
Jim Lash	Plant Manager	Plant Operations
Steve Coe	Utility Supervisor	PUCO
Gary Viginto	Secretary/Dir. of	Y2K Team PUCO Y2K
Deirdre Spaulding	Elec. Engineer	NRC/NRR/HICB
Keith Mortensen	I&C Engineer	NRC/NRR/HICB
Peter M. Bingham	Auditor - Nuclear	Nuclear Assurance
John G. Waddell	Supervisor - Sev.	Nuclear Security
Bruce W. Cope	Sec. Ep Sepc.	Emer. Prep.
Richard Wilkins	Commercial Attorney	Commercial Attorney
Wayne Glidden	Comp. App. Assur. Coord.	Duquesne Light Beaver Valley
Karen Dunn	Computer Analyst	Computer Engineer
Matthew Selmek	I&C Technician	I&C Maint.
Bob Horland	Senior Eng.	Engineering
Greg Hayes	Supv. Comp. Engineering	Eng. Services
Jerry Iagulli	Client Services Supv.	FEIS

January 11, 1999

Mr. Otto L. Maynard
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, Kansas 66839

SUBJECT: YEAR 2000 READINESS AUDIT REPORT FOR WOLF CREEK NUCLEAR GENERATING STATION (TAC NO. MA1908)

Dear Mr. Maynard:

From November 17, 1998 to November 19, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Wolf Creek Nuclear Generating Station (WCNGS). The purpose of the audit was to (1) assess the effectiveness of the Wolf Creek Nuclear Operating Corporation's (the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding Wolf Creek and conducted interviews with cognizant licensee personnel. Enclosed for your information is the Year 2000 readiness audit report for the Wolf Creek Nuclear Generating Station.

Please contact me at (301) 415-1341 if you have any questions regarding this audit and its findings.

Sincerely,

Original Signed By

Chet Poslusny, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure: Audit Report

cc w/encl: See next page

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION (NRR)
AUDIT REPORT
ON
IMPLEMENTATION OF GENERIC LETTER (GL) 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-482
License No:	NPF-42
Licensee:	Wolf Creek Nuclear Operating Corporation
Facility:	Wolf Creek Nuclear Operating Station
Location:	Burlington, Kansas
Dates:	November 17 - November 19, 1998
Audit Team Members:	Deirdre Spaulding, NRR W. Keith Mortensen, NRR
Approved by:	Jared Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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- Tables and Attachments

Executive Summary

From November 17, 1998 to November 19, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the Wolf Creek Nuclear Operating Station (Wolf Creek). The purpose of the audit was to (1) assess the effectiveness of the Wolf Creek Nuclear Operating Corporation (the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding Wolf Creek and conducted interviews with cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the audit team's assessment and evaluation of the Wolf Creek Y2K readiness program, the following findings were made:

1. The NEI/NUSMG 97-07 guidance is being followed. The Wolf Creek licensee has not identified any systems needed for safe shutdown as having Y2K problems.
2. Wolf Creek is making use of its existing QA and modification programs and procedures to achieve Y2K readiness. Furthermore, Wolf Creek is engaged in extensive information sharing and interfaces with other entities on the Y2K problem.
3. The need for Y2K contingency planning is understood by the Wolf Creek licensee and in keeping with the NEI/NUSMG 98-07 recommendation, one individual has been designated as the single point of contact for contingency planning.
4. Wolf Creek is at the detailed assessment phase except for the items of minimal significance designated as Limited Use Databases and Spreadsheets, which come under the category of Limited Use Hardware/Software. Y2K readiness for Wolf Creek is scheduled for September 15, 1999 and can be achieved based on the effort underway.
5. Executive management support was found to be aggressive at Wolf Creek. Management at Wolf Creek has dedicated the fiscal resources needed for successful completion of the Y2K readiness program.

1.0 Introduction

The objectives of the Wolf Creek Nuclear Operating Station (Wolf Creek) Y2K Program audit were to:

1. Assess the effectiveness of the Wolf Creek Nuclear Operating Corporation (WCNOC) programs for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems.
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999.
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan (http://www.nrc.gov/NRC/Y2K/y2kaudit.html) which was based

in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

- Licensee Response(s) to GL 98-01

- Plant technical specifications and license terms and conditions

- Applicable NRC regulations

- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team reviewed the Wolf Creek Year 2000 Project Manual, revision 0, dated September 14, 1998.

The audit process started with an entrance meeting attended by the Wolf Creek Y2K Sponsor and Y2K Project Manager and other plant personnel, and members of the NRC audit team. Attachment 1 is a list of the attendees. Members of the Wolf Creek Y2K organization described the project organization, the project plan, implementation, and the current status.

Subsequent to the entrance meeting, the audit team reviewed the Wolf Creek Year 2000 Project Manual, associated project documentation, and communicated with the Wolf Creek Year 2000 team personnel on an on-going basis to resolve questions as they arose. The documents reviewed are listed in Attachment 2.

The Wolf Creek Y2K readiness schedule is provided in Table 1.

2.0 Wolf Creek Project Description

2.1 Project Organization

The Wolf Creek Year 2000 Project organization consists of the following: (1) WCNOC project sponsor (2) WCNOC Y2K Core Team, (3) WCNOC Y2K Extended Team, (4) WCNOC Information Services (IS), (5) plant system owners, (6) quality assurance, (7) Licensing, (8) procurement, (9) materials engineering and support, (10) financial controls, (11) corporate communications, and (12) all other WCNOC employees.

The WCNOC Project Sponsor is the WCNOC management individual responsible for overseeing the entire project for Wolf Creek and is actively involved in the oversight of the project through to its completion.

The WCNOC Y2K Core Team operates as a cross functional team responsible for day-to-day coordination of the Y2K project at Wolf Creek. Additionally, the core team acts as the technical and programmatic Y2K resource for Wolf Creek and acts as the primary interface to the owner's Y2K Program Offices and outside organizations. The core team is comprised of three people; the Y2K Project Manager, the IS Hardware/Software Lead, and the Non-IS Hardware/Software Lead, also referred to as the Embedded Systems Lead.

The Wolf Creek Y2K Extended Team is comprised of representatives from a majority of the site organizations that assist in the WCNOC Y2K effort in several ways such as acting as the point of communications between the Y2K Core Team and the site organization for which the extended team member is responsible, and, conducting inventory, testing and Y2K issue resolution within that organization. Each plant system owner is responsible for the resolution of all Y2K related issues.

The Y2K project team includes the executive sponsor, job sponsor, project manager, IS hardware/software lead, non-IS hardware/software lead, legal interface, regulatory interface, corporate communications interface, controller interface, and, performance improvement and assessment interface.

The Wolf Creek project plan designates the following as "high level" tasks for their Y2K project: initial inventory, detailed inventory and assessment phases, remediation phase, and issues resolution phase. Initial inventory pertains to the development of the list of items which have not been found to be immune to the Y2K issue. Detailed inventory and assessment pertains to positive identification of all components and applications that are not Y2K-compliant/acceptably ready.

The following are designated as Program Tasks: initial assessment, detailed assessment, remediation, contingency planning, site-wide communications, interface with outside groups, and program assessments. The Wolf Creek licensee used various methods for the initial identification of items to be assessed for Y2K problems including system owner knowledge and review of plant procedures, vendor supplied documentation, and test data. The items identified were designated as Y2K suspect, Y2K compliant, Y2K ready, Y2K inert, or Y2K non-compliant. At Wolf Creek, the detailed assessment phase involves testing of components and applications to determine their Y2K status and the gathering of information to be used for remediation planning. Additionally, a parallel activity of contingency

planning begain for items that were deemed "mission critical" or "important to the plant," and, are not "inert."

The NRC Audit Team examined the manner in which the Wolf Creek licensee defined "component", "computer", "firmware", and "embedded system", in their Year 2000 Project Plan, and asked for clarification on some of the definitions contained in the Wolf Creek Year 2000 Project Manual. The term "software" is only used in the definition for "Y2K Inert" whereas "system/component " is used in the definitions for "Y2K Compliant," "Y2K Ready," and "Y2K Suspect." Since software could also be designated as compliant, ready, or suspect, the Audit Team wanted to be sure the application of the terms was consistent by all members of the licensee Y2K project team. Through discussion with site personnel, it was apparent that those involved in the inventory clearly understood the inventory process and that items had been properly identified/addressed. Inadvertent omission of the term "software" in the definitions was noted by the licensee and will be incorporated into the revised Wolf Creek Year 2000 Project Manual which is scheduled to be completed by the end of December.

The inventory of the items initially began with a database of 300,000 plant component items. The 300,000 plant component items identified were found in Wolf Creek's configuration status accounting record system (CSARS) database. This list of items was reduced to 40, 000 items and then further reduced to 1208 items. The reduction in the list of items was initially achieved by the system experts reviewing the items and making a knowledge-based decision on whether the item contained any software, or firmware/microprocessors.

2.2.1 Awareness

Site awareness of the Y2K problem is an on-going activity at Wolf Creek. The Y2K core team continues to communicate the issue with all levels of site personnel. The target audience for Y2K awareness consists of management, subject matter experts and system owners, system engineers, software application owners and sponsors, support organizations, and general employees.

Awareness at Wolf Creek has been addressed in a number of ways including organizational awareness briefings and distribution of information, Y2K presentations made to the job review board and the major job review board, and sessions held with individual work groups. Additionally, the Wolf Creek licensee set up a separate e-mail address so that plant personnel could submit Y2K inquiries and information to the core team. Weekly Y2K articles appear in the Wolf Creek "Currents" newsletter. Furthermore, the Wolf Creek licensee placed a flyer in personnel paychecks concerning the Y2K issue.

2.2.2 Initial Assessment

Inventory

The Y2K team at Wolf Creek approached the identification of items in two ways. One was to compile an inventory of all potential computer-based items at the plant from the information located in various data bases at Wolf Creek. The other was to call upon all Wolf Creek employees to identify, (1) any potential or confirmed Y2K items in their areas of responsibility, or (2) any other items of which they may be aware. Exclusions performed on the data were recorded on an "Initial Data Screening Report Form" and serve as a record of how data was pre-screened in preparation for interviews and walk downs. A review of procedures, training material, and other facility documentation for the occurrence of phrases that would indicate the existence of an internal clock or processor was used to identify applications, systems, and components possibly affected by the Y2K problem. Additionally, the compiling of the initial inventory data-base included information obtained through interviews with system owners, plant walk downs, and communication with vendors and suppliers.

The data collected in the initial inventory were entered into the Litton Enterprise Solutions (LES) 2000 Wolf Creek Inventory Database. Information collected during the initial inventory was used to identify applications, systems, and components that would require further investigation. The items in the intial inventory are those which have not been found to be immune to the Y2K issue. The information collected for the database included software or device name, version or model number, description and use, vendor or manufacturer, and Wolf Creek owner or support group. The data also included information regarding the item's importance to safety, plant operability, regulatory commitments, and business considerations. The data collected were used to make initial decisions on categorization, classification and prioritization and were also used to determine budget and resource estimates for the detailed assessment phase.

Categorization

After the inventory was collected, a categorization of the inventoried items was performed. Categorization is the process that groups applications, systems and components, thus allowing management to efficiently assign resources to the classification and prioritization activities. Each item included in the initial inventory was assigned to a category. The categories used at Wolf Creek were similar to those identified in NEI/NUSMG 97-07 as follows:

- IS Infrastructure Hardware/Operating Systems,
- IS Infrastructure Software/Databases,
- Telecommunication equipment,
- Embedded devices,

- Building equipment,
- Limited Use Hardware/Software/Databases, and
- Measuring and test equipment and laboratory equipment.

Classification

Classification is the process by which potential risk factors were evaluated to provide the Y2K team at Wolf Creek with criteria for assigning resources to evaluate and resolve the identified potential Y2K problems. The Y2K team assigned risk categories to facilitate the process of determining the order of performing the detailed assessment of the inventoried items. Two types of risk were defined, (1) date usage risk (DUR), and (2) Safety and Regulatory Risk (SRR). Each risk has three defined category levels.

DUR categories indicate the level of urgency that the date/time function has on the application, system, or component. DUR assignments were made for IS/Infrastructure and for Limited Use Hardware and Software Applications. The three categories of DUR are:

Category I	Date/time stamped data or data for long-term averaging, integrating, trending, scheduling, or reporting.
Category II	Data used for short-term averaging, integrating, trending, scheduling, or reporting.
Category III	Data used for time-independent calculations or operations.

SRR categories indicate the level of impact on plant and personnel safety, continued generating capability, and other facility operating capabilities that the application, system, or component may have if the potential Y2K problem is not resolved and/or mitigated. SRR assignments were made for Plant Embedded and Telecommunication Items and IS Infrastructure and Limited Use Items. The three categories of SRR are:

Category I The application, system, or component:

- Is, of itself, nuclear safety-related, special scope or mission critical equipment,
- Controls a nuclear safety-related application, system, or component,
- May force an immediate or near-immediate plant shutdown,
- Is used for nuclear safety-related activities or calculations,
- Provides automatic control of critical plant functions,
- May require entry into a technical specification limiting condition for operation (LCO) with a limit of 48 hours or less, or
- May degrade the ability to protect the health and safety of the general public.

Category II The application, system, or component:

- May degrade the ability to protect the health and safety of plant personnel,
- May degrade the control of plant habitability systems,
- May require entry into an LCO with a limit of greater than 48 hours,
- Is required by regulations or license commitments, or
- May affect the control or tracking of other critical plant information or operations.

Category III The application, system, or component:

- Controls other plant systems,
- May affect the control or tracking of other plant information or operations,
- Is required by quasi-regulatory (e.g. Institute of Nuclear Power Operations (INPO), American Nuclear Standards Institute (ANSI) requirements, or
- May affect other non-plant applications or systems not covered by Category I or II.

Prioritization

The results of the inventory were prioritized to ensure that resources were effectively allocated to high risk, high priority items. Generally, for IS Infrastructure and Limited Use Items, prioritization followed the following pattern, based on the risk assessment matrix:

PRIORITY	Safety and Regulatory Risk (SRR)	Date Usage Risk (DUR)
Critical	I	I
Critical	I	II
High	II	I
High	II	II
Medium	I	III

Medium	III	I
Low	II	III
Low	III	II
Low	III	III

For plant embedded components and telecommunication items, the highest priority category relating to the assigned SRR was used. Building equipment and measuring, test and lab equipment were directly assigned a priority without using the SRR/DUR categories.

Other factors beyond the risk categories defined above helped to determine prioritization of the inventory results. These other factors included:

- Items known to have Y2K failures or vulnerabilities.
- Complexity of testing/remediation strategy. If a system or component might require a plant/system/component outage, this item received increased priority over non-outage items with higher risk ratings. Items that required engineering design packages for remediation also received a higher priority.
- The number of items requiring testing/remediation. Where a common component was identified and the number of the items requiring attention was large, this received a higher priority.
- Long lead-time items received increased priority. These included items that required testing and remediation by outside agencies whose services might become increasingly difficult to obtain as the year 2000 nears.
- Availability of replacement parts and components.
- Management input. WCNOC management had the ultimate authority relative to the risk assessment and prioritization for Wolf Creek equipment.

Analysis of Initial Assessment

The inventory has been converted to the LES 2000 Wolf Creek Inventory Database, which will be used to track and record information for each inventoried item. This database provides access to the information needed in the detailed assessment phase of the Y2K Project. The licensee's analysis of the data included reports sorted in several ways, including by classification, component, system, vendor, priority and category.

For each item in the inventory, there is a "unique total," and an overall "total." The term unique total indicates that several duplicates of the same component are counted as one item, as opposed to the overall total which the several duplicates of the same componet are individually counted items. For example, the licensee inventoried several air monitoring systems manufactured by Erline Instrument Corporation. These air monitoring systems, which are Y2K compliant, are counted once for the unique total and counted individually to arrive at the overall total. In the instance when Y2K testing would be performed on a suspect component, testing would not need to be done on each component if they are determined to be identical.

The limited use database and spread sheets are still being inventoried. Prior to the arrival of the NRC Y2K audit team, plant personnel conducted a "hard-drive clean-up day" in order to ensure that unnecessary limited use software was removed. An example of a limited use item is a computer program to calculate MOV torque, which is usually loaded on an employee's PC.

Wolf Creek contracted with LES to assist in making any needed vendor contacts to obtain Y2K information. The Wolf Creek licensee has developed guidance to review and assess vendor responses. The Wolf Creek licensee will conduct some testing to confirm the accuracy of vendor information. LES also compiles the Y2K information from Utility Service Alliance (USA) members in a database which the Wolf Creek licensee accesses bi-weekly. Additional Y2K information is also obtained from the EPRI database on embedded systems. The Wolf Creek licensee will first draw their own conclusion concerning the Y2K readiness/compliance of an item and then review the information in the databases to determine if they need to re-evaluate their conclusion or conduct additional testing.

Table 2 provides the resulting completed and categorized Y2K item inventory.

2.2.3 Detailed Assessment

The purpose of the detailed assessment phase at Wolf Creek is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. The Wolf Creek licensee uses written checklists to capture the detailed assessment process and provide for documentation and quality assurance of the work performed. Detailed assessment results are used to make decisions regarding actions required to ensure the continued operation of the software or equipment. The detailed assessment is scheduled for completion on June 24, 1999, with the detailed assessment of mission critical items being completed in early 1999. The following activities occur during the detailed assessment phase:

- Perform visual inspection
- Interview user and/or vendor

- Review vendor documentation including manuals and drawings
- Review vendor parts list
- Review start-up procedure
- Review calibration procedure
- Access vendor Internet Website for Y2K compliant/ready information
- Access third-party Internet Websites for Y2K compliant/ready information
- Review LES 2000 Wolf Creek Inventory Database for identification of other detailed assessment results
- Access other databases such as EPRI for identification of detailed assessment results
- Review vendor or third-party test results
- Perform Y2K testing
- Review computer code including scanning for date references

The Wolf Creek Y2K Team developed a vendor assessment questionnaire and cover letter that have been sent to all vendors of software, firmware or equipment having an embedded microprocessor. The evaluation of the vendor correspondence is being tracked in the LES 2000 Wolf Creek Inventory Database.

The Wolf Creek licensee has scheduled some items for replacement irrespective of the Y2K issue (for example, some items/systems are obsolete). In some instances, the replacement schedule was accelerated in order to meet the needs of the Y2K schedule. The replacement items will be Y2K compliant. The Wolf Creek licensee uses the acronym "NTB," not to be assessed, (see Table 2) for those items that were going to be replaced anyway, irrespective of the Y2K problem

The Wolf Creek licensee is performing an assessment of the Wolf Creek supported applications and devices using the same checklists as noted above for outside vendor items. Wolf Creek's methods for determining Y2K readiness of applications and devices include knowledge-based decisions, scanning of code, and testing. If testing is utilized to determine if a Y2K-suspect application and/or component is Y2K-compliant, it will be performed in accordance with the WCNOC "Year 2000 IS and Embedded Systems Test Instructions," and applicable plant procedures.

Consideration is being given to the plant conditions that are available or needed for a given Y2K assessment test. For example, for certain plant components for which a spare is available, it may be permissible to bench-test the spare. Other components, however may be better tested while resident in their system environment, and may require a component, system, or plant outage to test. When testing components for Y2K compliance, the test will be designed to account for any hardware or software interfaces which that component may have with other components or systems, and the resultant impact that testing may have on those interfaces.

For vendor responses that indicate that an application or device is Y2K-ready or Y2K-compliant, a decision on whether or not to perform assessment testing is required by the Y2K Core Team (with system owner input). This decision will be based on the system risk classification of the item in question, prior experience with the vendor, extent of testing documentation provided by the vendor, and the system owner's knowledge of the item. For components or applications that fail a Y2K assessment test, an analysis will be performed. This analysis will help to determine whether the non-compliant item should be replaced, repaired, retired, of left as-is.

The Performance Improvement Request (PIR) is a form used at Wolf Creek to track the progress of a condition that needs attention. The PIR, after evaluation, may become a work request. Tests of plant embedded components will normally be performed using a work request.

The detailed assessment for nine items which could have had an impact on the upcoming refueling outage has been completed. Two items were initially identified which need to be factored into the outage planning. The first is replacement of the Main Generator Watt Hour Meter. This replacement has been previously planned under a work request. Outage management has noted that this replacement must occur during the refueling outage as a Y2K remediation. The second item is the Programmable Logic Controllers (PLCs) and PC associated with the Fuel Handling Equipment. These devices are stored outside containment after outages and thus would be available for testing/remediation (if necessary) without impact on the outage unless there was a need to do in-situ testing. Additional investigation has indicated that such in-situ testing will not be necessary.

The Wolf Creek licensee uses an information system called MAPPER, for which Y2K remediation is necessary. Several applications are encompassed in MAPPER including the flux mapping console, purchasing, health physics, personnel training schedules, and periodic surveillance tracking. Sixty-two MAPPER assessments have now been completed along with 44 infrastructure hardware items. Plans are now being finalized to remediate the non-compliant/ready MAPPER applications.

Thirty detailed assessments have now been completed in the area of non-plant components/IS infrastructure items. Seventeen Wolf Creek communications items have been identified that are common with Western Resources (one of the owners) equipment. Western Resources has assessed these items and the Wolf Creek licensee has requested their evaluations.

The licensee has determined that there are no microprocessors or software in the equipment necessary for safe shutdown of the plant.

Microprocessors have been found in two items that can trip the plant. These are the turbine vibration monitoring equipment and the anticipated transient without scram (ATWS) mitigating system actuation circuitry (AMSAC). These two items are undergoing detailed assessment at this time.

Table 3, "Critical Embedded Items Reviewed by the Audit Team," provides the list of eleven critical embedded items for which the folders were reviewed by the NRC Audit Team. The NRC Audit Team noted the followingregarding these items:

1. The audit team tracked the progress of the folder for the RM-80 Steam Line Vent Monitor from "Suspect" to "Y2K Ready." The team chose to audit this folder because the content of the Asset/System Detail Report attached to the folder showed the status of the item to be "Suspect" while the folder indicated that the item had been found by the system engineer to be "Y2K Ready." The team found that this apparent discrepancy was due only to the fact that the report was printed one day earlier than the date of the entries into the folder. The result of the NRC Audit Team investigation was the confirmation that in this case there was no discrepancy between the content of the folder and the data in the LES 2000 Wolf Creek Inventory Database.
2. The supplier for the RM-11 process radiation monitor is General Atomic Company. The platform for the system is a DEC PDP11-34 mainframe computer. This model computer came into popular use in the early 1970's. It computes dates using the Julian Calendar. The audit team tracked the progress of this item from "Suspect to "Non-compliant" with the intended approach to remediate the system.
3. The folder for the Model 4190 computer data aquisition system indicated that it is scheduled to be remediated and made Y2K compliant.
4. The Rosemount Model 8712RA12M4 flow transmitter is one of Rosemount's "smart" transmitters. The term "smart" is applied to models that are micro-processor based. A letter from the vendor confirms that this model is Y2K compliant. All transmitters in this model series have date functionality. The licensee judged the transmitter to be Y2K compliant based on information collected from the Rosemount website.
5. See discussion under 4. above..
6. Western Resources, one of the owners of Wolf creek, has investigated the Model JEM II main transformer and confirmed that it is not Y2K compliant. It will be replaced with a Y2K compliant model. Information was gathered from the vendor's web site,
7. The assessment showed that the structure in the PROM results in the Model 4120 Fire Protection Panel experiencing failures on dates not usually associated with the Y2K problem. Thus, this system will be remediated. The final testing of this item after upgrade will include these dates in addition to those dates that are part of the licensee's usual Y2K tests as identified in their program.
8. The Model 4120 Fire Protection PC Terminal provides an interface to the Fire Protection panel. It has been determined that it is Y2K non-compliant and will be remediated. .
9. The existing flux mapping console contains 6 microprocessors, four of which are type 8080A microprocessors on Westinghouse printed circuit cards and two of which are inside separate Hewlett Packard Model 2649A terminals. The existing system will be replaced by a Y2K compliant system.
1. The existing Site Security System controls personnel access throughout the site and was developed around a Digital Equipment Corporation (DEC) PDP11/34 minicomputer. The PDP11/34 will be replaced by a more modern computer under Wolf Creek Change Package 06571, which includes major changes to multiple assets. Operation of the new system is scheduled for September 1, 1999. The Wolf Creek licensee has a contingency plan for controlling site access in the event that readiness of the new system is delayed beyond January 1, 2000.
2. The CEM Digester MDS 2100 has entries in the LES 2000 Wolf Creek Database that the audit team found to be inconsistent with regard to the usual definitions of Y2K compliant and Y2K ready. The entry under "compliance" showed the item to be Y2K compliant. The entry under "Milestone" indicates that the utility still is performing some evaluation. This item was not yet known to be "Y2K Compliant" under the definition found in NEI/NUSMG 97-07. Y2K susceptibility testing is not complete. However, based on discussion with Wolf Creek personnel, it was determined that the system is known to be Y2K ready and can be used as is.

The NRC Audit Team noted that detailed assessments are ongoing for the non-outage plant component group of 472 items. Of these, 370 assessments had been completed as of October 23, 1998, with the remaining assessments on schedule per the Wolf Creek program plan.

2.2.4 Y2K Testing and Validation

The Y2K susceptability test procedure used at Wolf Creek is the result of the combined efforts of the Utilitiy Service Alliance (USA) interaction. The Audit Team witnessed a demonstration of Y2K testing of a desktop PC used by plant personnel, and a demonstration of Y2K testing of the water cleanup/purification control system.

The critical dates used in the PC test were: rollover from 12/30/98 to 1/1/99, which was successful, rollover from 12/30/99 to 1/1/00,

which rolled the date back to 1980 (which is the DOS default date), rollover from 12/30/00 to 1/1/01, which was succesful, rollover from 2/28/00 to 2/29/00 which was successful, and rollover from 2/29/00 to 3/1/00 which was successful.

For the demonstration of Y2K testing of the water cleanup/purification control system, the following was observed: The Intel 486 PC, (which is the man machine interface (MMI)) was connected to the PLC (Allen Bradley PLC5) control logic. The PLCs were determined to be Y2K compliant but the MMI was not. The Intel 486 PC MMI will be upgraded to a Y2K compliant version.

2.2.5 Remediation

As applications and devices are confirmed by the detailed assessment process to be Y2K non-compliant, a business decision will be made to repair or replace the item to (1) attain Y2K compliance or readiness, (2) leave the item as-is, or (3) retire the item. If the decision is made to retire the application or component, no further evaluation action is required other than to close any associated Y2K inventory item and document the decision. The associated work request will track the completion of the retirement of the item. If the decision is made to leave the application or component as-is, the item will be further evaluated to determine if any steps need to be taken to make the item Y2K-ready. Documentation of this evaluation will be submitted with the applicable PIR or work request. If the decision is made to repair or replace the item to make it Y2K-compliant or ready, then the repair or replacement activities will be governed under the applicable plant procedures.

The final segment of the remediation phase is post-modification testing. If a test confirms that Y2K compliance has been attained for a given item, the Y2K-related PIR or work request for that item may be closed. If the item tested proves to be still Y2K non-compliant, the remediation phase becomes iterative and the related modification must be re-visited. Changes to software will be performed within the existing Wolf Creek software quality assurance program.

Wolf Creek has identified the following items as needing remediation due to Y2K problems:

- Nuclear Plant Information System Computer
- Loose Parts Monitoring System
- VOTES Test Equipment
- Radiation Monitor RM-11's
- HP Computer System
- Chemistry Computer System
- CYBORG Computer Application (Human Rescources and Payroll)
- Various MAPPER Applications
- Support Engineering Oil Analysis Program
- Main Transformer Watt Hour Meter
- Simplex Fire Detection Panels
- Training Computer Modules
- Post-Accident Sampling System (PASS)
- Pyrotronics System 3 Fire Protection Panel
- LANCE WIN-DATA Computer Program
- 14 IS Infrastructure Software Items
- Effluent Management System
- Supplier Quality Information System

The following additional items are being remediated for other reasons but also have Y2K problems:

- Flux Mapping System
- Security Computer System

The Post-Accident Sampling System (PASS) is based on a DEC PDP 11/34 minicomputer and a programmable logic controller (PLC). A request to retire this system is presently in the hands of the NRC and awaiting approval. The request calls for the removal of the computer from the process and for a simplified post-accident sampling process, which will be accomplished by taking fewer samples manually. Remediation at Wolf Creek will be required only if the request is denied or the approval is delayed beyond December 31, 1999. In either of these cases, a workaround has been developed which includes providing for post-accident sampling to be done manually through a backup system until the issue is resolved. The backup system, called PASS Suitcase, already exists at Wolf Creek and is approved for use as part of the existing post-accident monitoring plan.

2.2.6. Regulatory Considerations

The Wolf Creek licensee indicated that the objectives of their Year 2000 project include ensuring that site-wide activities are coordinated in a manner to maintain Y2K readiness and regulatory commitments. Wolf Creek makes use of existing programs and policies to ensure that appropriate reviews and evaluations are performed and documented for regulatory compliance including those required in accordance with 10 CFR 50.59 for modifications to plant systems, reportability evaluations per 10 CFR 50.72 and 10 CFR 50.73 and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

Existing programs and procedures used at Wolf Creek to address Y2K readiness include (PIR), work orders, existing modification procedures, and existing configuration procedures. The PIR process has resulted in several suggestions for Y2K review items and suggestions for performing an independent internal audit of the Wolf Creek Y2K program.

2.2.7 Contingency Planning

Wolf Creek uses the Y2K contingency planning guidance described in NEI/NUSMG 98-07. Although no contingency plans have been finalized, some contingency plans are currently being drafted. The Wolf Creek Licensee's approach to contingency planning is to ensure that contingency plans are put in place which ensure that business continuity is maintained through the key Y2K rollover dates. The contingency plans are based on two areas: (1) risk assessment associated with remediation strategy challenges (internal), and (2) external challenges. In keeping with the NEI/NUSMG 98-07 contingency planning guidance, the Wolf Creek licensee has designated a single point of contact for contingency planning.

2.2.8. Y2K Program Management

Per the NEI/NUSMG 97-07 guidance, the Y2K management plan establishes, organizes, manages, and integrates the diversity of activities required to address Y2K readiness. The Wolf Creek licensee makes use of performance indicators to track the progress of the Y2K Project and provide a graphical representation of the actual work completed against established goals.

The Wolf Creek licensee recognized the importance of interfacing with other organizations to address Y2K readiness, and thus, a member of the Wolf Creek Y2K Core Team acts as liaison to the owners Year 2000 Program Offices. Wolf Creek personnel are involved in Y2K problem information sharing with the USA, NEI, NUSMG, EPRI and the Westinghouse Owners Group. A peer assessment of Wolf Creek was conducted by representatives from the Clinton, Ft. Calhoun, and Callaway Nuclear Power Plants (members of USA). Feedback from this assessment will be incorporated in the revised Wolf Creek Year 2000 Project Plan. Each USA member completes its own Y2K evaluation/testing and then uses other members results to examine its own readiness program results.

Wolf Creek Nuclear Operating Station, has three owners, Western Resources, Kansas City Power and Light, and Kansas Electric Power Cooperative. The owner's Y2K coordinators maintain communication with the Wolf Creek Station Y2K program manager.

Senior management support for the Wolf Creek Y2K effort has been strong and effective. The Executive Sponsor for the Y2K project is the VP -Engineering with lines of communication to the Executive Sponsor provided directly from the Y2K Project Manager through the Job Sponsor. Funding for the Y2K project has been provided in the budget, and in the event additional resources are needed to address Y2K readiness, they can be readily provided per the existing approval process.

Management oversight of Y2K activities is maintained by means of periodic reports provided to Wolf Creek Executives and Owners. In addition, the Y2K problem is an agenda item at the weekly Wolf Creek Executive and monthly Owner's Committee meetings, and reviews are performed by the Owner Internal Audit Group whose reports are submitted to the corporate chief executive officer.

2.2.9 Electrical Grid Issues

The Wolf Creek licensee indicated that grid instability as a factor to be included under external risk identification, as part of their Y2K contingency planning effort, which has yet to be developed. The owner, Western Resources Incorporated, will interface with NERC to address grid issues consistent with the overall Y2K grid reliability program for the mid- west.

3.0 Audit Team Observations

1. The NEI/NUSMG 97-07 guidance is being followed. At Wolf Creek, Y2K awareness is an on-going activity and previously conducted awareness activities included all-hands-meetings, newsletters, and a Y2K information flyer included with employee paychecks. The Wolf Creek licensee has not identified any systems needed for safe shutdown as having Y2K problems.
2. Wolf Creek is making use of its existing QA and modification programs and procedures to achieve Y2K readiness. Furthermore,

Wolf Creek is engaged in information sharing and interfaces with other entities including NEI, NUSMG, The Westinghouse Owners Group, the Utility Service Alliance (USA), and the Callaway Nuclear Power Plant. Wolf Creek has participated in peer reviews and will incorporate recommendations from those reviews in the next version of the Wolf Creek Year 2000 Project Plan.

3. The need for Y2K contingency planning is understood by the Wolf Creek licensee and in keeping with the NEI/NUSMG 98-07 recommendation, one individual has been designated as the single point of contact for contingency planning.
4. Wolf Creek is at the detailed assessment phase except for the items of minimal significance designated as Limited Use Databases and Spreadsheets, which come under the category of Limited Use Hardware/Software. Y2K readiness for Wolf Creek is scheduled for September 15, 1999. The licensee will provide a status of remaining Y2K readiness work in their second Generic Letter 98-01 response due July 1, 1999. The audit team believes the readiness date can be achieved based on the efforts underway by the licensee.
5. Executive Management support is found to be aggressive at Wolf Creek. Management at Wolf Creek has dedicated the fiscal resources needed for successful completion of the Y2K readiness program. Wolf Creek management has made it a point to maintain awareness of the Wolf Creek Y2K readiness efforts through weekly meetings and on-going communication with members of Wolf Creek Y2K Team.

Tables and Attachments

Table 1 - Wolf Creek Project Plan Schedule

Activity	Starting Date	Finishing Date
Awareness	1997	August 27, 1999
Initial Assessment	May 1998	November 30, 1998
Detailed Assessment/analysis	July 6, 1998	June 24, 1999
Individual Remediation	October 7, 1997	September 15, 1999
Contingency Planning	November 16 1998	March 16, 1999

Table 2 - Inventory *

		INERT	READY	SUSPECT	NTB ASSESSED	COMPLIANT	NON-COMPLIANT	TOTAL
PLANT COMPONENT ITEMS	Unique Total	271	33	137	49	20	8	518
	Total	567	192	371	51	43	11	**1125**
IS INFRASTRUCTURE ITEMS	UniqueTotal	4	0	287	23	231	118	663
	Total	4	0	794	28	881	632	**2339**
MEASUREMENT, TEST & LAB ITEMS	UniqueTotal	42	28	135	0	15	1	221
	Total	69	38	440	0	62	1	**610**
COMMUNICATION ITEMS	UniqueTotal	0	0	20	6	0	1	56
	Total	0	0	20	6	0	1	**112**
FACILITY ITEMS	UniqueTotal	4	3	47	1	1	0	56
	Total	6	3	97	3	3	0	**112**
LIMITED USE ITEMS	UniqueTotal	0	0	205	0	0	0	205
	Total	0	0	205	0	0	0	**205**

*The licensee makes a distinction between "unique total" and "total." Unique Total refers to a component being counted as one item although there may be multiple identical items whereas total refers to the absolute total of items.

Table 3 - Critical Embedded Items Reviewed by the Audit Team

#	Asset Description/System (Manufacturer)	Compliance	Intended Approach
1	Model RM-80/Steam Line Vent Monitoring (General Atomic Company)	Y2K Ready	Leave as is
2	Model RM-11/ Cont. Process Radiation Monitor (General Atomic Company)	Non- compliant	Remediate
3	Model 4190/Computer Data Acquisition and Trending (Graver Water)	Suspect	Remediate
4	Model 8712RA12M4 Flow Transmitter/Discharge Header (Rosemount)	Compliant	Leave as is
5	Model 8712RA12M4 Flow Transmitter/Discharge of ECG01A, B, & C (Rosemount)	Compliant	Leave as is
6	Model JEMII Main Transformer/WHM/in-out (Scientific Columbus, JEMTEC)	Non-compliant	Remediate
7	Model 4120 Fire Protection Panel (Simplex)	Non-compliant	Remediate
8	Model 4120 Fire Protection PC Terminal (Simplex)	Non-compliant	Remediate
9	Flux Mapping Console (Westinghouse)	Non-compliant	Remediate
10	PDP11/34 Site Security System (Wolf Creek Design Engineering Department)	Non-compliant	Modify
11	Model 924070 CEM Digester MDS 2100 (CEM Corp.)	Compliant	Leave as is

Attachment 1

List of Attendees

ENTRANCE MEETING - November 17, 1998	
Lonie Ashurst	WCNOC
Mary Brinkman	WCNOC
Britt McKinney	WCNOC
Kevin Moles	WCNOC
Bob Kahn	KCP&L
Richard Robinson	WCNOC
Keith Mortensen	USNRC
Deirdre Spaulding	USNRC
Kim Savage	Western Resources
Dean Wilson	Western Resources
Mark Klug	WCNOC
Roy Andrews	WCNOC
Mario De La Cruz	WCNOC
Lee Jones	WCNOC
Gene Lawson	WCNOC
Peter Martin	WCNOC
Tony Harris	WCNOC
Bill Eales	WCNOC
EXIT MEETING - November 19, 1998	

Roy Andrews	WCNOC
Jack Pippin	WCNOC
Cathy Autrey	WCNOC
Rick Muench	WCNOC
Tony Harris	WCNOC
Glen Seier	WCNOC
Clarence Rich	WCNOC
Ed Peterson	WCNOC
Mark Klug	WCNOC
Michael McCrady	WCNOC
Terry Garrett	WCNOC
Richard Flannigan	WCNOC
Cara Codney	Coffey County Republican - Reporter
Keith Harvey	WCNOC
Janet Rinehart	Western Resources
Deirdre Spaulding	USNRC
Mary Brinkman	WCNOC
L. E. Ellershaw	USNRC
Joe Colaccino	USNRC
Gary Boyer	WCNOC
Britt McKinney	WCNOC
David Knox	WCNOC
Krista Klaus	KCTV - Reporter
Bill Lindsay	KCTV - Photographer
Kevin Moles	WCNOC
Wm. R. Laurence	KSNP - Reporter
Ken Hughes	WCNOC
Chris Younie	WCNOC
John Johnson	WCNOC
Bill Eales	WCNOC
David Oelrichs	Callaway
Ed Schmotzer	WCNOC
Dean Wilson	WCNOC
Keith Mortensen	USNRC
Jeannene Ryan	WCNOC
Chris Reekie	WCNOC

Attachment 2

List of Documents Reviewed

Wolf Creek Year 2000 Project Manual , Revision 0, dated September 14, 1998

Portions of Wolf Creek Draft Y2K Testing Plan

Wolf Creek Entrance Meeting Slides Handout, "Year 2000 Readiness Program," dated November 17, 1998

Letter from Audit Services, Kansas City Power and Light, to Rick Muench, Kevin Moles, and Bill Eales, Subject: Review of Year 2000 Project - WCNOC, dated August 18, 1998

NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," dated October 1997

NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," dated August 1998

NRC Generic Letter No. 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," dated May 11, 1998

Wolf Creek Nuclear Operating Corporation, "Year 2000 IS and Embedded Systems Test Instructions," Document AI-15E-002, Rev. 0, non-dated Draft Version

Nuclear Power Plant Year 2000 Peer Assessment Checklist, non-dated Draft Version

December 8, 1998

Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: AUDIT REPORT ON THE YEAR 2000 PROGRAM FOR WATTS BAR NUCLEAR PLANT, UNIT 1, (TAC NO. MA1906)

Dear Mr. Scalice:

The U.S. Nuclear Regulatory Commission (NRC) staff conducted an audit November 16 - 19, 1998, of the Year 2000 (Y2K) program at the Watts Bar Nuclear Plant as a followup to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rule of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-1493 if you have any questions or comments on the enclosed audit report.

Sincerely,

Robert E. Martin, Senior Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure: Y2K Audit

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION (NRR)
AUDIT REPORT
ON
IMPLEMENTATION OF GENERIC LETTER (GL) 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-390
License No:	NPF-90
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant

Location:	Spring City, TN
Dates:	November 16 - 19, 1998
Audit Team Members:	Michael Waterman, NRR Mario Gareri, NRR Norman Merriweather, DRS, Region II
Approved by:	Approved by: Jared Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

- Executive Summary
- Report Details
  - 1.0 Introduction
  - 2.0 Watts Bar Y2k Project Description
    - 2.1 Project Organization
    - 2.2 Project Plan
      - 2.2.1 Awareness
      - 2.2.2 Initial Assessment
      - 2.2.3. Detailed Assessment
      - 2.2.4. Y2K Testing and Validation
      - 2.2.5. Certification and Remediation
      - 2.2.6. Regulatory Considerations
      - 2.2.7. Contingency Planning
      - 2.2.8. Y2K Program Management
      - 2.2.9. Electric Grid Issues
      - 2.2.10. Critical Suppliers
  - 3.0 Audit Team Observations
- Tables and Attachments

Executive Summary

From November 16 through 19, 1998, the U. S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the Year 2000 (Y2K) readiness program at the Watts Bar Nuclear Plant (WBN) in accordance with the audit plan for this activity. The purpose of the audit was to (1) assess the effectiveness of the Tennessee Valley Authority Nuclear (TVAN), the licensee program for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL)

98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the TVAN Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the TVAN Y2K readiness program, the following observations were made:

1. TVAN has a common Y2K project implementation plan for all its nuclear facilities The TVAN Y2K project plan establishes the scope and control of the Y2K Project Plan at the WBN plant. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The TVAN Y2K program is receiving appropriate management support and oversight at the WBN plant. TVAN sponsorship for the Y2K program is aggressive.
3. The licensee began the formal WBN Y2K readiness program in December 1997, and finished the plant inventory and initial assessment phase on March 5, 1998. The detailed assessment phase for systems and components that are mission critical or important to operations is scheduled to be completed by December 31, 1998. The licensee has established a tightly-controlled schedule for completing Y2K readiness of critical applications and systems by May 1, 1999, and all systems will be Y2K ready by June 1, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification or replacement of major critical computer systems, and the licensee has received support via information sharing with EPRI, other licensees, the Southeast Electricity Reliability Council, and the North American Electric Reliability Council.
4. The licensee has started the WBN Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the TVAN Year 2000 Project Plan. The TVAN Contingency Plan is scheduled for completion on March 31, 1999.
5. The licensee is conducting confirmatory testing of mission critical system Y2K compliance at the plant site for those systems and applications not certified by vendors on the licensee's approved supplier's list.
6. The licensee's independent assessment of the TVAN Y2K project plan was in the planning stage at the time of this audit. Recommendations from that assessment will be addressed by the WBN Y2K project team for subsequent revisions of the TVAN Y2K project plan.
7. Materials management is being addressed by the licensee. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future materiel control.

In addition to tracking the Y2K readiness status of each application and system, the licensee also tracks the Y2K readiness status of the affected plant systems (e.g., Main Steam System, High Pressure Injection System, Reactor Protection System), and provides a cross reference to applicable application and system Y2K readiness packages. This provides the licensee with important plant system operability status information.

Report Details

1.0 Introduction

The objectives of the WBN Y2K readiness program audit were to:

1. Assess the effectiveness of the TVAN program for achieving Y2K readiness, including continued safe operation of the WBN plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems,
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and,
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan outline (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

Licensee Response(s) to GL 98-01

Plant technical specifications and license terms and conditions

Applicable NRC regulations

NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team obtained and reviewed the TVAN Y2K Project Plan, Rev. 2.2, dated October 30, 1998. (Document Number 2 listed in Attachment 2)

The audit process started with an entrance meeting attended by the TVAN Year 2000 Project Manager (PM), Y2K project team members, senior and other site personnel, and members of the audit team. Attachment 3 is a list of the attendees. The WBN Y2K Project Coordinator described project organization, the project plan and its implementation, project status, and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the TVAN project plan and its associated procedures, the plan implementation products (documents and data bases), and interacted with the Y2K Project Coordinator, WBN Y2K project team members, and members of the TVAN Y2K project team. The documents reviewed and referenced in this audit are listed in Attachment 2.

2.0 Watts Bar Y2k Project Description

2.1 Project Organization

The TVAN Y2K readiness program at WBN has 14 full-time equivalent persons supporting the WBN part of the TVAN Y2K project. The WBN project coordinator (PC) for the WBN part of the TVAN Y2K project is Mr. D. Olcsvary. The PC reports to the WBN Business and Work Performance Manager (Mr.

N. D. Nelson), who reports to the WBN Site Vice President (Mr. R. Purcell). The Site Vice President reports to the WBN Y2K project sponsor, Mr. J. Bailey, who is the TVAN Vice President of Engineering and Technical Services. Mr. Bailey reports to the Chief Operating Officer of TVA, Mr. O. Zeringue. The PC stated that the sponsoring efforts have been important to the success of the TVAN Y2K program.

The licensee participates with other organizations that are addressing the Y2K problem. The licensee has received support via participation in the EPRI Y2K program and workshops, sharing information with other licensees and NEI/NUSMG, assessments of other licensees, the Southeast Electricity Reliability Council, and the North American Electricity Reliability Council.

2.2 Project Plan

The TVAN Y2K project plan (Item 2 of Documents Reviewed) was developed by the licensee to establish the scope and control of the Y2K program, and is applied uniformly at every TVA nuclear power plant. The TVAN Y2K project plan is based on the guidance provided in NEI/NUSMG 97-07, which was accepted by the NRC in NRC Generic Letter 98-01 as guidance that presents one approach for achieving Y2K readiness. The audit team's review confirmed that the TVAN Y2K project plan is based on the guidance contained in NEI/NUSMG 97-07.

The TVAN Y2K project plan consists of three major phases; Awareness and Initial Assessment, Detailed Assessment, and Y2K Certification. The Awareness and Initial Assessment Phase comprises communications with the TVAN organization concerning the Y2K issue and its importance; inventory of all potentially affected items; categorization of the identified items to assign resources for classifying and prioritizing activities; prioritization of remediation activities; and system assessments to verify interfaces between systems. The Detailed Assessment Phase comprises the elements of source code examinations; assessing vendor and industry group certifications and test results; and conducting testing. The Y2K Certification Phase comprises the elements of vendor evaluations with regard to remediations; contingency planning; and documentation closure and record keeping. The schedule of TVAN Y2K readiness efforts at WBN is provided in Table 1.

2.2.1 Awareness

The TVAN Y2K program, which addresses all TVA nuclear plants, was begun on December 3, 1997. The TVAN Communication Plan, dated December 22, 1997, prescribes actions for briefing TVAN management, educating the general population of TVAN personnel via departmental newsletters, training personnel who are to perform inventory and assessment activities, and coordinating Y2K team communications. Based on communications reviewed by the audit team, the staff concluded that TVAN has an effective Y2K awareness program.

2.2.2 Initial Assessment

The Awareness and Initial Assessment Phase comprises communications with the TVAN organization concerning the Y2K issue and its importance; inventory of all potentially affected items; categorization of the identified items to assign resources for classifying and prioritizing activities; prioritization of remediation activities; and system assessments to verify interfaces between systems.

The initial assessment part of the Awareness and Initial Assessment Phase started on December 3, 1997, and was completed on March 5, 1998. The completed initial assessment resulted in the identification of

an inventory of the software applications and embedded system components at WBN. The inventory of potentially affected applications and embedded plant systems/components was developed by plant personnel familiar with each plant system/functional area. Some software systems were evaluated by the TVA (corporate) Y2K project team, which supports the TVAN Y2K project team.

In the identification of embedded systems, the licensee reviewed the procedures and documentation for the existence of an internal clock or processor, surveyed the vendors for information on their equipment, performed system walk-downs, and reviewed schematics, program listings, and reference manuals on various instrumentation and control systems. The results of the initial assessment of the software applications and embedded items were placed in the TVAN Y2K data base.

The licensee identified 605 potentially affected systems and components at WBN, including 154 software applications, 295 digital components/devices, and 156 spare parts components. Assessment/testing has been completed for 99 of the 137 mission critical software applications, embedded devices, and spare parts identified by the licensee. Assessment/testing has been completed for 172 of the 273 software applications, digital devices and spare components important to operations. Of the 195 items the licensee considers desirable for Y2K assessment/testing, 105 items have been completed. The balance of the systems and components in these categories is undergoing continued detailed assessment/testing.

The inventory includes a prioritization of the identified items. The priorities are based on mission criticality and importance of the functions being performed. The licensee defines as mission critical those systems or components that directly impact nuclear safety, power production, or current licensing bases. The licensee used risk assessment methods to prioritize each inventoried item as either mission critical, important to operations, or desirable for achieving Y2K readiness or compliance. Mission critical items must be verified to be Y2K compliant or ready by the deadline date. Many items important to operations will be verified to be Y2K compliant or ready by the deadline date. Desirable items are discretionary items that may be verified to be Y2K compliant or ready by the deadline date. The licensee's prioritization process encompasses the criteria described in NEI/NUSMG 97-07.

Table 2 lists the prioritization of the inventoried software applications. Table 3 provides a list of mission critical software systems reviewed by the audit team. Table 4 lists the distribution of embedded devices in the three priority classes. Table 5 lists the embedded devices that were reviewed by the audit team.

The licensee completed the inventory identification (analysis of the initial assessment) on April 15, 1998. During the analysis of the initial assessment, the licensee evaluated the failure risk of each item as the basis for assigning the priority; recommended the approach/plan for detailed assessment, testing, and remediation; and estimated the detailed assessment/remediation cost. Unless specifically noted otherwise, the licensee did not formally assess and remediate low priority items. Remediation of these items will be done as time and resources permit.

2.2.3. Detailed Assessment

Detailed assessments consist of source code examinations, review of vendor certifications and tests, testing systems in-house, and review of industry group certifications and tests. Vendor evaluations encompass evaluation of available manufacturer/developer information (such as contracts, correspondence, vendor manuals, Internet listings, and vendor owners groups), communications with

vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Test evaluations involve the development of test procedures and acceptance criteria to determine whether a Y2K problem exists.

The licensee is scheduled to complete its detailed assessment of mission critical and important to operations items by December 31, 1998. The detailed assessments performed to date follow the project implementation plan. As with the Awareness and Initial Assessment Phase, the audit team found the licensee's documentation sufficient for justifying the results of the detailed assessments, which established Y2K compliance/non-compliance and readiness of systems.

2.2.4. Y2K Testing and Validation

Y2K problem susceptibility testing is based on the licensee's determination of the importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information. Mission critical and important to operations systems and embedded devices provided by suppliers not on the licensee's approved

supplier list are tested by the licensee or through a Y2K testing contract regardless of vendor certification. The licensee's Y2K project team developed the onsite testing procedures to ensure consistency in the implementation of Y2K susceptibility testing.

When plant equipment is also present in the plant simulator, the simulator equipment is used as the base test equipment, and the plant equipment is then certified Y2K ready by its equivalence to the simulator equipment. The licensee does not use a formal procedure or process for establishing equivalence between the simulator equipment and/or redundant channels of plant equipment. Equipment and firmware technical manuals and data under configuration control is the most frequently used source of data for determining equivalence between redundant channels of equipment. The licensee has inspected some channels of equipment at the circuit board level; however, this is not the most common practice. The audit team found the licensee's use of available technical manuals and data to be acceptable.

The auditors found only minor documentation discrepancies in some test packages. For example, in WB-430, "Wind Speed Direction Recorder," the licensee signed off on the test results form prior to receiving final approval on the test plan. In another case, WB-433, "WATCHDOG," test procedures C.14, "Timer Test," and C.18, "Display Data Test," were not included in the Y2K package, but the test report summary form, "Combined Component Test Report Form," was marked as having passed these two tests. There were several other discrepancies, but all are isolated events and do not indicate a trend in Y2K certification practices or failure to properly identify Y2K problem susceptibility.

2.2.5. Certification and Remediation

Certification is the completion and documentation of Y2K readiness activities for individual systems and components. This includes documentation of validated system modifications and development of required contingency plans.

Remediation is the process of retiring, replacing or modifying software or embedded software devices that are to be retained in service, but have been determined to be affected by the Y2K problem. The program implementation plan provided Y2K compliance criteria for replacement or modification. After remediation is completed, validation testing is required. The licensee is performing the required Y2K

remediation validation testing using the test procedures and test plans developed by the Y2K project. The resulting certifications are acceptable.

2.2.6. Regulatory Considerations

The TVAN Y2K project plan and associated documents include references to existing plant procedures that have guidance on regulatory considerations, such as applicability of 10 CFR 50.59 for plant modification reviews, reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.7. Contingency Planning

The licensee has begun contingency planning using a framework similar to that described in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The contingency plan for WBN mission critical systems and components is scheduled for completion on March 31, 1999. The proposed contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07. The licensee's schedule for completion of the project contingency plans is realistic.

Communications within the TVA grid are on TVA-owned T1, T3, and microwave systems. The primary communication path between plants is a fiber optic T3 network, with the T1 system as a backup. The fiber optic lines are run on the transmission towers, which are owned by TVA. These networks are undergoing Y2K readiness evaluation, and are projected to be ready before the end of 1998. The licensee may communicate with each power producer using any of the above systems, thereby providing diversity in the communications capabilities. The licensee is also planning contingency actions for the unlikely event that all communications within the TVA grid are disrupted by Y2K failures.

2.2.8. Y2K Program Management

The licensee's Y2K program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a format that defines the progress of each Y2K system being evaluated. There have been no schedule slippages in the WBN Y2K program.

In addition to tracking the Y2K readiness status of each application and system, the licensee also tracks the Y2K readiness status of the affected plant systems (e.g., Main Steam System, High Pressure Injection System, Reactor Protection System), and provides a cross reference to applicable application and system Y2K readiness packages. This provides the licensee with important plant system operability status information.

2.2.9. Electric Grid Issues

The audit team discussed electric grid issues with the licensee. WBN provides power to the TVA grid interconnection, which is part of the Southeastern Electric Reliability Council (SERC), one region in the North American Electric Reliability Council (NERC). TVA has initiated activities to address grid reliability with respect to the Y2K problem. The net system load of the TVA system is approximately 27,000 MW, of which approximately 5,500 MW are produced by nuclear power plants. Over the past five years, the TVA system load has been less than 16,000 MW during the New Years Eve period. TVA centrally coordinates the operation of these power producers by monitoring the operating status of each power producer on the grid.

The TVA contingency plan for grid reliability and stability is based on the impact of changes in power production and the probability of changes in power production or demand. The contingency plans are intended to be consistent between power producers in the region to ensure the power producers will not adversely impact the grid. The contingency plans consider probable and credible worst-case scenarios for external as well as internal events. To ensure sufficient electrical energy resources are available, the TVA power producers are coordinating their Y2K planning efforts to determine the optimum loads to carry during the period of the Y2K changeover.

TVA developed a contingency plan for black starts. This procedure was issued on November 6, 1998. The black start procedure provides detailed instructions for starting each black start power source, connecting the load to the grid, and sequencing each power producer onto the grid as the grid stabilizes. TVA is conducting drills with each power producer to ensure the producers can operate independent of centralized control should communications become disrupted by the Y2K changeover. TVA will verify every black start unit is Y2K ready to ensure black start capabilities are available.

To ensure the grid is Y2K ready, TVA has inventoried each transmission line end-to-end to identify all equipment that could be potentially affected by Y2K events. TVA has assigned device leaders to each type of device associated with the major stations and lines in the TVA grid. In the component reviews, the device leaders have reviewed the Y2K readiness of each mission critical component.

The TVA transmission system has 40,000 relays, of which 900 relays may be Y2K sensitive. Of these 900 relays, 60 variations have been tested and found compliant or ready. Additionally, 7 families of relays have been tested. The energy management system (EMS), protective relays, PLCs in capacitor banks, and power line carriers are mission critical items. Hardware Y2K compliance appears to be acceptable, but some software applications are still under TVA review for Y2K readiness. TVA will complete Y2K readiness of its facilities by June 1999, except the EMS, which will be ready in midsummer 1999.

TVA is coordinating with NERC and SERC to ensure grid stability during the Y2K period. The TVA draft contingency plan will be submitted to NERC by December 31, 1998. These plans will be integrated into the NERC contingency plan. NERC will conduct its own drills to test telecommunications capabilities. The first drill involving TVA will be conducted in April, 1999. TVA will also conduct drills of its readiness during 1999.

2.2.10. Critical Suppliers

TVA has prepared a project plan for controlling critical supplies. TVA evaluated its dependency on business partners, customers, and infrastructure suppliers. These three groups were collectively identified as business partners. TVA is soliciting information from these business partners to assess their Y2K readiness. Each business partner was assigned to one of three classification groups: mission critical, high priority, or low priority.

Business partners classified as mission critical were further prioritized based on their potential to disrupt TVA operations either financially or in terms of customer service. The completed assessments are retained in records management for future reference.

Mission critical TVA business partners who are not addressing Y2K readiness will be included in a business impact analyses and contingency planning. These analyses will be provided to the Fuel Supply,

Procurement, and Customer Group to aid in developing plans to mitigate risks to TVA. This information will also be provided to the TVA Office of General Counsel for use in resolving contract issues and to support litigation activities. Additionally, TVA is identifying alternate critical suppliers as part of its contingency planning.

3.0 Audit Team Observations

The audit team reviewed in detail 19 (see Table 3) of the 84 (see Table 2) mission critical and important to operations software applications. Of the 134 mission critical digital systems and digital components identified by the licensee (see Table 4), the audit team reviewed 31 (see Table 5). The licensee's documentation was sufficient for justifying the results of the assessments of Y2K compliance/non-compliance.

The following observations were made by the team auditing the TVAN Y2K readiness program, as it was applied at WBN:

1. TVAN has a common Y2K project implementation plan for all its nuclear facilities The TVAN Y2K project plan establishes the scope and control of the Y2K Project Plan at the WBN plant. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The TVAN Y2K program is receiving appropriate management support and oversight at the WBN plant. TVAN sponsorship for the Y2K program is aggressive.
3. The licensee began the formal WBN Y2K readiness program in December 1997, and finished the plant inventory and initial assessment phase on March 5, 1998. The detailed assessment phase for systems and components that are mission critical or important to operations is scheduled to be completed by December 31, 1998. The licensee has established a tightly-controlled schedule for completing Y2K readiness of critical applications and systems by May 1, 1999, and all systems will be Y2K ready by June 1, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification or replacement of major critical computer systems, and the licensee has received support via information sharing with EPRI, other licensees, the Southeast Electricity Reliability Council, and the North American Electric Reliability Council.
4. The licensee has started the WBN Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the TVAN Year 2000 Project Plan. The TVAN Contingency Plan is scheduled for completion on March 31, 1999.
5. The licensee is conducting confirmatory testing of mission critical system Y2K compliance at the plant site for those systems and applications not certified by vendors on the licensee's approved supplier's list.
6. The licensee's independent assessment of the TVAN Y2K project plan was in the planning stage at the time of this audit. Recommendations from that assessment will be addressed by the WBN Y2K project team for subsequent revisions of the TVAN Y2K project plan.
7. Materials management is being addressed by the licensee. The licensee recognizes that the Y2K

checks and balances now in place should be proceduralized for future materiel control. Mission critical suppliers have been identified, and the licensee is taking proactive steps to ensure that acceptable inventories of critical supplies will be available.

8. In addition to tracking the Y2K readiness status of each application and system, the licensee also tracks the Y2K readiness status of the affected plant systems (e.g., Main Steam System, High Pressure Injection System, Reactor Protection System), and provides a cross reference to applicable application and system Y2K readiness packages. This provides the licensee with important plant system operability status information.

Tables and Attachments

Table 1 -TVAN Y2K Project Implementation Schedule		
Activity	**Starting Date**	**Finishing Date**
Awareness and Initial Assessment	12/3/97	4/15/98
Detailed Assessment	5/1/98	2/24/99*
Y2K Certification	8/21/98	6/1/99
* Detailed assessment of mission critical and important to operations times to be completed by 12/31/98.		

Table 2 -WBN Software Applications Inventory				
	Priority			
System/Group	**Mission Critical**	**Important to Operations**	**Desirable**	**Total**
Computer Engineering Group	0	2	3	5
Corporate Information Services	0	1	1	2
Engineering Systems	0	9	3	12
Environmental Group	2	4	0	6
Measuring &Test Equipment	0	1	1	2
Maintenance Group	0	1	4	5
Operations	1	10	5	16
Rad/Chem	0	46	10	56
Scheduling	0	3	0	3
Security	0	4	1	5
Tool Room	0	0	3	3
Training/Simulator	0	0	39	39
Total	3	81	70	154

Table 3 - WBN Software Applications Reviewed by the Audit Team		
Seq No.	Group	Application
WB-047	RadChem	Radman
WB-065	RadChem	VSDS Visual Survey Data System
WB-080	Ops	ININ (Incore Program)
WB-081	Ops	INCORE3D
WB-084	Ops	AXIMBAL
WB-088	Ops	BOARDCAL
WB-089	Ops	REACTINW
WB-090	Ops	REACTW
WB-096	Engg	HELIOS Version 1.1
WB-154	Training	System
WB-175	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-176	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-246	Security	CCTV & Security System C-CURE System 1 Plus
WB-249	Security	CCTV & Security System C-CURE System 1 Plus
WB-250	Security	CCTV & Security System Allegiant Main CPU Interface Software for the Burle Video Switcher TC8759
WB-267	RadChem	SKINISO
WB-268	RadChem	SKINNG
WB-432	Environ.	MET (EDS System)
WB-433	Environ.	WATCHDOG

Table 4 - WBN Digital Systems and Components Inventory				
	Priority			
System/Group	**Mission Critical**	**Important to Operations**	**Desirable**	**Total**
Engineering Systems	122	141	109	372
Environmental Group	9	2	4	15
Operations	0	1	1	2
Rad/Chem	0	18	9	27
Telecommunications	3	1	1	5
Training/Simulator	0	29	1	30
Total	134	192	125	451

Table 5 - WBN Digital Systems and Components Reviewed by the Audit Team

Seq No.	Group	Application
WB-100	Engg	Neutron Monitoring System Shutdown Monitor
WB-103	Engg	Neutron Monitoring System Source Range Drawer
WB-105	Engg	Neutron Monitoring System Intermediate Range Drawer
WB-106	Engg	Neutron Monitoring System Optical Isolator
WB-109	Engg	Neutron Monitoring System Wide Range Drawer
WB-167	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-171	Engg	Radiation Monitoring System Control & Indicating Assembly
WB-209	Engg	Turbine Bldg Cranes & Miscellaneous Systems and Containment & Auxiliary Bldg Cranes & Miscellaneous Systems Programmable Controller
WB-224	Engg	Main Feedwater/Aux Feedwater AECL Anticipated Transient without SCRAM Mitigating System Actuation Circuit
WB-225	Engg	Main Feedwater/Aux Feedwater AECL Anticipated Transient without SCRAM Mitigating System Actuation Circuit
WB-229	Security	CCTV & Security System BBWireStar Repeater
WB-230	Security	CCTV & Security System Local Intelligence Unit (LIU) board
WB-233	Security	CCTV & Security System BBQ boards
WB-245	Security	VAX Computer VMS V5 5-2H4
WB-284	Fire Ops	Fire Detection System Fire Detection Monitoring Panel
WB-406	Engg	CVCS Recorder
WB-407	Engg	CVCS Recorder
WB-410	Engg	RCS Plasma Display Keypad
WB-411	Engg	RCS ICCM Plasma Display
WB-424	Environ.	Onan 30 KW Motor/Generator
WB-430	Environ.	Wind Speed Direction Recorder
WB-439	Fire Ops	Table 5 - Embedded Systems Reviewed by the Audit Team Fire Detection System Fire Detection
WB-440	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-457	Engg	RCS ICCM
WB-458	Engg	RPS EAGLE 21
WB-461	Engg	RPS EAGLE 21
WB-471	Fire Ops	Fire Detection System Fire Detection
WB-472	Fire Ops	Fire Detection System Fire Detection
WB-517	Security	CCTV & Security System Repeater
WB-518	Security	CCTV & Security System Repeater
WB-521	Security	CCTV & Security System Repeater

Attachment 1

Watts Bar Y2K Audit Plan Outline

A. Project organization
B. Project Manager -
C. Project Sponsor -
1. Participation in Owners Group, Group activities related to the Y2K effort, (EPRI, NEI). Peer review efforts.
2. Corporate activities
3. Schedule of activities for Y2K readiness

Activity	Starting Date	Finishing Date
Communication/ Awareness		
Project Plan		
Inventory		
Detailed analysis/testing		
Remediation		
Validation/testing		
Contingency Planning		

4. Inventory
   (Review the Information Database.)
   Classification:
5. Analysis -
   Number of items identified as Y2K compliant. Review how this was determined - Vendor data; any additional testing.
   Number of items not Y2K compliant -
   Accept As Is: (Review how this was determined. ___ require validation testing. Check vendor data, Owners Group data, any testing by vendor?)
   a) Vendor evaluation - validation testing based on criticality of item, prior experience with vendor, extent of documentation, or plant knowledge of the item
   b) Plant owned or supported software (including tools) evaluation - knowledge based decisions, scanning, testing. When testing proposed, need test specifications and procedures.
   c) Interface evaluation - Part of corporate plan (?) Grid, substation, communication,
   d) Embedded components evaluation- knowledge-based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. (Review the documents when this is the case.)
6. Remediation - Use of existing software procedures (?). Verify long-term commitments for maintaining Y2K readiness.
7. Y2K Testing and Validation
   - Assessment testing - Per Computer problem/change reports (PCRs) and associated V&V plans and test procedures.
   - Testing subsequent to remediation - unit testing; integration testing; system testing.
8. Regulatory Considerations - 10 CFR 50.59 reviews; reportability evaluations per 10 CFR 50.72, 50.73 and part 21; operability determinations.

9. Contingency Planning - NEI/NUSMG 98-07
   - Internal Risks
   - External Risks
   - Remediation Risks (Vendor support, resource limitations, etc.)
10. Y2K Management Plan-
   - Tracking against milestones of the project. Management awareness. Status reporting
   - External resources
   - Use of existing procedures for software QA, configuration management, V&V., Documentation
   - Audits (any audits done/reports issued).

Attachment 2

Documents Reviewed

1. TVAN Y2K Project Team (Roster of Participants)
2. "TVAN Year 2000 Project Plan," Rev. 2.2, October 30, 1998
3. WBN Y2K Organization
4. "Watts Bar Year 2000 Project Status," dated November 14, 1998
5. Device & Application Inventory
6. WBN Y2K Audit Entrance Meeting Slide Handouts
7. "TVA IDNX Backbone Network," Drawing dated August 10, 1998

Attachment 3

Entrance Meeting - Attendees

November 16, 1998

Bob Alsup	TVA Site Quality
Sheila Baker	Transmission and Power Systems
Ron Brow	TVAN Licensing
Vincent Burzese	Transmission and Power Systems
Jerry Bushnell	WBN Licensing
Johnfred Carlton	Transmission and Power Systems
Jack Cox	TVA
Mario Gareri	NRC
Frank Koontz	TVA Site Engineering
W. Lagergren	WBN Plant Manager
Barbara McKenna	TVAN Y2K Project Coordinator
Norman Merriweather	NRC
Dave Nelson	WBN Business & Work Performance Manager
David Nye	TVAN Y2K Project Manager
Duane Olcsvary	WBN Y2K Project Coordinator
Paul Pace	TVAN Licensing

Dan Rich	NRC/RI
John Roden	TVA Operations Training
Jim Staub	TVA Site Engineering
Frank Tanner	TVA Y2K Device Test Coordinator
Kim VanDoorn	NRC/SRI
Mike Waterman	NRC
J. West	WBN Assistant Plant Manager
Franklin Wheeler	TVA Telecommunications

December 18, 1998

Mr. Garrett D. Edwards
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 - YEAR 2000 (Y2K) PROGRAM (TAC NOS. MA1851 AND MA1852)

Dear Mr. Edwards:

From November 3 through November 5, 1998, members of the NRC staff conducted an audit of the PECO Energy Company's Year 2000 (Y2K) Program for the Limerick Generating Station, Units 1 and 2. The results of the audit are delineated in the enclosure. We appreciate your cooperation and the input from your staff in assisting the NRC staff in completing its evaluation of your Y2K program readiness.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-1483 if you have any questions or comments on the enclosed audit report.

Sincerely,

Bartholomew C. Buckley

Bartholomew C. Buckley, Senior
Project Manager
Project Directorate I-2
Division of Reactor Projects - l/ll
Office of Nuclear Reactor
Regulation

Docket Nos. 50-352 and 50-353

Enclosure: Audit Results
cc w/encl: See next page

- Executive Summary
- Report Details
  - 1.0 Introduction
  - 2.0 Discussion
    - 2.1 Project Organization
    - 2.2 Y2K Participation with Other Organizations
    - 2.3 Project Plan
    - 2.4 Awareness
    - 2.5 Initial Assessment
      - 2.5.1 Inventory
      - 2.5.2 Categorization/Classification
      - 2.5.3 Prioritization
      - 2.5.4 Analysis of Initial Assessment
  - 2.6 Detailed Assessment
  - 2.7 Y2K Testing and Validation
  - 2.8 Remediation or Replacement

- 2.9 Regulatory Considerations
- 2.10 Contingency Planning
- 2.11 Y2K Program Management
- 2.12 Electric Grid Issues:
- 3.0 Observations

- Attachments and Tables

Enclosure

Executive Summary

From November 3 through November 5, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the PECO Nuclear Company (PECON), Limerick Generating Station (LGS), Units 1 and 2, in accordance with the audit plan for this activity. PECON is the nuclear portion of PECO Energy Company (PECO), which owns the Peach Bottom Generating Station, Units 2 & 3, and LGS Units 1 & 2. PECON's Y2K program applies to both stations. The audit was performed on PECON's Y2K program, and where appropriate, the audit team identified those Y2K observations specific to LGS.

The purposes of the audit were to (1) assess the effectiveness of PECON's programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems, (2) evaluate Y2K program implementation to ensure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding its Year 2000 Project Plan and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the U.S. Nuclear Regulatory Commission (NRC) audit team's assessment and evaluation of the LGS Y2K readiness program, the following observations were made:

1. The PECON Y2K readiness program is comprehensive and is based on the nuclear power industry's Y2K problem guidance contained in Nuclear Energy Institute (NEI)/ Nuclear Utilities Software Management Group (NUSMG) 97-07, " Nuclear Utility Year 2000 Readiness." Internal and external audits and interactions with other utilities and organizations should further enhance the PECON Y2K program.
2. The PECON Y2K readiness program is receiving appropriate management support and oversight and project schedules are being pursued aggressively.
3. The licensee identified 54 systems needing remediation at the LGS. All of these systems will be Y2K compliant or ready by June 30, 1999, with the exception of the following four systems, which are presently scheduled to be completed after July 1, 1999: (1) the plant security computer, (2) hand geometry units, (3) personnel dosimetry system (RADOS), and (4) the radiation and meteorology monitoring system (RMMS). The audit team determined that this would not impact achieving Y2K readiness of LGS to operate on January 1, 2000, as sufficient time is available for remediation of these systems.
4. Y2K rollover effects on LGS's safety-related instrumentation control equipment is very minimal because LGS uses almost entirely analog technology for activation and control of safety functions. The two computer-based software based safety-related systems at LGS are Y2K ready.
5. The audit team noted a discrepancy in PECON's Y2K guidelines with respect to use of the Y2K initial assessment for the embedded equipment. The licensee revised its guidelines to require use of the template for all future equipment initial assessments.
6. The audit team confirmed that PECON uses the existing modification procedures including those for software modifications in the Y2K remediation efforts.

Report Details

1.0 Introduction

PECON's Y2K program applies to the Peach Bottom and Limerick stations. The audit was performed on PECON's Y2K program, and where appropriate, the audit team identified those Y2K issues specific to LGS.

The objectives of this audit were:

1. To assess the effectiveness of the licensee's (PECON) program for achieving Y2K readiness and in addressing compliance with the

terms and conditions of the LGS license and NRC regulations and continued safe operation with respect to the Y2K problem.

2. To evaluate program implementation activities to assure that the licensee is on schedule to achieve Y2K readiness in accordance with GL 98-01 guidelines.
3. To assess licensee contingency planning for addressing risks associated with potential events resulting from Y2K problems.

The audit review used the guidance and requirements contained in the following documents:

- Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL 98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team obtained and reviewed the PECON 2000 Program Plan, Administrative Guidelines, and other PECON Y2K readiness documents.

The audit process started with an entrance meeting attended by corporate managers, the PECON Year 2000 Readiness Project Manager, and various Y2K readiness organization group leaders and some of their staff. Attachment 2 is a list of the attendees. The corporate managers, the PECON Y2K solution manager, and the various Y2K ready organization leaders (managers) briefed the audit team on the project organization, the project plan and its implementation, and the current project status and future activities.

Subsequent to the entrance meeting, the audit team reviewed documents listed in Attachment 1, and the plan implementation products (documents and data bases) and interacted with the various organization leaders and their staffs to obtain clarification and amplification on various issues arising during the audit.

2.0 Discussion

2.1 Project Organization

Jack Gibson is the year 2000 solution manager (SM) for the PECON Y2K Project. The project has 30 full-time persons, including contractors. In general, the contractors are PECON retirees with extensive knowledge in the systems for which they have responsibility. The SM leads the project and reports to J. Hogan, a program sponsor, who is vice present of nuclear support and chairman of the Y2K steering committee. The program manager reports to the SM, and has responsibility for the schedule, budget, and resources. Attachment 3 is an organization chart of the PECON 2000 Program Team, and Attachment 4 describes the responsibilities and interface of each Y2K organizational group.

2.2 Y2K Participation with Other Organizations

PECON has actively participated with NEI, NUSMG, Electric Power Research Institute, and the Boiling Water Reactor Owners Group in developing industry guidance for resolving Y2K issues and in Y2K related workshops. In addition, it shared its Y2K experiences and knowledge with other licensees (1) to assist in developing and improving their Y2K programs, and (2) to improve PECON's Y2K program with lessons learned from those licensees. The licensees with which PECON shared information include Brunswick, Harris, Robinson, San Onofre, and WNP2 plant licensees. Presently, PECON is leading an effort to share information with other licensees on contingency planning.

2.3 Project Plan

PECON formally initiated the LGS Y2K project in January 1997. By November 1997, PECON had (1) issued the PECON Year 2000 Program Plan, and (2) completed forming the Y2K steering committee and staffing the Y2K program team. The program plan identified the key milestones of the project. On October 28, 1998, based on a recommendation from an external audit, PECON issued the Project Administrative Guideline specific for PECON to address the key objectives of NEI/NUSMG 97-07 Nuclear Utility Year 2000 Readiness. " The implementation plan of the PECON Year 2000 Project Administrative Guideline includes the following phases as recommended in NEI/NUSMG 97-07: awareness, inventory, categorization/classification, prioritization, initial assessment, detailed assessment, remediation, Y2K testing and validation, contingency planning, quality assurance, regulatory considerations, and documentation. The audit team's review confirmed that the PECON Year 2000 Project Administrative Guideline is based on the guidance contained in NEI/NUSMG 97-07.

2.4 Awareness

The formal Y2K awareness phase of the Y2K program was begun in January 1998. On November 4, 1998, PECON published the "Y2K

Communication Plan," which identified target audiences, key messages, and Y2K awareness action items. Prior to issuing this document, the Y2K problem was brought to the attention of all PECON employees via published newsletters. PECON published newsletters include PERSPECTIVES, DUPONT TALES, and INSIDE NUCLEAR. Additionally, PECON organized brown bag meetings and workshops to inform plant personnel of Y2K issues. The PECON awareness program will continue until April 2000.

2.5 Initial Assessment

PECON commenced the initial assessment in January 1998. By July 31, 1998, PECON completed the initial assessment including an inventory, categorization, classification, prioritization, and analysis of systems potentially impacted by the Y2K problem.

2.5.1 Inventory

The inventory identifies all software items (information technology systems) and embedded systems in the PECON program potentially affected by the Y2K problem. The inventory of all information technology (IT) systems identified 356 software items of which 133 items were for LGS. From the components record list (CRL), which contained more than 65,000 components, the licensee identified 1066 embedded components for review.

2.5.2 Categorization/Classification

Categorization of the inventoried items is the process that groups devices, software, and systems by type of equipment. This allows management to efficiently assign resources to the classification and prioritization activities based on team member expertise. Typical Categories are: mainframe applications, system software (operating systems, databases, utilities, etc.), client server applications, workstations, software interfaces, telecommunication equipment, and plant embedded devices and systems. Within the system categories, the subject matter experts classified each system to determine whether the system required a detailed Y2K assessment. Each inventoried item is classified under one of the following classes:

Class1: Safety-related, Important-to-safety

Class 2: Required by regulation, license, operational needs and/or for personnel safety

Class 3: Continuity of business

Class 4: Non-essential

PECON required a detailed assessment of systems classified under Class 1, 2 or 3 or if the system interfaced with another system in those classes.

2.5.3 Prioritization

Each of the classified items was prioritized for purposes of assigning an order to the performance of the detailed assessment. PECON stated that the criteria used to set the priorities are as follows:

Priority 1, STRATEGIC

- Has safety implications to employees/customers/general public,
- Required by regulatory agencies for operation,
- Severe impact to PECON operation,
- Lost productivity to most the employees.

Note: All embedded components in plant systems have this priority.

Priority 2, HIGH

- Mandated by regulatory agencies but can be lost for short periods of time,
- Operation continues but with difficulty,
- Lost productivity to a majority of employees,
- Asset is used solely as a backup to an asset of severe importance.

Priority 3, MEDIUM

- Mandated by regulatory agencies but have compensatory measures,
- Operation continues but is cumbersome,
- Lost productivity to some number of employees,
- Asset is used solely as a backup to an asset of high importance.

Priority 4, LOW

- Minimal or no impact to business unit operation,
- Lost productivity to a minimal number of employees,
- Asset is used solely as a backup to an asset of medium importance.

2.5.4 Analysis of Initial Assessment

Analysis of the initial assessment is the final step in the initial assessment phase. PECON used the results of this analysis to determine the scope, schedule, and estimated resources required for the detailed assessment. During the analysis, items are determined to be "Use-As-ls" or designated as needing further detailed assessment. Items are designated "Use-As-ls" if (1) the items are determined not to be mission critical, and (2) there is no business reason for performing the detailed assessment.

PECON performed an analysis of the initial assessment on 356 software items identified during the inventory phase. Of those 356 software items, 133 items are for LGS. Of those 133 items, the subject matter experts determined that 76 items need a detailed assessment. In addition, 1066 embedded components were identified during the inventory phase consisting of 156 different types of components (devices). PECON took a conservative approach and required a detailed assessment of all 156 different types of embedded components. The results of the initial assessment are placed in the Y2K assessment checklist.

2.6 Detailed Assessment

In the detailed assessment phase, PECON obtained information on each inventory item to determine its expected performance when subjected to the rollover dates identified in NEI/NUSMG 97-07. PECON used the assessment results to make a decision regarding the action required to ensure the continued operation of the systems being assessed. During this phase, PECON evaluated software and interfaces to determine whether the item is Y2K ready. For embedded systems, PECON also evaluated hardware, firmware, and operating systems, if necessary for Y2K readiness.

PECON is scheduled to complete its detailed assessment by November 30, 1998. To date, PECON has finished the detailed assessment on 60 of 76 software items and 145 of 156 different types of embedded components identified during the initial assessment. The audit team reviewed 16 completed folders of software items as listed in Table 1 (Attachment 7) and 17 completed folders of the embedded system items as listed in Table 2 (Attachment 8).

Based on the review of the completed software and embedded system items identified in detailed assessment folders, the audit team found that the detailed assessments performed to date have followed the project implementation plan. However, in reviewing the packages of embedded system components whose initial assessments have been completed, the audit team found that PECON did not use the initial assessment template provided in the Guideline for Classification and Characterization of System Inventory. For IT items, the audit team found that PECON did use the initial assessment template provided in the project guideline. The audit team discussed this discrepancy with the PECON staff and determined that PECON had obtained the data required by the Guideline for Classification and Characterization of Systems for the embedded systems in a different format. In addition, the audit team found that the template was included in the PECON 2000 project document after PECON completed the initial assessment of embedded system components. In response this to this finding, PECON revised its guidelines so that any new embedded item identified will use the initial assessment template.

2.7 Y2K Testing and Validation

Y2K susceptibility testing is performed during the detailed assessments and requires the development of test procedures. Y2K validation testing will also be performed subsequent to remediation to confirm that the modifications have eliminated the Y2K problem and no unintended functions are introduced. The PECON Y2K susceptibility tests consist of unit

testing, integration testing, and system testing. Unit testing focuses on a single application, software module or component. Integration testing tests the integration of related software modules and applications, and system testing tests the hardware and software components of the systems as a whole. These tests are performed using procedures developed in accordance with PECON guidelines for Y2K testing, and determine whether the item is Y2K ready or requires remediation.

PECON is performing validation testing to confirm that the system is capable of performing its intended function. Validation is performed either subsequent to remediation or when the detailed assessment determines that the system or component is Y2K ready with need for modification.

2.8 Remediation or Replacement

The purpose of remediation is to retire, replace, or modify items identified as not Y2K ready during the detailed assessment. Any changes during remediation will follow the existing PECON change process and quality assurance control guidelines. The PECON change process includes the requirement to specify new spare parts that will be required for the installation, testing, start-up and maintenance of the new equipment and to identify and remove obsolete spare parts.

PECON identified 54 systems needing remediation at both LGS and Peach Bottom. PECON stated that the schedules for remediation are being pursued aggressively. Remediation of all 54 systems is scheduled for completion by June 30, 1999, with exception of four systems scheduled for completion after July 1, 1999, as follows: (1) the plant security computer, (2) hand geometry units, (3) personnel dosimetry system (RADOS), and (4) the radiation and meteorology monitoring system (RMMS). The audit team determined that remediation of these systems appears reasonable in accomplishing LGS readiness to operate on January 1, 2000.

2.9 Regulatory Considerations

PECON stated that the Y2K readiness program guidelines for LGS indicated that any system changes or modifications developed as a result of the Y2K program will be implemented using existing approved PECON procedures, which include the necessary reviews against the requirement of 10 CFR 50.59. PECON also stated Y2K problem remediation will employ existing PECON software quality assurance controls and guidelines for software modification configuration management.

The audit team reviewed the PECON Y2K program guidelines and found that they did not clearly identify the applicable plant documents for the Y2K team members to follow during the remediation. However, from the interviews with the Y2K team members, the audit team found that the Y2K team members and plant staff routinely use the existing LGS procedures and employ the existing required software A controls for Y2K remediation efforts. The audit team reviewed the appropriate plant procedures, and confirmed that the documents address the necessary regulatory requirements of 10 CFR 50.59, 10 CFR 50.72, 10 CFR 50.73, 10 CFR Part 21, and 10 CFR Appendix B for modification reviews, reporting of failures and defects, and quality assurance.

2.10 Contingency Planning

The purpose of contingency planning is to provide a process for reducing the risks associated with unanticipated Y2K-induced events. Contingency planning includes contingency plan management, development, and integration. Based on the source of risk, contingency planning is divided into three categories: remediation risk, internal facility risk, and external risk.

PECON has begun contingency planning following the guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." On October 28, 1998, PECON issued Guidelines for Year 2000 Contingency Planning, Revision 1. The issued guidelines defined the program and laid out the implementation and documentation requirements. Attachment 5 shows how the contingency planning team will be organized. PECON will also establish a contingency risk evaluation panel to guide the contingency planning team and to make the final decision regarding which contingency plans will be developed. Presently, the LGS contingency planning process is scheduled to be completed by July 1999. In addition, training of LGS staff on contingency plans will continue through the second half of 1999.

2.11 Y2K Program Management

All LGS systems are scheduled to be Y2K ready or compliant by July 1999, except for the four systems previously discussed. These systems are on the "watch list" and their Y2K readiness status is actively followed by management. As of November 6, 1998, the Y2K readiness project team completed the inventory and initial assessment. The audit team found that Y2K activities and the overall progress of the Y2K program are actively followed by corporate managers through quarterly, monthly, biweekly, weekly, and daily meetings. During these meetings, the project schedule is updated and any issues requiring management attention are identified.

2.12 Electric Grid Issues:

PECO Energy Distribution (PED) briefed the audit team on its Embedded Technology (ET) Project, which is the Y2K readiness project for PECO' s transmission and distribution systems. PED stated that the ET project began on June 1, 1998, with support from PECON's Y2K team members. PECON's support includes training, planning, and assisting in performing some of the Y2K readiness activities.

PED's ET team consists of one coordinator, one engineer, an analyst, two senior field technicians, and one vendor field technician. The team surveyed 570 substations and identified 3000 embedded components. These components consist of 150 different types of equipment. An initial assessment of these 150 types of embedded components identified 75 different types needing further Y2K susceptibility testing.

Testing and remediation of PED embedded systems is scheduled to be completed by the end of the second quarter 1999. In addition, contingency plans for power distribution are scheduled to be completed by April 9, 1999. Attachment 6 shows the detailed schedule and progress of the various PED Y2K activities.

The audit team was briefed by the PED power staff on the operating plan for Y2K grid availability. The PED staff stated that its operating plan will address power load, generation, transmission, and interchange. Load covers how much power needs to be generated during the Y2K rollover period. Generation covers what power generation mix would provide the required power at the lowest risk during the rollover period. Transmission covers actions necessary to provide sufficient grid voltage. Interchange covers actions for grid stability whether PECO is tied to the Pennsylvania, New Jersey and Maryland grid or not. Each of these areas interacts with each other so that when one area is affected by Y2K-related problems, other areas will support the affected area.

The above four areas will be developed in three phases. During the first phase, PED will define the basic elements of the plan, develop a range of scenarios, and determine the risk and impacts. During the second phase, PED will develop the operating plan by performing system studies to test the Phase 1 scenarios, revising scenarios as necessary based on up-to-date information, training personnel, and conducting Y2K-related drills where appropriate. Finally, during the third phase, PED will test equipment where practical, develop a commitment strategy, and implement the overall Y2K readiness operating strategy.

The audit team finds that the PED Y2K effort to address grid availability is appropriate.

3.0 Observations

The following observations were made by the audit team of the PECON Y2K project:

1. The licensee's Administrative Guideline is a comprehensive document and is based on the guidance contained in NEI/NUSMG 97-07 and NRC GL 98-01. The PECON documents listed in Attachment 1 provide appropriate procedures for performing the various Y2K readiness activities. In addition, the PECON Guideline for Year 2000 Contingency Planning is a comprehensive document and is based on the guidance contained in NEI/NUSMG 98-07. The audit team finds that the licensee is using effective planning practices to develop the LGS Y2K contingency plans. The feedback from internal and external audits and interactions with other utilities and industry organizations should continue to enhance the PECON Y2K Program.
2. The Y2K readiness program is receiving an appropriate level of senior management's support and oversight. The Y2K activity schedules and status are actively followed by corporate managers through quarterly, monthly, biweekly, weekly, and daily meetings. During these meetings, the project schedule is updated and any issues that need management attention are identified.
3. Currently, 54 systems require Y2K remediation. Of these 54 systems, all are scheduled to be Y2K compliant or ready by July 1, 1999, except the (a) plant security computer, (b) hand geometry units, (c) RADOS, and (d) RMMS. The audit team determined that this would not impact Y2K readiness of LGS to operate on January 1, 2000.
4. The two safety-related computer-based systems at LGS, the General Electric NUMAC steam leak detection system and the GA Technology/Surrento radiation monitoring systems are Y2K ready. The Y2K problem impact on the remainder of LGS safety-related instrumentation and control is minimal because LGS uses almost entirely analog technology for actuation and control of safety functions.
5. The audit team found that the PECON Y2K project team was not using the initial assessment template as stated in the PECON Guideline for Classification and Characterization of System Inventory. The audit team discussed this discrepancy with the PECON staff and found that the project team had obtained the data required by the PECON Y2K guidance for initial assessment documentation but had used a different format. In addition, the audit team found that the template was subsequently included in the PECON Y2K project documents after completion of the initial assessments. In response to this finding, PECON revised its guidelines to require use of the template for all future equipment initial assessment. In addition, the Y2K plan and guidelines contain the statement that remediation and implementation efforts are to be performed using appropriate software modification and administrative controls and procedures. The audit team found that the Y2K team members and plant staff routinely use the existing software modification procedures and administrative controls for Y2K remediation effort.

Attachments and Tables

Attachment 1

Documents Reviewed

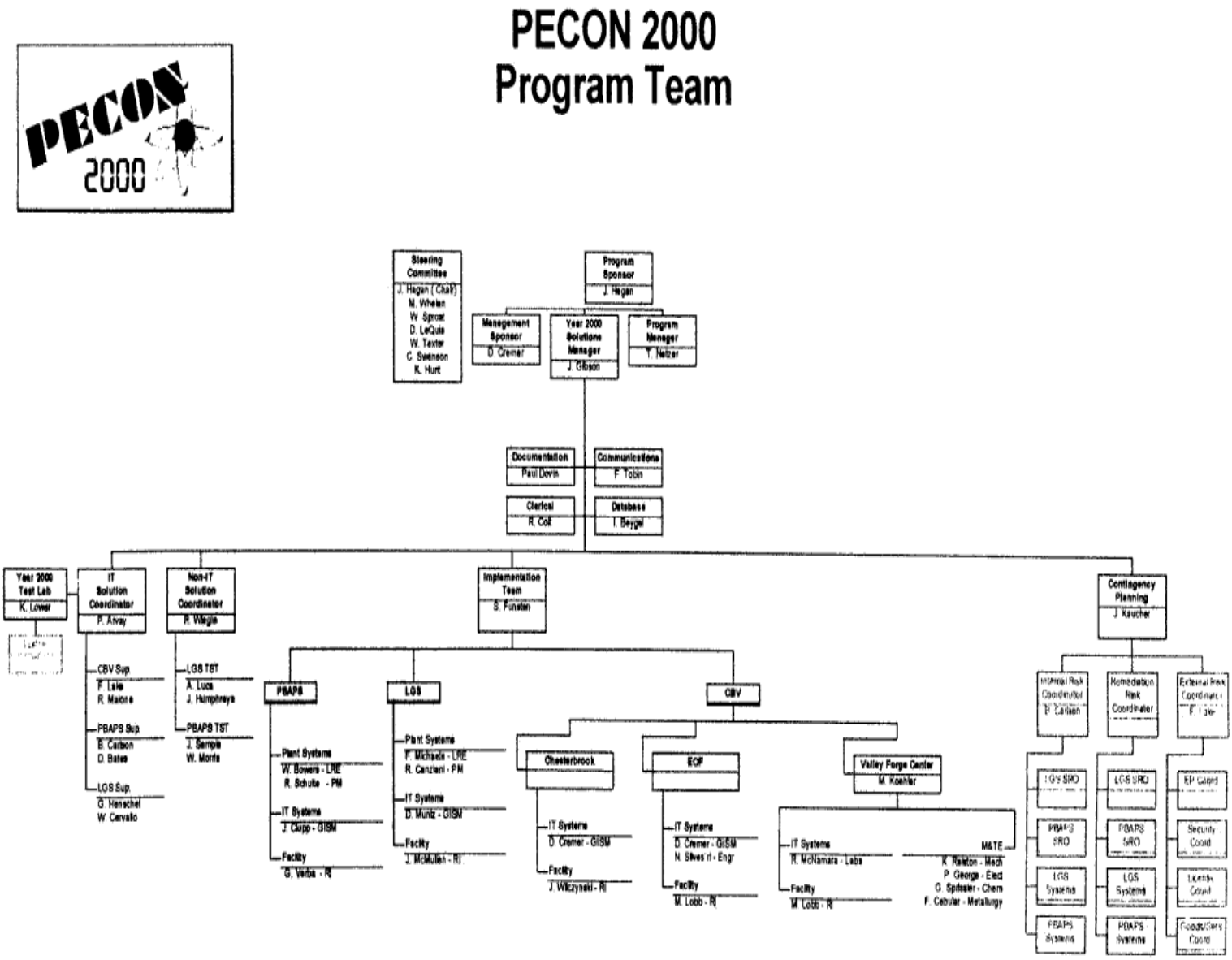
- PECON 2000 Program Plan, Revision 0-0, Issued 11/12/97
- Administrative Guideline, Y2K-AG-210, Revision 0-0, Issued 10/27/98
- Guideline for Identification, Assessment, Remediation and Validation, Y2K-CG-310, Revision 2-1, Issued 10/28/98
- Guideline for Classification and Characterization of Systems Inventory, Y2K-CG-311, Revision 2-0, Issued 10/27/98
- Testing Guideline for Embedded Systems, Y2K-TG-410, Revision 0-1, Issued 10/28/98
- Guideline for Validation of Plant Systems, Y2K-GL-430, Revision 0-0, Issued 10/28/98
- Information Technology (IT) Testing Guideline for Computer Systems, Y2K-CG-510, Revision 2-0, Issued 10/27/98
- Guideline for Year 2000 Contingency Planning, Y2K-CG-610, Revision 1-0, Issued 10/28198
- Guideline for Remediation Risk Contingency Planning, Y2K-CG-611, Revision 1-0, Issued 10/27/98
- Guideline for Internal Facility Risk Planning, Y2K-CG-612, Revision 1 -0, Issued 10/27/98
- Guideline for External Risk Planning, Y2K-CG-613, Revision 1-0, Issued 10/27/98

Attachment 2

Name	Representing	Phone
NRC		
Chiramal, Matthew	NRR - Lead	
Lee, Eric	NRR -	
Cahill, Chris	Region I	
PECO		
Arvay, Patrice	IT Solution Coordinator, PECON 2000	5491
Canziani, Rich	Y2K Project Manager, Limerick GS	802:2807
Farrington, Bob	Manager, EMS Support	801:6301
Funsten, Steve	Y2K Implementation Mgr., PECON 2000	d6125
Galatola, Mickey	Y2K Program Director, PECO Energy	801:5865
Gibson, Jack	Y2K Project Manager, PECON 2000	6234
Goebel, William	NQA	802:3918
Hoefner, Dave	Y2K Program Manager, PECO Energy	801:4165
Kaucher, Jim	Contingency Planning Coord, PECON 2000	6092
Koehler, Mike	Y2K Project Manager, Corporate Laboratories	803:7235
LeQuia, Darryl	Director, LGS Site Support	802:3030
Loomis, Thomas	Licensing	6793
Lower, Kelly	Y2K Test Lab Manager, PECON 2000	6957
Matthews, Cassandra	CIO, PECO Energy	801:6619
Muntz, Debbie	Group IS Manager, NISD Limerick	802:3757
Netzer, Terry	Program Manager, PECON 2000	6052
Whelan, Mark	Director, Nuclear Information Systems	6905
Wiegle, Reed	Non-IT Solution Coordinator, PECON 2000	6050

Attachment 3

Organization Chart of the PECON 2000 Program Team



Attachment 4

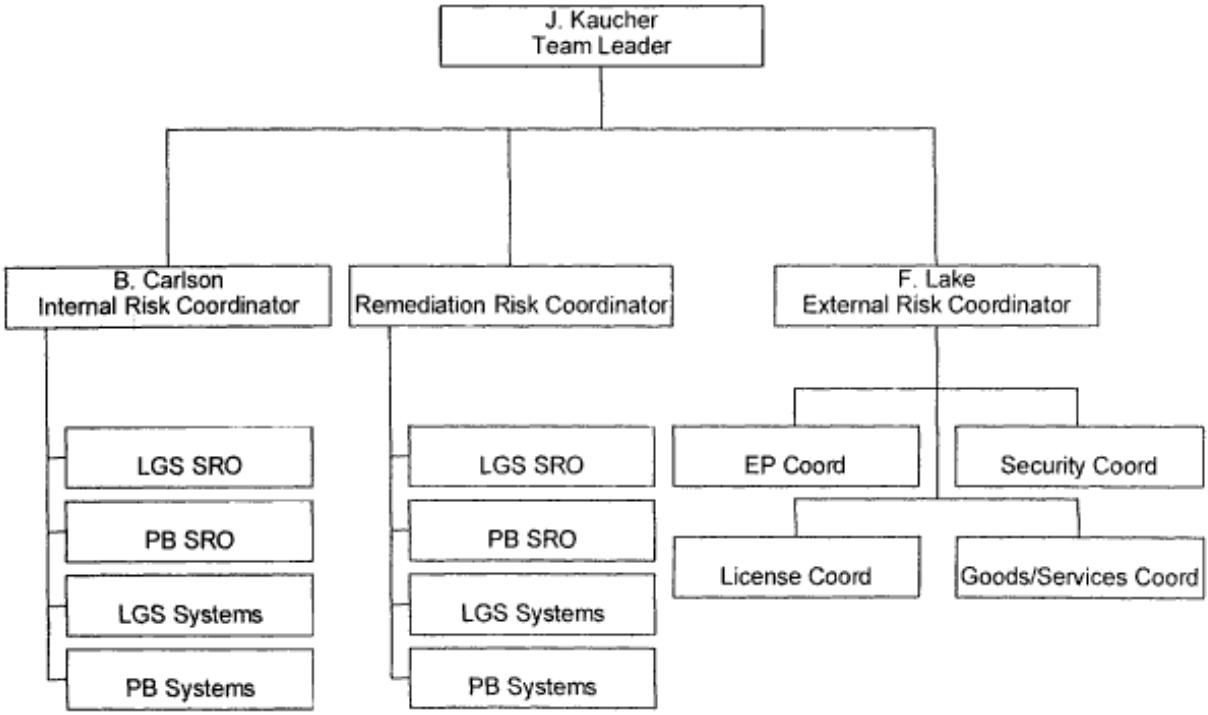
Y2K Organization chart of the PECON 2000 Program Team

PECON 2000 Program					
ROLES					
Title	**Steering Committee**	**Program Manager**	**Year 2000 Solution Manager**	**IT Solution Coordinator**	**Non-IT Solution Coordinator**

Responsibilities	Description	• Provides High Level Business Focused Guidance for Team Activities • Conducts System Review of "Mission Criticality" and Prioritization • Critical Review of Program Actions, Processes and Checkpoints • Conducts Management "System Risk Review"	• Provides Program Management for Schedule, Budget, and Resources	• Lead Responsible Manager (LRE) • Conducts Senior Management Program Update Presentations • Provides PECON Representation on PECO Year 2000 Team • Manages PECON 2000 awareness campaign • Manages PECON 2000 system database • Maintains PECO Y2K database • Approve Selection of Technical Screening Team	• Coordinates IT system readiness methodologies and documentation across all PECON Sites • Conducts evaluation and selection of testing tools • Maintains system status in PECON 2000 database • Coordinates and recommends system Readiness Strategy • Maintains integrated schedule for IT system implementation	• Coordinates Non-IT System Readiness Methodologies and Documentation Across all PECON sites • Maintains System Status in PECON 2000 Database • Manages Technical Screening Team Resources • Coordinates and Recommends System readiness strategy
	Deliverable		• Program Plan • Program Schedule • Overall Budget	• Year 2000 Readiness Administrative Guideline • Y2k Test Lab Budget • System Implementation Schedule • Due Diligence Documentation • Readiness Status PI's • Y2K Database Reports	• Sample System Test Plans • System Readiness Schedule	• Sample System Test Plans • System Readiness Schedule
	Interfaces	• PECON Senior Management • PECON 2000 Managers	• Steering Committee • Year 2000 Solution Manager • PECO Y2K Program Manager	• PECO Y2K Program Manager • PECON 2000 Program Manager • Solution Coordinators • Steering Committee	• PECON 2000 Solution Manager • Y2K Test Lab Manager • Site Solution Resources	• PECON 2000 Solution Manager • Technical Screening Team • Site Solution Resources

Attachment 5

PECON 2000
Y2K Contingency Planning
Staffing/Organization

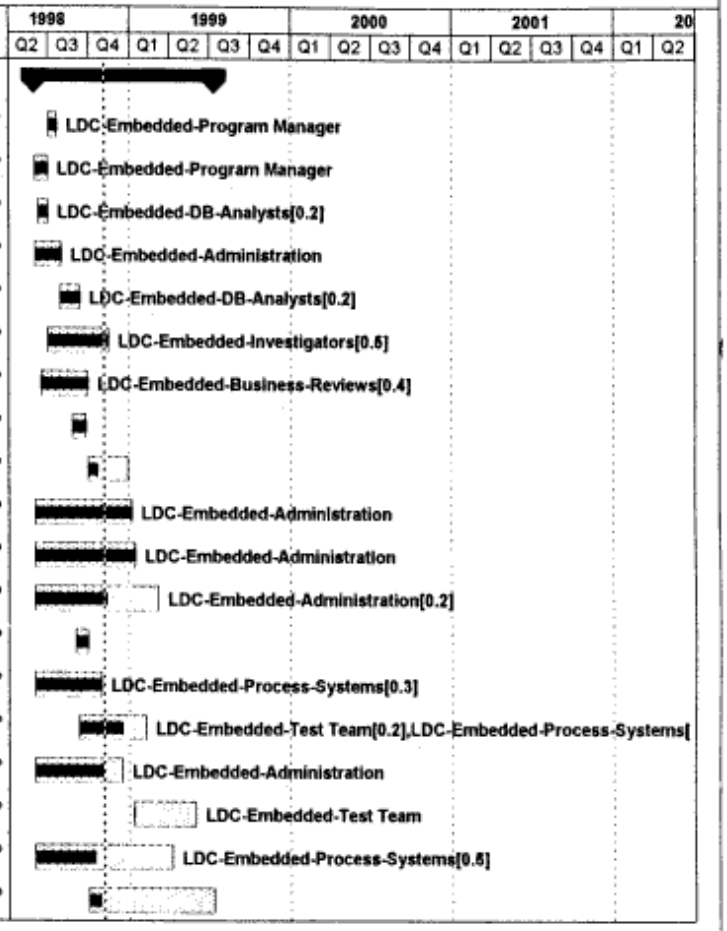


Attachment 5

Attachment 6

E.2.S.9 YR2000 - EMBEDDED TECHNOLOGY

ID	Text3	Task Name	Durat	Finish	% Complet
1	Y2K Modify	Embedded Systems	283d	Mon 7/12/99	54%
2		Identification of Team Members	15d	Wed 7/22/98	100%
3		Resources Identified	23d	Wed 7/1/98	100%
4		Identify Database/tools needed	180d	Wed 7/1/98	100%
5		Staffing in place	45d	Fri 7/31/98	100%
6		Database for embedded systems	330d	Fri 9/11/98	100%
7		Commence PECO Inventory	98d	Sun 11/15/98	100%
8		Inventory assessment/criticality	78d	Wed 9/30/98	100%
9		Inventory Co-Gens and Pole-tops	25d	Fri 9/25/98	100%
10		Inventory Major Customers (top 44)	62d	Wed 12/30/98	25%
11		Vendor Letter Campaign	154d	Thu 1/7/99	100%
12		Retirement documentation	165d	Fri 1/15/99	100%
13		Vendor intervention follow-up	196d	Tue 3/9/99	60%
14		Interface w/ EPRI website/database	22d	Wed 9/30/98	100%
15		Testing Methodology (ECS/DMACS/GAS)	110d	Fri 10/30/98	100%
16		Testing (ECS/DMACS/GAS)	105d	Tue 2/9/99	66%
17		Testing Schedule	142d	Thu 12/17/98	80%
18		Testing Embedded systems	100d	Tue 6/1/99	2%
19		Contingency Plans	219d	Fri 4/9/99	45%
20		Y2K Remediation	195d	Mon 7/12/99	10%



Project: Embedded.MPP
Date: Wed 11/4/98

Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress

Page 1

Table 1 - Software Items

System Name	Classification	Priority/Plant Operation Impact(OPS)	Detailed Assessment	Y2K Compliant/Ready
LTAFLA	Class 1	Priority 3	Performed	Yes
LGS Penetration Seal Tracking	Class 1	OPS = NA	Performed	No Data base program Obtained Y2K information from vendor is sufficient
Scram Timing Evaluation	Class 1	OPS = 4	Performed	Yes
OPTIX	Class 1	OPS = 4	Performed	Yes
PERMON	Class 1	OPS = 4	Performed	No Being remediated

3D Monicore	Class 1	OPS = 2	Performed	No Will be upgraded
MOV Trending	Class 2	Performed test	Performed	Yes
Plant Information Monitoring System (PIMs)	Class 2	Priority 1	NA Initiated Y2K program for PIMS	No Remediation Completed
SCRITS System	Class 2	OPS = 2	Performed	Yes
Deep Bed Demin. Control System	Class 2	Priority 1	Performed	Yes
P3 Primavera/PIMS Interface	Class 3	OPS = 3	Performed	Yes
Voltage Drop Program	Class 3	NA Not Mission Critical	Not Performed	NA No further action is required
Rebecca Program	Class 4	NA Not Mission Critical	Not Performed	NA No further action is required
LABCALCS	Class 4	OPS = 4	Performed	Yes
Ionics Desktop Computer	Class 4	OPS = 4	NA	Obtain Y2K verification from vendor
Quest Noise Monitor	Class 4	NA Not Mission Critical	Performed	Yes

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Table 2-Embedded Components

Component	**Vendor**	**Comments**
Bramshaw Master Programmable Logic Control	Reliance Electric Component.	Y2K Comply/ Does not have a clock function
Seismic monitoring System Computer	Kinemetric Inc	Has clock function. The vendor is in the process of performing Y2K compliance testing. Based on the vendor's evaluation of similar equipment, PECON is planning to update the equipment.
Steam Leak Detection Temp. Monitor	General Electric	Y2K Compliant/ GE evaluated the equipment and found the system does not perform date factions.
Input Measurement Card	Zeefax Inc. (Solartron)	Y2K Compliant/Does not have a clock function
Rod Sequence Control System Panel	General Electric	Not Applicable/ This equipment has been deleted from Unit 1 and never existed on Unit 2.

Redundant Reactivity Control System Logic Cabinet	General Electric	Y2K Compliant/ GE evaluated Y2K assessment for BWR Owner's Group and determined that Limerick's RRCS firmware does not contain Year 2K defects.
Suppression Pool Temp	Simmonds Precision Instrumentation System Division (SPTMOS)	The SPTMOS is scheduled to be replaced prior to the Y2K.
Drywell Sump Tank Level Monitoring System	Foxboro	Y2K Compliant/Does not have a clock that utilizes or provides date function
Feed Water and Recirculation Board and UPS	Best Power Technology	Ready with correction/UPS will continue to function but will require that the data parameters be reset following the rollover to the Y2K
Digital Controller	Nutherm International	Y2K Compliant/Does not use a date function
Rod Worth Minimizer (NUMAC)	General Electric	Y2K Compliant/both units at LGS do not make use of the timing option.
Recorders for various systems. (Too many to list)	Westronics	Y2K Ready/Three versions of Recorder Compliant version - use as is Ready version - use with administrative control Upgrade version - Recorder referred to as Westroics (Yokogawa Replacement) on the attached list of the detailed assessment will be replaced with Yokogawa Recorders prior to January 1, 2000.
Flow Control/Loop Control	Bailey-Fisher & Porter	Y2K Ready/ PECON tested the equipment (not up to PECON 2000 guidelines) and recommended "use as is"
Control Enclosure Chlorine detector	Anacon (KWJ Engineering)	Compliant/clock ,which provides date information, is not used
RHR SW LOG count rate Radiation Monitor/Steam Leak Detection Temp. Monitor/Off Gas Sample Chamber/Main Steam Line Radiation/Air Ejector & Holdup Pipe Discharge (NUMAC)	General Electric	Y2K Compliant/Does not process any date

Condensate Feedwater Temp ITF/Remote Selector Bank/CRDHS Control Rod Drive/FW Heater Temp Indicator	Tracor Westronics	Y2K Ready/Two Models MX-60 - does not process calendar date. DDS 7800 - does process calendar date for display only. It makes no use of the date for any calculation. Requires administrative control.
Suppression Pool Temperature/Panel Supp. Pool Temp. & Cont. Atmos. Monitoring	Simmonds Precision Instrument System Division.	Replace/No detailed assessment/the equipment is scheduled to be replaced prior to the Y2K

February 9, 1999

Mr. Charles M. Dugger
Vice President Operations
Entergy Operations, Inc.
P. O. Box B
Killona, LA 70066

SUBJECT: YEAR 2000 PROBLEM AUDIT REPORT FOR WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. MA1905)

Dear Mr. Dugger:

From December 14 through 17, 1998, the Nuclear Regulatory Commission staff conducted an audit of the Year 2000 (Y2K) readiness program at the Waterford Steam Electric Station, Unit 3 (Waterford 3) in accordance with the audit plan for this activity. Our Year 2000 problem readiness audit report for Waterford 3 is enclosed. The observations noted in the report were discussed with your staff at the exit meeting held on December 17, 1998.

If you have any further questions, please contact me at (301)-415-3025.

Sincerely,

/S/

Chandu P. Patel, Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: As stated
cc w/encl: See next page

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation (Nrr)

Audit Report

on

Implementation of Generic Letter (Gl) 98-01

"Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

Docket No:	50-382
License No:	NPF-38
Licensee:	Entergy Operations, Inc.
Facility:	Waterford Steam Electric Station, Unit 3
Location:	Killona, LA
Dates:	December 14-17, 1998
Audit Team Members:	Michael E. Waterman, NRR Matthew Chiramal, NRR
Approved by:	Jared S. Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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- Executive Summary
- 1.0 Introduction
- 2.0 Waterford 3 Y2K Project Description

- 2.1 Project Organization
- 2.2 Project Plan
  - 2.2.1 Awareness
  - 2.2.2 Asset Identification/Inventory
  - 2.2.3 Asset Classification and Prioritization
  - 2.2.4. Detailed Assessment
  - 2.2.5. Y2K Testing
  - 2.2.6 Remediation
  - 2.2.7 Validation and Certification
  - 2.2.8 Regulatory Considerations
  - 2.2.9 Contingency Planning
  - 2.2.10 Y2K Program Management
  - 2.2.11 Electric Grid Issues
  - 2.2.12 Critical Suppliers
- 3.0 Audit Team Observations
- Tables and Attachments

Executive Summary

From December 14 through 17, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) readiness program at the Waterford Steam Electric Station, Unit 3 (W3) in accordance with the audit plan for this activity. The purpose of the audit was to (1) assess the effectiveness of the Entergy Operations, Inc. (EOI) program for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the W3 Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the W3 Y2K readiness program, the following observations were made:

EOI has a common Y2K project implementation plan for all its nuclear facilities including W3. The W3 Y2K project plan entitled "Year 2000 Project Guide Y2K-001," establishes the scope and control of the Y2K Project at the W3 plant. The Y2K project plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness, " and NRC GL 98-01.

The licensee was preparing for a refueling outage scheduled in February 1999 at the time of the NRC audit. Consequently, the systems and operations staff and particularly the mid-level management, whose support is necessary for addressing Y2K issues at W3, were not as available as at other plants. Directed support from the W3 Y2K project sponsor and upper management will continue to be necessary to expedite Y2K program progress at W3. The licensee agreed with this observation and has committed to provide more aggressive management oversight of the Y2K project.

The licensee began the formal W3 Y2K readiness program in June 1997, and finished the plant inventory and initial assessment phase in May 1998. The detailed assessment phase for systems and components that are mission critical is scheduled to be completed by December 31, 1998. Confirmatory testing of mission critical systems for Y2K readiness is conducted by the licensee at the plant site. Remediation of mission critical systems has begun. No Y2K problems have been identified in safety-related systems to date.

The Entergy Global Year 2000 policy requires that all Mission Critical asset work projects be completed by December 31, 1998, and the work projects for Important assets be completed by June 30, 1999. However, the audit team noted that, of the 8 Mission Critical application software items, 4 will be completed in April 1999, and of the 275 Mission Critical embedded items in 25 work projects, 8 work projects are scheduled for completion by June 1999. Thus, the initially established deadline for the Mission Critical assets will not be met at W3, and this may impact the deadline for completing the Important asset work projects. Additionally, there does not appear to be sufficient flexibility in the schedules to account for unforseen delays in completing the work projects.

To address the above schedule conflict, the licensee established a revised schedule for Y2K readiness of mission critical and important system projects by June 30, 1999. The audit team believes that, with the additional resources the licensee plans to obtain in the immediate future, the above Y2K readiness schedule appears to be achievable. This conclusion is based on the expertise and experience of the present W3 Y2K project team members, support from management, and support available via information sharing and interactions with EPRI, other licensees, the Combustion Engineering Owners Group (CEOG), plant vendors, the Southeast Electricity Reliability Council, and the North American Electric Reliability Council.

The licensee has just started Y2K contingency planning, and is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort. The W3 contingency plan is scheduled for completion on June 30, 1999. The W3 plan will be incorporated into the EOI plan format with a single corporate plan for Y2K contingencies and site-specific plans for each facility connected to the EOI grid. EOI will be providing the milestones for identifying the risks, analyzing the risks, and creating the plans. At present, the licensee has assigned one person part-time as lead for W3 Y2K contingency planning with support from two Y2K project team members. The audit team considers that the schedule for completion of detailed contingency planning may be adversely impacted by the refueling outage activities and other Y2K readiness activities. The audit team believes that additional resources are needed to support W3 Y2K contingency planning activities in order to meet the established W3 Y2K project schedules. The licensee has committed to provide additional resources on contingency planning in order to meet the above schedule.

An independent assessment of the W3 Y2K project plan was performed by the licensee on October 19-21, 1998. Recommendations from that assessment are being addressed by the W3 Y2K project team in subsequent revisions of the W3 Y2K project plan. The audit team reviewed the W3 Y2K Project team draft response to the recommendations of the assessment report and believes the proposed corrective actions should address the recommendations adequately.

The Y2K project documentation system used at W3 is well-organized. Related applications and embedded systems are combined into work project documentation packages. The documentation is maintained in an electronic database. Documents not produced on the system are scanned into the database. The database is backed-up on a weekly basis. Upon completion of the project, the documentation is printed and inserted into a hard-copy file, with a summary of the activities that were performed. The documentation in the completed work project includes a summary of the work performed and permits a rapid review of the Y2K activities status and conclusions for each project.

1.0 Introduction

The objectives of the W3 Y2K readiness program audit were to:

1. Assess the effectiveness of the W3 program for achieving Y2K readiness, including continued safe operation of the W3 plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems,
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and,
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan outline (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL 98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"
- Prior to the audit at the plant site, the audit team obtained and reviewed the W3 Y2K Project Plan, Rev. 3, dated November 23, 1998. The team also reviewed the W3 Readiness Assessment Report dated November 6, 1998, which provided the conclusions and recommendations of an assessment of the W3 Y2K Program by an independent team of auditors.

The audit process started with an entrance meeting attended by the W3 Y2K Project Manager (PM), Y2K project team members, senior and other site personnel, and members of the audit team. Attachment 3 is a list of the attendees. Margit Triggs, the W3 Y2K PM, described the project organization, the project plan and its implementation, project status, and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the W3 project plan and its associated procedures, the plan implementation products (documents and data bases), and interacted with the Y2K PM, W3 Y2K project team members, and members of the EOI Y2K project team. The documents reviewed and referenced in this audit are listed in Attachment 2.

2.0 Waterford 3 Y2K Project Description

2.1 Project Organization

The EOI Y2K readiness program at W3 has approximately15 full-time equivalent persons supporting the W3 part of the EOI Y2K project, with these resources distributed among the W3 Y2K project team, management, and system engineers. The W3 Y2K PM reports to the W3 Y2K project sponsor (Mr. R. Burski), who is the Director, Site Support. Mr. Burski reports to the W3 Vice President of Operations (Mr. C. Dugger). The PM stated that the sponsoring efforts have been important to the W3 Y2K program.

The licensee participates with other organizations that are addressing the Y2K problem. The licensee has received support via participation in the EPRI Y2K program, interfacing and sharing information with other licensees, the Combustion Engineering Owners Group, NEI/NUSMG, system vendors, the Southeast Electricity Reliability Council, and the North American Electricity Reliability Council.

2.2 Project Plan

The W3 Y2K project plan, entitled "Year 2000 Project Guide Y2K-001," was developed by the licensee to establish the scope and control of the Y2K program, and is applied uniformly at every EOI nuclear power plant. The W3 Y2K project plan is based on the guidance provided in NEI/NUSMG 97-07, which was accepted by the NRC in NRC Generic Letter 98-01 as guidance that presents one approach for achieving Y2K readiness. The audit team's review confirmed that the W3 Y2K project plan is based on the guidance contained in NEI/NUSMG 97-07.

The W3 Y2K project plan consists of several phases gathered into the following groups: Asset Identification, Categorization, Screening and Inventory; Asset Classification and Prioritization; Detailed Assessment; Asset Testing and Post Remediation Testing; Asset Remediation; Asset Validation and Certification; and Contingency Planning.

The schedule of W3 Y2K readiness efforts is provided in Table 1.

An independent assessment of the W3 Y2K project plan was performed October 19-21, 1998. Recommendations from that assessment are being addressed by the W3 Y2K project team in subsequent revisions of the W3 Y2K project plan.

2.2.1 Awareness

The EOI Y2K program, which addresses all EOI nuclear plants, began in June 1997. The licensee has undertaken efforts to brief W3 management, educate the general population of W3 personnel via departmental newsletters, train personnel who are to perform inventory and assessment activities, and coordinate Y2K team communications. The audit team reviewed samples of "Inside Entergy" (a W3 employees' newsletter) and presentation material used at meetings with management and all-site personnel and at continued training sessions for site personnel. The audit team also reviewed several project status reports issued by the Y2K PM to keep management informed of the schedule and cost of the project and significant activities and issues.

2.2.2 Asset Identification/Inventory

The Y2K Project Team, with assistance from plant personnel, identified W3 assets that are potentially vulnerable to Y2K date problems and included them in the inventory database, Y2K Asset Index (AI). The inventory was screened and categorized as either Active or Inactive based on whether the asset was considered Y2K vulnerable.

The inventory of potentially affected applications and embedded plant systems/components was developed by plant personnel familiar with each plant system/functional area. In the identification of embedded systems, the licensee reviewed the procedures and documentation for the existence of an internal clock or processor, surveyed the vendors for information on their equipment, performed system walk-downs, and reviewed schematics, program listings, and reference manuals on various instrumentation and control systems.

2.2.3 Asset Classification and Prioritization

An Asset Classification Checklist was used to ascertain the level of mission criticality of each asset on the basis of four broad categories of consideration, as follows:

- Regulatory - Addresses any concerns of the impact of the failure of the asset on regulatory requirements or commitments.
- Power Operations - Addresses any concerns related to the assets potential impact on continued power operations.
- Cost Concerns - Addresses any concerns related to increased burden on W3 department staffing or budgets.
- Industrial Safety - Addresses any concerns related to personnel safety and potential plant equipment degradation.

Each question on the Asset Classification Checklist must be answered "Yes" or "No." Based on the responses to the questions, a

classification is made, as follows:

- Mission Critical - An asset that, if lost and for which there is no timely remedy, would disable or otherwise adversely impact the ability of the Entergy system to: (a) operate in a safe manner, (b) provide service to customers, (c) generate revenue, or (d) avoid legal exposure.
- Important - An asset is considered Important if it is not Mission Critical but places an unanticipated operational requirement on plant operators, causes some degree of regulatory impact, has moderate cost impact, or has a wide scope of usage.
- Desirable - An asset is considered Desirable if it is not Mission Critical or Important.

If the asset is Mission Critical or Important, a Y2K Documentation Package is required for certification of the asset. A Y2K Documentation Package Number is assigned by the Y2K Project for tracking purposes. The classification of each asset is also entered into the Y2K AI. The Y2K Project Team prioritizes the certification of the asset based on its classification and availability, and determines the scope and schedule for certification. The Y2K team also confirms the priority, classification, and Y2K vulnerability of the asset prior to detailed assessment activities.

During the analysis of the initial assessment, the licensee evaluated the failure risk of each item as the basis for assigning the priority; recommended the approach/plan for detailed assessment, testing, and remediation; and estimated the detailed assessment/remediation cost. Unless specifically noted otherwise, the licensee did not formally assess and remediate desirable items. Remediation of these items may be done as time and resources permit.

Mission critical and important items will be verified to be Y2K compliant or ready by the deadline date of June 30, 1999. Desirable items will not be verified to be Y2K compliant or ready by the deadline date.

The licensee identified 8 mission critical and 35 important applications that are potentially affected by the Y2K problem. The licensee also identified 272 mission critical and 365 important embedded systems that are potentially affected by Y2K problems. Assessment/testing has been completed for nearly all of the mission critical software applications, embedded devices, and spare parts identified by the licensee. Assessment/testing has not been completed for the software applications, digital devices and spare components important to operations. Table 2 provides a list of mission critical software systems reviewed by the audit team. Table 3 lists the embedded devices that were reviewed by the audit team.

2.2.4. Detailed Assessment

Detailed assessments consist of source code examinations, review of vendor certifications and tests, testing systems in-house, and review of industry group certifications and tests. Vendor evaluations encompass evaluation of available manufacturer/developer information (such as contracts, correspondence, vendor manuals, Internet listings, and vendor owners groups), communications with vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Test evaluations involve the development of test procedures and acceptance criteria to determine whether a Y2K problem exists.

The licensee was scheduled to complete its detailed assessment and certification of mission critical items by December 31, 1998. This schedule has not been met because the licensee is installing new equipment during the in February 1999 refueling outage, and testing and remediation cannot be completed without this equipment. Of the 8 Mission Critical application software items, 4 will not be completed until April 1999; and, of the 275 Mission Critical embedded items in 25 work projects, 8 work projects are scheduled for completion by June 1999.

The detailed assessments performed to date follow the project implementation plan. The audit team found the licensee's documentation sufficient for justifying the results of the detailed assessments, which established Y2K compliance/non-compliance and readiness of systems. The licensee is scheduled to complete Y2K detailed assessment, remediation, and testing of systems and equipment important to operations by June 30, 1999.

2.2.5. Y2K Testing

Y2K problem susceptibility testing is based on the licensee's determination of the importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information. Mission critical assets classified as compliant, ready, or accept-as-is are validated by testing. The licensee's Y2K project team developed the onsite testing procedures to ensure consistency in the implementation of Y2K susceptibility testing.

Y2K testing and remediation testing is conducted in accordance with the licensee's Y2K test plan which includes, as appropriate, date setting, date roll-over of all high risk dates in powered up and powered down states, date calculations, date comparison and sorting during and following high risk dates, and date interfaces. If an asset passes all portions of the testing, the asset is categorized as compliant, ready, or use-as-is.

In certain cases, when plant equipment is also present in the plant simulator, the simulator equipment is used as the base test equipment, and the plant equipment is then certified Y2K ready by its equivalence to the simulator equipment. Equipment and firmware technical

manuals and data under configuration control is the most frequently used source of information for determining equivalence between equipment. The audit team found the licensee's use of available technical manuals and data to be acceptable.

The auditors found only minor documentation discrepancies in some equipment test packages. These discrepancies did not indicate an adverse trend in Y2K certification practices or failure to properly identify Y2K problem susceptibility.

2.2.6 Remediation

Remediation is the process of retiring, replacing or modifying software or embedded software devices that are to be retained in service, but have been determined to be affected by the Y2K problem. The program implementation plan provided Y2K compliance criteria for replacement or modification. After remediation is completed, validation testing is required. The licensee is performing the required Y2K remediation validation testing using the test procedures and test plans developed by the W3 Y2K project. The resulting certifications are acceptable.

If an asset is to be replaced or modified due to Y2K non-compliance or if it fails during testing in an unacceptable failure mode, then a remediation plan is prepared and the remediation effort is implemented using existing plant processes (e.g., engineering requests, software change requests, or condition identification forms). A mission critical or important asset that has been determined to be Y2K non-compliant but maintains an acceptable failure mode and effect, known to have an acceptable failure mode and effect, or remediation still has some areas of non-compliance but maintains an acceptable failure mode and effect, can be certified to be Y2K ready with the development of an acceptable-as-is justification per the Y2K plan.

2.2.7 Validation and Certification

Certification is the completion and documentation of Y2K readiness activities for individual systems and components. This includes documentation of validated system modifications and development of required contingency plans.

Of the 275 Mission Critical embedded items in 25 work packages, 57 embedded items have been completed in 15 packages. Two packages were to be completed by December 31, 1998, and the remaining eight packages will be completed by June 1999.

2.2.8 Regulatory Considerations

The W3 Y2K project plan and associated documents included references to existing plant procedures that have guidance on regulatory considerations, such as applicability of 10 CFR50.59 for plant modification reviews, reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.9 Contingency Planning

The licensee has begun contingency planning using a framework similar to that described in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The EOI corporate project will be providing the milestones for identifying the risks, analyzing the risks and creating the plans. A single corporate plan for Y2K contingencies will be developed and each plant will add site specific plans. Development of risk statements are the current high priority at W3. The contingency plan for W3 mission critical systems and components is scheduled for completion on June 30, 1999. The licensee has committed 0.5 FTE from the Emergency Planning Group to contingency planning, with additional support from two of the Y2K team members. The licensee's schedule for completion of the Y2K project contingency plans is likely to be impacted by the refueling outage scheduled for February 1999 and other Y2K readiness activities for the remaining mission critical and important assets.

The licensee will use the mission critical assets to identify the high priority items periodically needed for contingency planning. W3 has significant emergency response experience because of the preparations for hurricanes and toxic chemical accidents from neighboring plants and river spills. The W3 contingency plan will provide for the staff necessary to undertake the identified actions.

Communications within the EOI grid are through commercial communications systems. These networks are undergoing Y2K readiness evaluation by the companies that own the systems, and are projected to be ready before the end of 1998. The licensee is also planning contingency actions for the unlikely event that communications within the EOI grid are disrupted by Y2K failures. For example, EOI has satellite phones for the transmission operations centers and all nuclear plant emergency response facilities.

2.2.10 Y2K Program Management

The licensee's Y2K program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a format that defines the progress of each Y2K system being evaluated. There have been schedule slippages in the W3 Y2K program, but these slippages have been addressed and accommodated in the program schedule.

The documentation system used at W3 is well organized. Related applications and embedded systems are combined into work project documentation packages. The documentation is maintained in an electronic database. Documents not produced on the system are scanned

into the database. The database is backed up on a weekly basis. Upon completion of the project, the documentation is printed and inserted into a hardcopy file, with a summary of the activities that were performed. This summary provides a review of the Y2K activities and conclusions for each project.

EOI has a common Y2K project implementation plan for all its nuclear facilities. The W3 Y2K project plan establishes the scope and control of the Y2K Project Plan at the W3 plant.

The licensee is preparing for a W3 rfueling outage in February 1999. Consequently, the systems and operations staff, whose support is necessary for addressing Y2K issues at W3, are not available to review Y2K work packages at this time. Directed support from the W3 Y2K Project sponsor will continue to be necessary to expedite Y2K progress at W3. The licensee has committed to provide additional resources on the Y2K project to meet the established schedules.

The Entergy Global Year 2000 policy requires that all mission critical asset work projects be completed by December 31, 1998, and the work projects for Important assets be completed by June 30, 1999. The deadline for the Mission Critical assets will not be met at W3, and this will impact the deadline for completing the Important asset work projects. There does not appear to be sufficient flexibility in the schedules to account for unforseen delays in completing the work projects. The licensee has addressed this issue by obtaining additional Y2K program resources and has set a June 30, 1999 date for completing mission critical and important assets. This revised schedule appears to be achievable with the additional resources.

2.2.11 Electric Grid Issues

The licensee is interacting with the North America Electric Reliability Council (NERC) and the Southeast Electric Reliability Council (SERC) to develop grid stability plans for generation and transmission.

EOI mission critical grid assets are scheduled to be tested and certified by the end of 1998. There are more than 1000 components in the EOI grid, which will be reviewed on a manufacture model/version approach. The licensee will test and certify one component, and extrapolate the results of the testing to the remainder of the inventory. The licensee considered testing more than one component, but factored in the risk of damaging equipment when pulling the boards, and queried the vendors about the differences in "identical" components. The licensee has not found any problems with variations in components that have the same model/version numbers.

EOI grid activities in the first half of 1999 will involve Important assets and contingency planning. There are five regional transmission operation centers, which perform the switching and control of their own region. EOI is working closely with the mainframe manufacturer in the upgrading of the transmission operation centers. All but one center is being upgraded. The other center is to be certified in early 1999.

The Global Positioning System (GPS) receiver at the Beaumont center is being replaced with a Y2K compliant receiver. The GPS receiver provides the standard time, which is used as the base time for monitoring grid frequency.

The licensee has started reviewing blackstart procedures. Coordination portions of the blackstart procedures need to be upgraded. All blackstart procedures will be revised by May 1, 1999. The licensee is currently developing the activities necessary for restoring the grid. An outline of the SERC contingency plan for grid recovery is due to NERC by January 26, 1999.

The EOI grid capacity is approximately 24,000MW, and EOI anticipates a load of 12,000MW on Saturday, January 1, 2000, and 16,000MW on the following Monday. EOI is conducting system studies to look at overall grid stability, and is taking snapshots of grid performance on critical dates. NERC requires four snapshots - 6pm Central time (Greenwich mean time is midnight), midnight Central time, midnight Eastern time, then 2am Eastern time. NERC requires this snapshot for all utilities. This snapshot was scheduled for January 1, 1999. The snapshot will look at frequency, voltage, generation patterns, load patterns, line flows, tie-line flows. The purpose is to develop the models for the system availability studies. The licensee is also studying the dynamic nature of load losses. In April 1999, the licensee will conduct a drill to test the grid communication and backup capabilities. The black start drills will be done in the September 1999 time frame.

2.2.12 Critical Suppliers

The licensee has prepared a list of critical suppliers, and has compared their list to the corporate list of suppliers. Letters have been sent to critical suppliers, but W3 has gotten only a 10-25% response. EOI is following up on the responses. The licensee is planning on stockpiling a 30-day supply of critical supplies as a contingency.

3.0 Audit Team Observations

The audit team reviewed in detail 17 of the 43 mission critical and important to operations software applications (see Table 2). The audit team also reviewed 40 of the 637 mission critical embedded systems and components identified by the licensee (see Table 3). The licensee's documentation was sufficient for justifying the results of the assessments of Y2K compliance/non-compliance.

The following observations were made by the team auditing the EOI Y2K readiness program, as it was applied at W3:

1. EOI has a common Y2K project implementation plan for all its nuclear facilities including W3. The W3 Y2K project plan entitled "Year 2000 Project Guide Y2K-001," establishes the scope and control of the Y2K Project at the W3 plant.

   The Y2K project plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness, " and NRC GL 98-01.
2. The licensee was preparing for a refueling outage scheduled in February 1999 at the time of the NRC audit. Consequently, the systems and operations staff and particularly the mid-level management, whose support is necessary for addressing Y2K issues at W3, were not as available as at other plants. Directed support from the W3 Y2K project sponsor and upper management will continue to be necessary to expedite Y2K program progress at W3. The licensee agreed with this observation and has committed to provide more aggressive management oversight of the Y2K project.
3. The licensee began the formal W3 Y2K readiness program in June 1997, and finished the plant inventory and initial assessment phase in May 1998. The detailed assessment phase for systems and components that are mission critical is scheduled to be completed by December 31, 1998. Confirmatory testing of mission critical systems for Y2K readiness is conducted by the licensee at the plant site. Remediation of mission critical systems has begun. No Y2K problems have been identified in safety-related systems to date.

   The Entergy Global Year 2000 policy requires that all Mission Critical asset work projects be completed by December 31, 1998, and the work projects for Important assets be completed by June 30, 1999. However, the audit team noted that, of the 8 Mission Critical application software items, 4 will be completed in April 1999, and of the 275 Mission Critical embedded items in 25 work projects, 8 work projects are scheduled for completion by June 1999. Thus, the initially established deadline for the Mission Critical assets will not be met at W3, and may impact the deadline for completing the Important asset work projects. Additionally, there does not appear to be sufficient flexibility in the schedules to account for unforseen delays in completing the work projects.

   To address the above schedule conflict, the licensee established a revised schedule for Y2K readiness of mission critical and important system projects by June 30, 1999. The audit team believes that, with the additional resources the licensee plans to obtain in the immediate future, the above Y2K readiness schedule appears to be achievable. This conclusion is based on the expertise and experience of the present W3 Y2K project team members, support from management, and support available via information sharing and interactions with EPRI, other licensees, the Combustion Engineering Owners Group (CEOG), plant vendors, the Southeast Electricity Reliability Council, and the North American Electric Reliability Council.
4. The licensee has just started Y2K contingency planning, and is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort. The W3 contingency plan is scheduled for completion on June 30, 1999. The W3 plan will be incorporated into the EOI plan format with a single corporate plan for Y2K contingencies and site-specific plans for each facility connected to the EOI grid. EOI will be providing the milestones for identifying the risks, analyzing the risks, and creating the plans. At present, the licensee has assigned one person part-time as lead for W3 Y2K contingency planning with support from two Y2K project team members. The audit team considers that the schedule for completion of detailed contingency planning may be adversely impacted by the refueling outage activities and other Y2K readiness activities. The audit team believes that additional resources are needed to support W3 Y2K contingency planning activities in order to meet the established W3 Y2K project schedules. The licensee has committed to provide additional resources on contingency planning in order to meet the above schedule.
5. An independent assessment of the W3 Y2K project plan was performed by the licensee on October 19-21, 1998. Recommendations from that assessment are being addressed by the W3 Y2K project team in subsequent revisions of the W3 Y2K project plan. The audit team reviewed the W3 Y2K Project team draft response to the recommendations of the assessment report and believes the proposed corrective actions should address the recommendations adequately.
6. The Y2K project documentation system used at W3 is well-organized. Related applications and embedded systems are combined into work project documentation packages. The documentation is maintained in an electronic database. Documents not produced on the system are scanned into the database. The database is backed-up on a weekly basis. Upon completion of the project, the documentation is printed and inserted into a hard-copy file, with a summary of the activities that were performed. The documentation in the completed work project includes a summary of the work performed and permits a rapid review of the Y2K activities status and conclusions for each project.

Tables and Attachments

Table 1 - W3 Y2K Project Implementation Schedule

Activity	Starting Date	Finishing Date
Developed Inventory	6/97	5/98
Classified and Prioritized Inventory	late 1997	5/98
Detailed Assessment of Mission Critical Assets	early 1998	12/31/98
Readiness Certification of Mission Critical and Important Assets	mid 1998	6/30/99
Contingency Planning	late 1998	6/30/99

Table 2 - W3 Software Applications Reviewed by the Audit Team

Project ID	Package ID	Application	Crit. Rank	Completed Remediation
WP020	WF3-0096	TRANSACT Code	I	
WP027	WF3-0193	Voice Notification System	I	
WP043	WF3-0031	Risk Management Query System	I	
WP006	WF3-0006	C. R. Trending	I	
W*CORP	WF3-2237	Licensing Research System "NEW"	M	
WP003	WF3-0084	Maintenance Rule System Structures and Components	M	
WP004	WF3-0205	TSC/EOF Dose Assessment Program	M	11/02/98
W*NUC	WF3-0128	Bechtel Pipe Stress SW (46000007)	M	
WP049	WF3-2240	10CFR50.59 Database	M	
WP048	WF3-2239	FSAR/LDCR Change Log	M	
WP047	WF3-2238	Licensing Research System "OLD"	M	
W*CORP	WF3-0194	Work Management System	M	
W*CORP	WF3-0195	Station Information Management System	M	
W*NUC	WF3-0002	Project View	M	
WP026	WF3-0048	A-Fault; version 3.5, Level 2.1	M	
WP004	WF3-0206	Control Room Dose Assessment Program	M	11/02/98
WP026	WF3-0050	DAPPER; version 3.5, Level 2.1	M	

I - Important
M - Mission Critical

Table 3 - W3 Embedded Systems and Components Reviewed by the Audit Team

Project ID	Package ID	Embedded System/Component	Crit. Rank	Completed Remediation
WP151	WF3-0388	Switchyard Controls	I	
WP163	WF3-0320	TLD Equipment & Software /ERIMS - Effluents System	I	
WP163	WF3-0321	TLD Equipment & Software ERIMS/ MET Data	I	
WP131	WF3-0934		I	

WP159	WF3-1073	CE NSSS Transient Simulator (CENTS)	I	
WP131	WF3-0935		I	
WP145	WF3-0309	Rosemount Transmitters	I	
WP100	WF3-0382	Site Security	M	
WP100	WF3-0774		M	
WP101	WF3-0625	Radiation Monitoring System	M	
WP101	WF3-0644		M	
WP101	WF3-0645		M	
WP101	WF3-0646		M	
WP101	WF3-0678		M	
WP101	WF3-0686		M	
WP101	WF3-0688		M	
WP101	WF3-0689		M	
WP101	WF3-0702		M	
WP101	WF3-0709		M	
WP101	WF3-0728		M	
WP101	WF3-0730		M	
WP102	WF3-0404	Distributed G2-40 Multiplexer (quantity 7)	M	
WP102	WF3-0416	OpenVMS 6.1	M	
WP102	WF3-0423	DECSet (VaxSet)	M	
WP102	WF3-0810	Plant Monitoring Computer	M	
WP103	WF3-0567	MXL Custom Software Generator, Ver 5.08 (CSG-M)	M	09/23/98
WP103	WF3-0793	Fire Detection/Control Room - Main Control Panel	M	09/23/98
WP103	WF3-0800	Fire Detection Main Control Panel - MSB	M	09/23/98
WP105	WF3-0951	Valve & Loose Parts Monitoring	M	
WP108	WF3-2195	Temperature Monitoring Panel	M	09/21/98
WP112	WF3-0116	Core Element Assembly Position Display System	M	11/19/98
WP112	WF3-2232	Addressable Constants Loader Disk	M	11/19/98
WP113	WF3-0870	ACTM Cards	M	11/13/98
WP114	WF3-2244	VOTES Test Set, Version 2.5	M	
WP115	WF3-0600	Recorders	M	
WP118	WF3-0350	Terry-Turbine speed control	M	09/04/98
WP120	WF3-0356	FWPT controls	M	
WP120	WF3-0358	FW Flow Transmitters	M	
WP135	WF3-0386	Plant Monitors (Various)	M	10/08/98
WP162	WF3-0346	COLSS	M	
I - Important M - Mission Critical				

Attachment 1

Waterford 3 Y2K Audit Plan Outline

A. Project organization
B. Project Manager -
C. Project Sponsor -

1. Participation in Owners Group, Group activities related to the Y2K effort, (EPRI, NEI).
   Peer review efforts.
2. Corporate activities
3. Schedule of activities for Y2K readiness

Activity	Starting Date	Finishing Date
Communication/ Awareness		
Project Plan		
Inventory		
Detailed analysis/testing		
Remediation		
Validation/testing		
Contingency Planning		

4. Inventory
   (Review the Information Database.)

Classification:

5. Analysis -
   Number of items identified as Y2K compliant. Review how this was determined - Vendor data; any additional testing.
   Number of items not Y2K compliant -

Accept As Is: (Review how this was determined. ___ require validation testing. Check vendor data, Owners Group data, any testing by vendor?)

a) Vendor evaluation - validation testing based on criticality of item, prior experience with vendor, extent of documentation, or plant knowledge of the item
b) Plant owned or supported software (including tools) evaluation - knowledge based decisions, scanning, testing. When testing proposed, need test specifications and procedures.
c) Interface evaluation - Part of corporate plan (?) Grid, substation, communication,
d) Embedded components evaluation - knowledge based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. (Review the documents when this is the case.)

6. Remediation - Use of existing software procedures (?). Verify long term commitments for maintaining Y2K readiness.
7. Y2K Testing and Validation
   - Assessment testing - Per Computer problem/change reports (PCRs) and associated V&V plans and test procedures.
   - Testing subsequent to remediation - unit testing; integration testing; system testing.
8. Regulatory Considerations - 10 CFR 50.59 reviews; reportability evaluations per 10 CFR 50.72, 50.73 and part 21; operability determinations.
9. Contingency Planning - NEI/NUSMG 98-07
   Internal Risks
   External Risks
   Remediation Risks (Vendor support, resource limitations, etc.)
10. Y2K Management Plan-
   Tracking against milestones of the project. Management awareness. Status reporting
   External resources
   Use of existing procedures for software QA, configuration management, V&V.,
   Documentation
   Audits (any audits done/reports issued).

Attachment 2

Documents Reviewed

1. W3 Y2K Project Team (Roster of Participants)
2. "Year 2000 Project Guide," Y2K-001, Rev. 3, dated November 23, 1998
3. "Year 2000 Project," Procedure No. W2.115, Rev. 0, dated August 26, 1998.

4. Newsletter and associated W3 communications
5. Application and Embedded Systems Asset Index
6. W3 Y2K Audit Entrance Meeting Slide Handouts

Attachment 3

Entrance Meeting - Attendees
December 14, 1998

Randy Douett	Maintenance Manager/EOI
Early C. Ewing	Dir, Nuclear Safety and Regulatory Affairs
Greg Pierce	Director, Quality/EOI/W3
Theodore Leonard	General Manager, Plant Operations
Craig Zeringue	Project Coordinator/Project Management
Marie Bishop	EOI Y2K Project Manager
Fugate Chester	Operations Support/EOI
Jay O'Hearn	Dir, Training & Emergency Preparedness
Andre Dejdie	Supervisor, IT
Mike Brandon	Lic. Sup./Licensing
Paul Gropp	Manager DE/EIC
Tom Farnholtz	NRC-SRI W3
David A. Young	Lic. Eng./Licensing
Dean Hertzog	IT Consultant/ESI-Office of Year 2000
Chuck Bryan	Y2K Team, W3
Margit Triggs	Y2K PM, W3
Maurice Rieffel	Office of the Year 2000
Raymond Burski	Director, Site Support
Odie Tucker	Y2K Embedded Lead, Project Management
Chuck Dugger	Vice President, Operations, W3
Mike Waterman	NRC
Matt Chiramal	NRC
A.J. Wrape	Director/Design Engineering

March 24, 1999

Mr. J. P. O'Hanlon
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: NRC GENERIC LETTER NO. 98-01 - YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS - NORTH ANNA POWER STATION, UNIT 1 AND UNIT 2 (TAC NOS. MA1861 AND MA1862)

Dear Mr. O'Hanlon:

The US NRC issued Generic Letter (GL) 98-01 to require that all holders of operating licenses for nuclear power plants provide the following information regarding their programs, planned or implemented, to address the year 2000 (Y2K) problem in computer systems at their facilities: (1) written confirmation of implementation of the programs; and (2) written certification that the facilities are Y2K ready with regard to compliance with the terms and conditions of their licenses and NRC regulations.

In August 1998, it was decided that the staff from the Instrumentations and Control Branch, Office of Nuclear Reactor Regulation, would conduct audits of the licensee's plant-specific Y2K readiness program implementation. The purpose of the audit was to gather information on licensee Y2K programs and use the results to determine the need for additional action beyond that already taken. Twelve plants were chosen for the initial audit, and the North Anna Power Station (NAPS) was one of the three chosen from Region 2.

The audit of NAPS took place on January 26, 27, and 28, 1999, at your offices in Glen Allen, Virginia. The audit team's assessment of your Y2K project plan has identified that the plan is well-structured, well organized, and well implemented. The self-assessments were worthwhile and informative. The project is on schedule, and will be completed by July 1999, with the primary exception of items that can be remediated only during an outage.

We thank you for the cooperation and assistance provided to the auditors.

A copy of the audit report is enclosed. Please be advised that the report will also be posted to the web site.

Sincerely,

ORIGINAL SIGNED BY:

N. Kalyanam, Project Manager
Project Directorate II-2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosure: As stated

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION (NRR)

AUDIT REPORT

ON

IMPLEMENTATION OF GENERIC LETTER (GL) 98-01

"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-338, 50-339
Operating License:	OL-FP
License No:	NPF-4, NPF-7
Licensee:	Virginia Electric and Power Company (VEPCO)
Facility:	North Anna Nuclear Generating Station Units 1 and 2
Location:	VEPCO Innsbrook Training Center Glen Allen, Virginia
Dates:	January 26, 1999 - January 28, 1999
Audit Team Members:	D. Spaulding E. Lee P. Fillion
Approved by:	Jerry Mauck, Acting Branch Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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Executive Summary

From January 26 through January 28, 1999, the NRC staff conducted an audit of the Year 2000 (Y2K) program at the North Anna Nuclear Generating Station in accordance with the established audit plan (http://www.nrc.gov/NRC/Y2K/y2kaudit.html). The purpose of the audit was to (1) assess the effectiveness of the Virginia Electric Power Company program for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding North Anna's Nuclear Business Unit Year 2000 Project plan (Y2K Plan) and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the audit team's assessment and evaluation of the North Anna Nuclear Generating Station Year 2000 Project plan, the following findings were made:

- The North Anna Year 2000 Project plan is considered to be a well-structured, well organized, and well implemented program. The strong senior management support for the Y2K readiness effort was clearly evident.
- Early on, the importance of the continuity of nuclear plant operations was recognized, and the necessary resources were committed to the readiness effort.
- The licensee's self-assessments were worthwhile and informative. Many of the observations that the NRC audit team broached for discussion with the licensee had already been pinpointed in their self assessments.
- The licensees contingency planning is in accordance with the recommendations made in NEI/NUSMG 98-07.
- The North Anna Year 2000 Project is on schedule, and will be completed by July 1999, with the primary exception of items that can only be remediated during an outage. The North Anna project is in the phases of detailed assessment, remediation, and contingency planning.
- North Anna was involved early on in addressing the Y2K issue and continues participation in organizations which were instrumental in early definition and addressing the Y2K problem at nuclear plants.

1.0 Introduction

The objectives of the North Anna Nuclear Generating Station Y2K Program Audit were to:

- Assess the effectiveness of the Virginia Electric Power Company (the licensee) program for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to the potential Y2K problems.
- Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999.
- Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan (<<http://www.nrc.gov/NRC/Y2K/y2kaudit.html>>) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL-98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

At the beginning of the audit, the licensee provided a copy of the updated version of their Y2K readiness plan, "Nuclear Business Unit Year 2000 Project," (listed in Attachment 1). The readiness plan consists of several "volumes" titled: (1) "Project Management Plan," (2) "Project Manual," (3) "Contingency Planning," (4) "Reference Material," and (5) "Management Awareness Manual."

The audit process began with an entrance meeting attended by the North Anna Y2K Sponsor, Y2K Project Manager, corporate and plant personnel, and members of the NRC audit team. Attachment 2 is a list of the attendees. Members of the North Anna Y2K organization described the project organization, the project plan, implementation, and the current status.

After the entrance meeting, the audit team reviewed the North Anna readiness plan, associated project documentation, and communicated with the North Anna personnel on an on-going basis to resolve issues and answer questions as they arose. The documents reviewed are listed in Attachment 1.

2.0 Project Description

2.1 Project Organization

The North Anna Year 2000 Project organization is comprised of the following personnel: (1) the Senior Vice President-Nuclear, who acts as the Executive Sponsor, (2) the Nuclear Information Technology (NIT) Manager, who acts as the Project Sponsor, (3) the Nuclear Business Unit Year 2000 Project Manager, who has overall authority and responsibility for Y2K project activities, and reports directly to

the Project Sponsor, (4) the Project Lead for the Business Applications and Software Team, (5) the Project Lead for the Permanent Plant Equipment Team, and (6) the Project Lead for the Plant Support Team which includes Supply Management. Additional support and resources are obtained through the Director of Design Engineering, the Manager of Nuclear Materials and personnel from Nuclear Licensing and Operations Support.

North Anna interfaces with industry organizations and engages in benchmarking in addressing the year 2000 problem. Benchmarking is a peer review process that the licensee has participated in with Phillip Morris, USA, and Japan Atomic Power Company.

North Anna interfaces with the following industry groups: the Nuclear Utility Software Management Group (NUSMG), the Westinghouse Owners Group (WOG), The Electric Power Research Institute (EPRI), the Nuclear Energy Institute (NEI) and the North American Electric Reliability Council (NERC). Furthermore, North Anna is involved with the CDSV nuclear exchange program. The CDSV is the acronym formed from the names of the participants; Carolina Power and Light, Duke Energy, and South Carolina Electric and Gas, and Virginia Power. The CDSV uses a team approach to address the year 2000 problem by drawing on collective skills and resources. The CDSV endorsed a Year 2000 Focus Team in July 1997. The Year 2000 Focus Team has three primary objectives: (1) minimize the economic impact of the Year 2000 issue on nuclear operations, (2) establish regulatory confidence in the adequacy of Year 2000 actions, and (3) strengthen individual utility Year 2000 efforts through collaboration and peer review.

2.2 Project Plan

The licensee's Y2K readiness plan, "Nuclear Business Unit Year 2000 Project," consists of several "volumes" titled: (1) "Project Management Plan," (2) "Project Manual," (3) "Contingency Planning," (4) "Reference Material," and (5) "Management Awareness Manual."

The objectives of the North Anna Y2K Project include but are not limited to the following: (1) demonstrate with reasonable assurance that the Year 2000 event will not adversely impact the design basis functions of the nuclear station structures, systems, or components; (2) identify and effectively manage project, regulatory, legal, and financial risks applicable to plant operation and project execution; and (3) assure that the Year 2000 activities of other strategic business units that affect nuclear business unit nuclear facility operation are fully identified and monitored to completion.

The scope of the licensee's readiness program encompasses items that are defined as, business applications and software, permanent plant equipment, and plant support and supply management. Business applications and software encompasses such items as commercial off the shelf software used on the local area network servers, or stand alone workstations. Plant support equipment encompasses such items as non-permanent plant equipment and associated software such as portable test equipment, training simulators including associated computer hardware and software and operating systems, corporate emergency response facility, and suppliers and vendors that provide products or services. Permanent plant equipment, encompasses permanently installed instrumentation and control devices or systems, process and effluent radiation monitors, plant process computer, and plant communication systems, including telephone systems and paging equipment. Embedded components are encompassed within permanent plant equipment.

The major tasks defined in their readiness program include awareness, initial assessment (initial planning, inventory development, impact screening and classification) detailed assessment (compliance assessment, readiness assessment), remediation and contingency planning.

The audit team found that the North Anna Millennium Project Plan encompasses the guidance in the NEI/NUSMG 97-07, although some differences in activity names/terms exist.

2.2.1 Awareness

Awareness of the Year 2000 program began informally in 1996. Awareness activities began with middle management discussing the need to address the Y2K issue with senior management at various meetings. Within North Anna's nuclear business unit (NBU), Y2K has been addressed via the NBU Year 2000 intranet site, technical staff training, and Year 2000 awareness posters. Additionally, articles in the site-wide newsletter addressing the Y2K problem have been made available to all personnel.

In 1997, the licensee began participating with other industry groups in meetings and seminars addressing the Year 2000 issue. The licensee participates and interfaces with industry groups such as the Nuclear Utility Software Management Group (NUSMG), Nuclear Energy Institute (NEI), and Electric Power Research Institute (EPRI).

The North Anna Y2K Readiness schedule is provided in Table 1.

2.2.2 Initial Assessment

At North Anna, initial assessment included the activities of inventory development, impact screening, and criticality determination.

Specifically in the case of business applications and software, and in the case of plant support equipment, the inventory development is accomplished through user input and subject matter expert interviews. In the case of permanent plant equipment, the inventory development is accomplished through equipment data system search, plant walk-downs, and subject matter expert interviews.

Impact screening is performed to confirm whether the interims identified in the inventory have characteristics that are susceptible to the Y2K problem. Items are verified by one or combination of the following: walk-down, review of associated drawings, vendor manuals, other relevant documentation. Firmware and software associated with permanent plant equipment are assumed suspect until confirmed to be Y2K compliant or ready by performing an evaluation, testing, modification, or replacement.

Inventory development is performed to identify all potentially affected items (business applications and software, permanent plant equipment, and plant support equipment).

The inventory and assessment of items are depicted in Table 2 of this report.

The permanent plant equipment that might be impacted by Y2K were identified by querying the equipment database. The query was performed using predetermined component codes. The query resulted in the identification of 15,600 permanent plant equipment items. The licensee also identified permanent plant equipment items by performing system walk-downs and by interviewing subject matter experts. Subsequent to the walk-downs and interviews, 605 permanent plant equipment items were identified. The licensee indicated that the identification of these 605 permanent plant equipment items

served to validate the effectiveness of their query of the equipment database. This was due to the fact that the 605 permanent plant equipment items identified, had already been identified from the equipment database query.

Impact screening confirmed whether the items identified had characteristics that were susceptible to Y2K. To facilitate North Anna management in appropriately assigning resources to address readiness activities, the inventoried permanent plant equipment items were grouped based on the item's probability of being impacted by Y2K events. Specifically in the area of permanent plant equipment, all items were assigned to one of three groups based on the following criteria:

Group 1	Items with a high probability of being impacted by the Year 2000 event derived from subject matter, expert interviews and field walk-downs.
Group 2	Items not classified as Group 1 that were associated with PSA risk-significant systems (e.g., feed water, safety injection, etc.).
Group 3	Items not classified as Group 1 or 2 and expected, based on engineering judgment to have little or no probability of being impacted.

The impact screening on the remaining Group 3 items is scheduled to be completed by April 30, 1999. The licensee feels that the Group 3 items are not likely be impacted by Y2K. This belief is supported by the licensee's results of the impact screening performed on the selected Group 3 items.

Criticality determination consisted of determining whether an item was mission critical, important, or non-essential. The criticality determination was accomplished using any one or combination of the following: ranking criteria, failure risk, item classification and expert panel. Specifically in the area of permanent plant equipment, the licensee established an expert panel to prioritize the 605 permanent plant equipment items. The expert panel was chaired by the Y2K project team lead. The areas of expertise that were represented included; Project Engineering, Nuclear Operation, Station Licensing, Station Planning, Station Chemistry, Health Physics, System Engineering, Station Maintenance, and Control Operations.

Each identified item is designated as "mission critical," "important," or "non-essential," based on the following criteria:

Mission Critical:

Components, systems, or groups of similar devices that, in the event of failure, degradation, or other adverse impact due to Y2K, would significantly challenge the ability of the nuclear business unit to:

- Operate in a safe manner (including nuclear and industrial safety considerations),
- Provide service to customers (electrical distribution),
- Generate revenue (power generation) or control costs, or
- Avoid adverse regulatory or legal exposure

Important:

Components, systems, or groups of similar devices that, in the event of failure, degradation, or other adverse impact, would:

- Present unanticipated challenges to plant operators,
- Cause the NBU to incur remedy or recovery costs >$100,000 but <$1,000,000,

- Adversely impact compliance with regulatory requirements or commitments

Non-Essential:

Components or systems that provide a useful function but are not classified as either mission-critical or important.

The table below shows the results of the expert panel's review of the permanent plant equipment.

Priority	# of Items
Mission Critical	103
Important	411
Non-Essential	93

The licensee was aware of the fact that several of the 605 identified items were actually identical to each other. Thus, several items were the same based on such factors as manufacturer/model attributes. The effect of this duplication is realized in the following table.

Priority	# of groups/# items
Mission Critical	16 / 103
Important	49 / 411
Non-Essential	25 / 93
Total	90 / 605

The licensee used the term "readiness assessment" to describe the process of prioritizing the items (based on their importance or criticality to related business processes, the operation of the facility, and their inherent functional characteristics). For each group of items, a "Readiness Assessment Report" was generated.

As of January 26, 1999, the licensee had completed readiness assessments on 562 of the 605 permanent plant equipment items.

The NRC audit team selected 24 group item folders to review. From the audit team review of 24 group items, it was found that in a few instances, the licensee made a decision to refer to a group item as "Y2K ready" even though the group item could be designated as; "Y2K compliant," "Y2K ready," or "no-impact. Through discussion held on this matter, the licensee indicated that their self assessment process had already identified this term usage and that they are in the process of addressing this (for example, reviewing the readiness reports).

2.2.3 Detailed Assessment

At North Anna, the detailed assessment phase assess impacted items to determine their Year 2000 compliance status. A variety of assessment methods may be necessary depending on the nature of the item. Detailed assessments are performed using evaluation techniques such as physical inspection, document review, user inquiry, or scanning tools. Additionally, vendor certification review and/or assessment testing may be used. Specifically in the area of embedded components, a primary tool for

determining chip-type and characteristics is the integrated circuit master manual and vendor web sites. The licensee used a detailed process for evaluated their embedded systems which is illustrated in their embedded system evaluation process flow chart. Their embedded systems are addressed as part of the items reviewed by the permanent plant equipment team.

The audit team reviewed a sample of detailed assessment packages for items designated as "important." The detailed assessments owned by the Permanent Plant Equipment Team which were reviewed were: Halon System, Sequence of events recorder, Fire Management System, Station Security System (which included eight subsystems), and Chemistry lab equipment. Discussions were held with licensee staff who compiled the detailed evaluation packages for the Halon System, Station Security System and chemistry lab equipment

The NRC Audit Team found that the detailed evaluations were performed in accordance with the guidance provided by the NEI/NUSMG 97-07 document, Attachment E. The equipment instruction manuals were reviewed, equipment manufacturers were sent letters requesting their statement concerning Y2K compliance of the equipment they furnished, and the manufacturers' responses were included in the detailed evaluation packages. The licensee confirmed that model numbers and other codes and designators matched the documentation that was provided.

Testing was performed when it was deemed necessary to verify the evaluation conclusions. The sequence of events recorder, Station Security System and chemistry lab equipment were tested. The licensee's overall conclusion and basis for their conclusion were clearly stated in the packages. The Audit Team found that the engineers demonstrated that they are knowledgeable in the area of digital systems in general, and in particular, the details of the equipment they reviewed.

The licensee indicated that the assessment packages received an independent review.

Early in the North Anna Y2K readiness program, some initial assessments packages actually contained detailed evaluations. Examples of this would be the assessment for the Reactor Protection System and the Feedwater System. This assessment was reviewed by the Audit Team, and found to be equal in documentation quality and technical quality to the detailed evaluation packages.

In cases where the detailed evaluation packages concluded that remedial action was necessary, the Audit Team confirmed that the action items were being tracked in the manner specified in the licensee's program.

The Audit Team found that one detailed evaluation package prepared by the Plant Support Team, for the check valve diagnostic equipment, did not have the same elements/characteristics which were found in the packages prepared by the Permanent Plant Equipment Team. For example, the initial conclusion was that this equipment was compliant based on the manufacturer's response letter without onsite testing. Later, the manufacturer sent a letter stating the equipment was not compliant. The Audit Team learned that the licensee had previously conducted a self assessment of their Y2K readiness program and had already concluded that evaluations performed by the Plant Support Team would be reviewed. The licensee indicated that where necessary, additional testing and evaluations performed and additional documentation obtained so that those evaluation packages will have the same elements/characteristics as the packages prepared by the Permanent Plant Equipment Team.

Table 2 provides the inventory and assessment of identified items.

2.2.4 Y2K Testing and Validation

Susceptibility testing was performed during detailed assessments. These tests were performed using procedures developed in accordance with the established guidelines for Y2K testing of permanent plant equipment. This Y2K test guideline provides specific guidance to Y2K team members on: conducting test planning, preparing the test procedures, obtaining and ensuring approval of test procedures, and carrying-out and performing the procedures.

The audit team reviewed the licensee's test reports as part of the readiness assessment. It was observed that not all of the Y2K test-dates, as identified in the guideline, were used when some of the permanent equipment was tested, during the "infant stages" of the licensees Y2K program. During discussion, the licensee indicated that their internal audit already identified this issue, and that they are in the process of addressing this issue.

2.2.5 Remediation

The purpose of remediation is to replace, fix, or eliminate items identified in the assessment. At North Anna, non-compliant items are remediated as required to achieve a compliant or ready status. Post remediation testing is performed to confirm that remedies are effective.

Any changes to systems/components during remediation will follow North Anna's existing change process and quality assurance control guidelines. The existing change process includes the requirement to specify new spare parts that will be required for the installation, testing, start-up and maintenance of the new equipment and to identify and remove obsolete spare parts.

Of the 55 permanent plant equipment items that need remediation at North Anna, there are two items that are scheduled to be remediated during the Fall outage. The licensee indicated that they were exploring the possibility of performing remediation on these outage dependent items at an earlier time. The two permanent plant equipment items, are the Unit 2 High Capacity Steam Generator Blowdown Control System, and Radiation Monitors. Currently, the remediation completion date for these two items is October 29, 1999.

2.2.6. Regulatory Considerations

North Anna makes use of existing programs and policies in addressing the year 2000 problem. 10CFR50.59 reviews, plant modifications and design changes, software quality assurance, and corrective actions, each have procedures that were already established. Guidelines have been developed as needed, to supplement existing procedures to provide specific direction. Testing and remediation activities are performed in accordance with approved procedures. The appropriate change control mechanism is used for the type of remediation required.

2.2.7 Contingency Planning

North Anna's contingency planning covers the aspects of internal facility risks and external interface risks, and remediation risks. A contingency planning oversight team exists and is comprised of the vice president of nuclear operations, and key project personnel and management personnel. The contingency planning oversight team is responsible for determining associated risks, identifying individual

contingency plan needs, and assigning the contingency plan preparation to the appropriate group. An integrated contingency plan will be developed from and comprised of individual contingency plans. Individual contingency plans are prepared for items, systems, or events which have been determined to present a significant risk.

An aspect of North Anna's contingency planning is to minimize its dependency on critical consumable usage and inventory items which are provided by external suppliers. The licensee is determining which items need an alternate supply sources and /or increased inventory.

The NRC audit team found that the licensee's contingency plan is in accordance with the recommendations of the NEI/NUSMG 98-07.

2.2.8. Y2K Program Management

The management plan establishes, organizes, manages, and integrates the diversity of activities required to address Y2K readiness. The Y2K readiness activities are covered in the three management areas of risk management, contingency planning, and project internal controls. Methods of oversight of the project include management reviews, self assessments and internal and external audits.

Several mechanisms are used to communicate the status of Y2K readiness; a Year 2000 Compliance Report, a Project Task Schedule Update, and a Performance Indicator Status, produced monthly; Nuclear Business Unit Updates produced on a quarterly basis, and Manager - Nuclear Information Technology Updates, produced on a bi-weekly basis. Additional management updates use the existing meeting forums; management review board meetings and management safety review committee meetings.

2.2.9 Electrical Grid Issues

The licensee coordinated their discussion of grid issues with a presentation of their system operations station. Additionally, discussions were held with the managers responsible for the Transmission System and Distribution System (T&D) Y2K readiness programs. Through discussion, it was indicated that the T&D Y2K readiness program is similar to the Y2K readiness program for the nuclear plant. Furthermore, it was indicated that the readiness program, implementation of remedial actions, development of contingency planning as well as precautionary planning, are on schedule.

The licensee includes electric grid issues in its consideration of external events in their contingency planning. Events such as loss of offsite power and load/demand fluctuations are being taken into consideration.

3.0 Audit Team Observations

- The North Anna Year 2000 Project Plan is based on the guidance of NEI/NUSMG 97-07 and NRC Generic Letter 98-01. Based on the review and evaluation by the audit team of the plan and its implementation, the North Anna Year 2000 Project plan is considered to be a well-structured, well organized, and well implemented program. The strong senior management support for the Y2K readiness effort was clearly evident and demonstrated.
- The high level of dedication and expertise of the Y2K project team and staff, and the commitment of resources by senior management were apparent. Early on, the importance of the continuity of

nuclear plant operations was recognized, and the necessary resources were committed to the readiness effort. The licensee was aware of the types of situations that could have occurred had they not implemented a readiness program. Personnel indicated examples such as; operators would have to take samples manually because the chemistry lab would not operate, the Heating, Ventilating and Air Conditioning System at the backup emergency response center/transmissions operations center would not operate, the Supervisory Control and Data Acquisition (SCADA) System on the Distribution System would not function.

- The licensee's self-assessments were meaningful and informative. North Anna had previously incorporated recommendations made into their readiness program in an effective manner. Several of the issues which the licensee's self- assessment identified were a reflection of tasks completed during the infancy stages of their Readiness program. Several tasks/activities had been completed prior to the issuance of guidance documents and information from industry and the NRC. The issues that the NRC audit team broached for discussion with the licensee had been pinpointed in their self assessments.
- The licensee's contingency planning is in accordance with the recommendations made in NEI/NUSMG 98-07. There is one individual who is assigned as the single point of contact for the contingency planning process. In keeping with the NEI/NUSMG recommendations, their contingency planning process continues throughout the Y2K readiness program.
- The North Anna Year 2000 Project is on schedule, and will be completed by July 1999, with the primary exception of items that can only be remediated during an outage. The outage related remediation will be completed in October 1999. The North Anna project is in the phases of detailed assessment, remediation, and contingency planning.
- North Anna has been involved in information sharing with their peer utilities and industry groups. North Anna was involved early on in addressing the Y2K issue and continues participation in organizations which were instrumental in early definition and addressing the Y2K problem at nuclear plants.

Tables and Attachments

Table 1 -North Anna Year 2000 Readiness Schedule		
Activity	**Starting Date**	**Finishing Date**
Awareness	1996	Ongoing
Initial Assessment	April 1997	December 1997
Inventory Development		
Impact Screening	September 1997	April 1998
Readiness Assessment	February 1998	January 1999
Detailed Assessment	March 1999	
Remediation*	March 1998	October 1999
Contingency Planning		
Contingency Plan Development	April 1998	June 1999
Contingency Plan Implementation	July 1999	December 1999

*critical non-outage items will be remediated by June 30, 1999, critical outage items will be remediated by October 29, 1999

Table 2 - Inventory and Assessment				
	Critical	**Important**	**Non-Essential**	**Total**
Business Applications and Software				
Total Items	192	216	588	996
Readiness Assessment in Process	26	64	588	678
Assessment Report/Retire/No-Impact	92	100	0	192
Remediation Required	64	41	0	105
Remediation Complete	36	22	0	58
Y2K Ready	10	11	0	21
% Complete*	53%	51%	0%	21%
% Complete (Excluding Non-essential items)				52%
Permanent Plant Equipment				
Total Items	103	411	91	605
Readiness Assessment In Process	0	29	42	71
Remediation Required	0	23	5	28
Remediation Complete	0	6	0	6
Y2K Ready	103	365	44	512
%Complete	100%	89%	48%	85%
%Complete (Excluding Non-Essential Items)				91%
Plant Support				
Total Items	70	325	0	395
Readiness Assessment in Process	70	137	0	207
Remediation Required	0	84	0	84
Remediation Complete	0	30	0	30
Y2K Ready	0	104	0	104
%Complete	0%	32%	0%	26%
%Complete (Excluding Non-Essential Items)				26%

Table 3 - Permanent Plant Equipment			
System/Device Group	**Priority**	**Readiness Assessment**	**Y2K Readiness**
AMSAC (Modicon 884 PLCs)	Mission Critical	Completed	Ready
Charging System Flow Transmitters (Foxboro E96P-1A)	Mission Critical	Impact Screening only	No-Impact

Electro-Hydraulic Control System Cards	Mission Critical	Completed	Ready
Generator Negative Sequence Relays (GE 12SGC21B)	Mission Critical	Impact Screening only	No-Impact
Generator Over excitation Relays (Beck with M0299)	Mission Critical	Completed	Ready
Generator Sequential Tripping Relays (Basler BE1-32R)	Mission Critical	Completed	Ready
Inadequate Core Cooling (Westinghouse ICCM-86)	Mission Critical	Completed	Ready
L&N Recorders- Impacted	Mission Critical	Completed	Ready
L&N Recorders - Non-lmpacted	Mission Critical	Impact Screening only	No-Impact
Radiation Monitors - Nib (MGP)	Mission Critical	Completed	Ready
Radiation Monitors (Kaman)	Mission Critical	Completed	Ready
Radiation Monitors (NRC)	Mission Critical	Completed	Ready
System/Device Group	**Priority**	**Readiness Assessment**	**Y2K Readiness**
Station Blackout Control System (GE-Fanuc 90-30 PLC)	Mission Critical	Completed	Ready
Station Blackout Protective Relays (Baster BE1-51/27R)	Mission Critical	Completed	Ready
Station Blackout Transmitters (Rosemount 2088) u	Mission Critical	Completed	Ready
Validyne Sub-System (ICCM)	Mission Critical	Completed	Ready
High Capacity SG Blowdown Control System - Unit 1 (Intercolor/ABB)	Important	Completed after Remediation	Ready
High Capacity SG Blowdown Control System - Unit 2 (Intercolor/ABB)	Important	Requires Remediation	Fall Outage
Nuclear Instrumentation (Gamma-Metrics)	Important	Impact Screening only	No-Impact
L&N Recorders - Non-lmpacted	Important	Impact Screening only	No-Impact
High Capacity SG Blowdown Valve Controllers (Fisher DVC-5010)	Important	Completed	Ready
High Capacity SG Blowdown Transmitter (Kent-Tylor)	Important	Completed	Ready
EDG Monitoring and Analysis System (IDX)	Non-Essential	Not Completed	To Be Determined
Radiation Monitors - Service Water (Victoreen)	Non-Essential	Completed	Compliant

Attachment 1

Documents Reviewed

Virginia Power Nuclear Business Unit Year 2000 Project Plan, dated January 25, 1999, consisting of:

- Project Management Plan
- Reference Materials Manual
- Contingency Planning Manual
- Management Awareness Manual
- Project Manual
- Selected assessment and remediation folders.

Attachment 2

Attendance List

NRC Year 2000 Audit Entrance Meeting

January 26, 1999

Paul Fillion	USNRC RIII
Deirdre Spaulding	USNRC HICB
Eric Lee	USNRC HICB
Vincent West	VA Power
David Simmers	VA Power
Page Kemp	VA Power
Billy Warf	VA Power
John Connally	VA Power
Hami Paras	VA Power
David Christian	VA Power
Melanie Matthews	VA Power
Gerald Pedersen	VA Power
Melissa Brown	VA Power
Marc Gaudette	VA Power

January 28, 1999

Marc Gaudette	VA Power
W. S. Miser	VA Power
Vincent West	VA Power
L. McDermid	VA Power
Jerry M. Williams	VA Power
L. N. Hartz	VA Power

Melissa Brown	VA Power
J. H. McCarthy	VA Power
A. W. Farmer	VA Power
Gerald Pedersen	VA Power
Billy Warf	VA Power
Bruce Leonard	VA Power
Eric Lee	USNRC HICB
Deidre Spaulding	USNRC HICB
Paul Fillion	USNRC RIII
Michael Beers	VA Power
B. T. Duke	Duke Energy
David Christian	VA Power
Deborah Corbet-Cooper	VA Power

March 22, 1999

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: YEAR 2000 READINESS AUDIT REPORT, BRAIDWOOD NUCLEAR POWER STATION, UNITS 1 AND 2 (TAC NOS. MA1808 AND MA1809)

Dear Mr. Kingsley:

Enclosed is the Year 2000 Readiness Audit Report which documents the results of the Office of Nuclear Reactor Regulation audit conducted at your facility from January 24 through January 28, 1999.

Please contact me at (301) 415-1321 if you have any questions regarding this matter.

Sincerely,

/S/

Stewart N. Bailey, Project Manager
Project Directorate III-2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-456, STN 50-457

Enclosure: As stated

cc w/encl: See next page

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION (NRR)

AUDIT REPORT

ON

IMPLEMENTATION OF GENERIC LETTER (GL) 98-01

"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket No: STN 50-456, STN 50-457

License No:	NPF-72, NPF-77
Licensee:	Commonwealth Edison
Facility:	Braidwood Station
Location:	Rural Route 1, Box 84 Braceville, IL 60407-9619
Dates:	January 25-28, 1999
Audit Team Members:	Michael Waterman, NRR Mario Gareri, NRR
Approved by:	Jerry L. Mauck, Acting Chief Instrumentation and Controls Branch Division of Engineering Office of Nuclear Reactor Regulation

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- Executive Summary
- Report Details
- 1.0 Introduction
- 2.0 NGG Y2K Project Description
  - 2.1 Project Organization
  - 2.2 Project Plan
    - 2.2.1 Awareness
    - 2.2.2 Initial Assessment
    - 2.2.3. Detailed Assessment
    - 2.2.4. Y2K Testing and Validation
    - 2.2.5. Remediation and Certification
    - 2.2.6. Regulatory Considerations
    - 2.2.7. Contingency Planning
    - 2.2.8. Y2K Program Management
    - 2.2.9. Electric Grid Issues
    - 2.2.10. Critical Suppliers
- 3.0 Audit Team Observations
- Attachments

Executive Summary

From January 25 through January 28, 1999, the NRC staff conducted an audit of the Year 2000 (Y2K) readiness program at the Braidwood Station (BwS) in accordance with the audit plan for this activity.

The purpose of the audit was to (1) assess the effectiveness of the Commonwealth Edison (the licensee) program for achieving Y2K readiness, including continued safe operation of the plants as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the licensee's Nuclear Generation Group (NGG) Y2K readiness program and conducted interviews with cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the licensee's NGG Y2K readiness program, the following observations were made:

1. The licensee has a common Y2K project implementation plan for all its nuclear facilities. The NGG Y2K project plan establishes the scope and control of the Y2K activities at the Braidwood Station. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."
2. The licensee's Y2K program is receiving appropriate management support and oversight. Sponsorship for the licensee's Y2K program is aggressive, proactive, and effective.
3. The licensee began the formal Y2K readiness program in January 1998, and finished the plant inventory and initial assessment phase on March 5, 1998. The detailed assessment phase for systems and components was completed in October 1998. The licensee has established a tightly-controlled schedule for completing Y2K readiness of all applications and systems by June 30, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, and the licensee has received support via information sharing with EPRI, the Utility Services Alliance, the BWR Owners Group, the Westinghouse Owners Group, Mid-America Interconnect Network, Inc. (MAIN), and the North American Electric Reliability Council (NERC).
4. The licensee has started contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the NGG Year 2000 Project Plan. The NGG Contingency Plan is scheduled for completion in March 1999.
5. The licensee is conducting confirmatory testing of Y2K readiness for those systems and applications not certified by vendors on the licensee's approved supplier's list.
6. The licensee's independent assessment of the NGG Y2K project plan was completed on January 25, 1999. Recommendations from that assessment will be addressed by the NGG Y2K project team for subsequent revisions of the NGG Y2K project plan.
7. Materials management is being addressed by the licensee. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future material control.
8. The licensee uses a matrix format for prioritizing Y2K activities among the components. The matrix consists of three date usage risk categories and three safety and regulatory risk categories. This process provides the licensee with an objective, unambiguous methodology for prioritizing

remediation activities.

9. The licensee collects assets with the same manufacturer nameplate data into component evaluation packages (CEPs). The results of an evaluation of a single asset are then extrapolated to the remaining assets in the CEP. This process allows efficient use of remediation resources; however, the underlying assumption that all assets with the same manufacturer nameplate data are identical may not be valid in every case.
10. The licensee has committed to remediate all assets, regardless of priority, by June 30, 1999. This commitment may be adversely affected if the process used for extrapolating a single component evaluation to all other components in the same CEP does not prove to be valid. The licensee is reviewing this issue.

Report Details

1.0 Introduction

The objectives of the ComEd NGG Y2K readiness program audit at the Braidwood Station were to:

1. Assess the effectiveness of the licensee's program for achieving Y2K readiness, including continued safe operation of the BwS plants as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems,
2. Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and,
3. Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan outline (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Response(s) to GL 98-01
- Plant Technical Specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team obtained and reviewed the licensee's NGG Y2K Project Plan, Rev. 0, dated July 21, 1998 (Document Number 2 listed in Attachment 2). Upon arrival at the site, the licensee provided the staff with a draft of Revision 1.

The audit process started with an entrance meeting attended by the Y2K Project

Manager (PM), Y2K project team members, senior and other site personnel, and members of the audit team. The NGG Y2K Project Manager, Mr. Elijah Campbell, described project organization, the project plan and its implementation, project status, and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the NGG project plan and its associated procedures, the plan implementation products (documents and data bases). The auditors also interacted with the BwS Y2K PM and Y2K project team members. The documents reviewed and referenced in this audit are listed in Attachment 2.

2.0 NGG Y2K Project Description

2.1 Project Organization

The NGG Y2K readiness program at BwS has approximately 20 full-time equivalent persons supporting the NGG Y2K project. The PM for the BwS part of the NGG Y2K project is Mr. E. Adams. The BwS PM reports to the NGG Y2K PM, who reports to the Manager of Nuclear Information Systems, who reports in turn to the NGG Y2K Executive Sponsor (Mr. D. Helwig, Senior Vice president, Nuclear Services, Nuclear Generation Group), who reports to the NGG Y2K Project Owner (Mr. O. Kingsley, President, Nuclear Generation Group). The sponsoring efforts have been important to the success of the NGG Y2K program.

The licensee participates with other organizations that are addressing the Y2K problem. The licensee has received support via information sharing with EPRI, the Utility Services Alliance, the BWR Owners Group, the Westinghouse Owners Group, Mid-America Interconnect Network, Inc. (MAIN), and the North American Electric Reliability Council (NERC).

2.2 Project Plan

The NGG Y2K project plan was developed by the licensee to establish the scope and control of the Y2K program, and is applied uniformly at every ComEd nuclear power plant site. The NGG Y2K project plan is based on the guidance provided in NEI/NUSMG 97-07, which was accepted by the NRC in NRC Generic Letter 98-01 as guidance that presents one approach for achieving Y2K readiness. The audit team's review confirmed that the NGG Y2K project plan is based on the guidance contained in NEI/NUSMG 97-07.

The NGG Y2K project plan consists of five major phases; Initial Inventory and Awareness, Detailed Inventory and Assessment, Remediation and Testing, Post Remediation Testing of Non-Embedded Systems, and Notification. The Initial Inventory and Awareness Phase comprises communications with the NGG organization concerning the Y2K issue and its importance; developing a preliminary prioritized list of assets, an unaffected list of assets, and a list of unreviewed systems. The Detailed Inventory and Assessment phase consists of walkdowns, creation of component evaluation packages (CEPs), initial contacts with vendors, collection of industry information, Y2K susceptibility testing, creation of a remediation asset list, software application remediation activities, and evaluating supply chain vulnerabilities. The Remediation and Testing phase comprises the elements of contingency planning for Y2K susceptible assets, and repair, replacement or retiring Y2K susceptible assets. The Post Remediation Testing of Non-Embedded Systems phase comprises testing of software applications and embedded systems, and performing post-modification verification and testing. The Notification phase comprises final certification of assets, updating of the CEP asset database, archival of project quality records, and communicating certification status to the NRC.

2.2.1 Awareness

The NGG Y2K program, which addresses all ComEd nuclear plants, was begun on December 1, 1997. The NGG Communication Plan, dated September 8, 1998, prescribes actions for briefing NGG management, educating the general population of NGG personnel via departmental newsletters, training personnel who are to perform inventory and assessment activities, and coordinating Y2K team communications. Based on communications reviewed by the audit team, the staff concluded that the licensee has an effective Y2K awareness program.

2.2.2 Initial Assessment

The Initial Inventory and Awareness Phase comprises communications with the NGG organization concerning the Y2K issue and its importance; developing a preliminary prioritized list of assets, an unaffected list of assets, and a list of unreviewed systems.

The licensee contracted with Litton Enterprise Solutions (LES) to develop an initial inventory of NGG assets. The initial assessment inventory methodology document was completed on March 31, 1998. LES provided the licensee a database of prioritized assets that were categorized by usage, and classified according to date usage risk and safety and regulatory risk. The methodology also provided the initial scope, schedule, and estimated resources required for the next phase of activities.

The licensee identified 3,932 potentially affected embedded systems and components in the NGG. Of these, 3,301 embedded systems are compliant or do not pose a date usage risk, 189 embedded systems are to be remediated, and 142 embedded systems are receiving detailed assessment. The licensee also identified 101 software applications to receive detailed assessment at the BwS site, and 1,198 software applications to receive detailed assessment by the NGG Y2K project team. Approximately 85% of embedded systems and 26% of software applications have been completed.

The inventory includes a prioritization of the identified items. The priorities are based on a combination of three date usage risk levels and three safety and regulatory risk levels. This process provides the licensee with an objective, unambiguous methodology for prioritizing remediation activities. The licensee's prioritization process encompasses the criteria described in NEI/NUSMG 97-07.

During the analysis of the initial assessment, the licensee evaluated the the date usage risk and safety and regulatory risk of each item as the basis for assigning the priority; recommending the approach/plan for detailed assessment, testing, and remediation; and estimating the detailed assessment/remediation cost. The licensee is committed to remediating every system regardless of priority.

2.2.3. Detailed Assessment

Detailed assessments consist of source code examinations, review of vendor certifications and tests, testing systems, and reviewing industry group certifications and tests. Vendor evaluations encompass evaluation of available manufacturer/developer information; such as contracts, correspondence, vendor manuals, internet listings, vendor owners groups, communications with vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Test evaluations involve the development of test procedures and acceptance criteria to determine whether a Y2K problem exists, and to validate Y2K remediation activities.

The detailed assessments performed to date follow the project implementation plan. The audit team found the licensee's documentation sufficient for justifying the results of the detailed assessments, which established Y2K compliance/non-compliance and readiness of systems.

2.2.4. Y2K Testing and Validation

Y2K problem susceptibility testing is based on the licensee's determination of the importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information. Critical and high priority systems and embedded devices manufactured by vendors that are not on the licensees approved supplier list are tested by the licensee or through a Y2K testing contract regardless of vendor certification. The licensee's Y2K project team developed the onsite testing procedures to ensure consistency in the implementation of Y2K susceptibility testing.

When plant equipment is also present in the plant simulator, the simulator equipment is used as the base test equipment, and the plant equipment is then certified Y2K ready by its equivalence to the simulator equipment. The licensee uses available technical manuals and data for establishing equivalence between the simulator equipment and/or redundant channels of plant equipment. Equipment and firmware technical manuals and data under configuration control is the most frequently used source of data for determining equivalence between redundant channels of equipment.

The auditors found only minor documentation discrepancies in some test packages, and in one case, identified a test procedure that needed to be revised to accommodate manual data entry requirements. The auditors discussed these discrepancies with the licensee.

Software systems common to more than one plant site are tested by the NGG Y2k project team. Embedded components and site-specific software applications are tested at the sites. Embedded systems that are common to more than one site and have the same manufacturer nameplate data are tested for Y2K susceptibility at one site. The test results are then extrapolated to the embedded systems at the other sites. This testing philosophy may not account for variations in embedded systems subcomponents that are not considered by the vendor to be significant enough to warrant a change in the nameplate data. The auditors discussed this vulnerability in the licensee's testing approach. The licensee will verify the similarity of equipment in the CEPs to determine whether additional testing is required.

2.2.5. Remediation and Certification

Remediation is the process of retiring, replacing or modifying software or embedded software devices that are to be retained in service, but have been determined to be affected by the Y2K problem. The program implementation plan provided Y2K compliance criteria for replacement or modification. After remediation is completed, validation testing is required. The licensee is performing the required Y2K remediation validation testing using the test procedures and test plans developed by the Y2K project. The licensee develops contingency plans for each software application or embedded system that is Y2K susceptible before remediating the vulnerabilities.

Certification is the completion and documentation of Y2K readiness activities for individual systems and components. This includes documentation of validated system modifications and development of required contingency plans. The audit team found the resulting certifications to be acceptable.

2.2.6. Regulatory Considerations

The NGG Y2K project plan and associated documents include references to existing plant procedures that have guidance on regulatory considerations, such as applicability of 10 CFR50.59 for plant modification reviews, reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.7. Contingency Planning

The licensee has begun contingency planning using a framework similar to that described in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The licensee's contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07. The licensee's schedule for completion of the project contingency plans is realistic.

The licensee is addressing internal and external communications, phone repair, billing, and telephone equipment in the offices. The licensee is also evaluating microwave systems, regional radio components, nuclear onsite radio/paging systems (which are different at each site), blackstart radios, telephone systems, and vendors for certifying compliance. The licensee is using a find it and fix it approach that is consistent with the Y2K plan.

The licensee developed the project scope based on discussions with project managers. Projects are staffed with subject matter experts (SMEs), who helped identify the inventory, and purchase records and physical inventory. The licensee conducted cross team meetings with other business units to identify corporate telephony assets. Additionally, the licensee used vendor websites for analysis, obtained letters from vendors, and contracted with Motorola to help identify inventory assets. In some instances, the NGG Y2K sponsor or NGG Y2K owner has personally called a vendor to get responses to a questionnaire.

The licensee has conducted some testing of systems that had vendor certifications if the certifications were vague or needed additional clarification. Some systems could not be easily tested, and the licensee had to work around these obstacles. Contingency plans were based on probability of failure, and the impact of the failure. These evaluations are part of the package documentation. This information was also extracted for developing contingency plans for transmission and distribution (T&D) systems and individual equipment.

As with the other areas of the licensee's Y2K project, in addition to using SMEs to reviewed equipment, the licensee gathered data from materiel data base extractions, and conducted walkdowns to identify potential Y2K problems. The licensee has materials specialists for each piece of equipment, and a lab for testing equipment. Testing was done in house for protective relays, which are microprocessor based. The licensee has found one relay that cannot be force set to 2/29/2000. However, this relay operates correctly when its clock rolls into and rolls out of that date.

Communications are through leased phone lines with diverse communications through microwave, fiber networks, and leased lines. Ameritech is the phone company that provides telecommunications to the licensee. Ameritech is working with the licensee to determine Y2K contingency plans. Meetings have been conducted on a regular basis. MAIN has also recommended that utilities develop backup communications means that are integrated throughout NERC.

The licensee will be watching time zones to the east to anticipate potential problems. The licensee has approximately 100 contingency plans from various organizations that will be integrated. MAIN members

will do a peer review on May 1, 1999. The licensee is scheduled to have approved operating plans by May 30, 1999.

2.2.8. Y2K Program Management

The licensee's Y2K program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a format that defines the progress of each Y2K system being evaluated. The licensee conducts teleconferences twice weekly between each plant site and corporate management.

2.2.9. Electric Grid Issues

The audit team discussed electric grid issues with the licensee. The licensee provides power to the MAIN, which is one region in the NERC. The licensee has initiated activities to address grid reliability with respect to the Y2K problem. The licensee produces a net system load approximately 20,000 MW, of which approximately 9,600 MW are produced by nuclear power plants. The licensee anticipates the load to be 8,000MW during the Y2K date rollover. The licensee is surveying the customer base to determine whether the customers will be ready, and what they plan to do. The licensee is also evaluating means of tracking load changes faster. The licensee expects all nuclear plants to be online.

Each utility in MAIN is required to have a grid restoration plan. The licensee is evaluating contingency plans that will ensure the grid remains operable. The licensee considers balancing the grid load and generation as the biggest risks to grid stability. The licensee plans to have significant reserves available during the rollover period by carrying more than the normal mix of generating capabilities, and maintaining a diverse generating capability. The licensee is also evaluating the strategies used in other grids too.

MAIN has a Y2K contingency planning workforce. Each member utility has a representative, and the workforce meets about once per month to develop guidelines and individual contingency plans that are consistent throughout the grid. The status report to MAIN is due by March 31, 1999, and will describe the Y2K operating plan. The licensee is also attending conferences hosted by NERC and others regarding Y2K contingency planning.

Transmission and distribution equipment has been surveyed and nothing has been found to date that is highly susceptible to Y2K. The licensee has tested systems and components, and upgrades have been completed as of November 1998. Most remediation was in the area of software - date related issues regarding billing, etc. Some of the T&D testing equipment was found to need some remediation. The licensee is replacing the distribution automation system regardless of Y2K susceptibility. To date, 107 applications have required remediation; about half of these systems have been remediated. All that remains is medium and low priority systems and components.

2.2.10. Critical Suppliers

In May 1998, the licensee requested Y2K information from 1,265 suppliers who provide nuclear materials. The licensee followed up on the initial questionnaire in December with telefaxed information and followup letters to the suppliers who had not responded to the licensee's request for information. Additionally, the licensee sponsors an annual conference with its key suppliers each October. During the

last conference, Y2K was the subject of one presentation. This presentation helped bring the critical suppliers on board because the presidents and vice presidents of these companies were present at the conference. The questionnaire allowed the licensee to reduce the suppliers list from the initial 1,265 suppliers to approximately 800 suppliers. The licensee made many telephone calls to reduce the number of suppliers who had not responded to the licensee's questionnaire. The Project Owner (Mr. Oliver Kingsley) and the Project Sponsor (Mr. David Helwig) made calls to the presidents and vice presidents of the remaining 16 companies. To date, the licensee has received responses from all but four suppliers.

The licensee reviewed the responses to rate the supplier's processes for ensuring Y2K readiness and for evaluating the criticality of the supplies. This rating process was then used to identify potential needs for contingency plans. About three out of four of the suppliers' responses were judged to be questionable. The licensee estimates that there are about a dozen suppliers who will require Nuclear Utilities Procurement and Inspection Committee (NUPIC)-level auditing by the licensee.

The licensee is reviewing warehouse inventories to identify the components that need to be replaced or remediated. There are 3,900 Equipment Part Numbers (EPNs), which the licensee will review a second time after remediation is completed to ensure noncompliant EPNs have not been added to the inventory.

3.0 Audit Team Observations

The audit team reviewed in detail 23 software applications packages and 22 embedded systems component evaluation packages. The licensee's documentation was sufficient for justifying the results of the assessments of Y2K compliance/non-compliance.

The following observations were made by the team auditing the ComEd NGG Y2K readiness program, as it was applied at BwS.

1. The licensee has a common Y2K project implementation plan for all its nuclear facilities. The NGG Y2K project plan establishes the scope and control of the Y2K activities at the Braidwood Station. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness."
2. The licensee's Y2K program is receiving appropriate management support and oversight. Sponsorship for the licensee's Y2K program is aggressive, proactive, and effective.
3. The licensee began the formal Y2K readiness program in January 1998, and finished the plant inventory and initial assessment phase on March 5, 1998. The detailed assessment phase for systems and components was completed in October 1998. The licensee has established a tightly-controlled schedule for completing Y2K readiness of all applications and systems by June 30, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, and the licensee has received support via information sharing with EPRI, the Utility Services Alliance, the BWR Owners Group, the Westinghouse Owners Group, MAIN, and NERC.
4. The licensee has started contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the NGG Year 2000 Project

Plan. The NGG Contingency Plan is scheduled for completion in March 1999.

5. The licensee is conducting confirmatory testing of Y2K readiness for those systems and applications not certified by vendors on the licensee's approved supplier's list.
6. The licensee's independent assessment of the NGG Y2K project plan was completed on January 25, 1999. Recommendations from that assessment will be addressed by the NGG Y2K project team for subsequent revisions of the NGG Y2K project plan.
7. Materials management is being addressed by the licensee. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future material control.
8. The licensee uses a matrix format for prioritizing Y2K activities among the components. The matrix consists of three date usage risk categories and three safety and regulatory risk categories. This process provides the licensee with an objective, unambiguous methodology for prioritizing remediation activities.
9. The licensee collects assets with the same manufacturer nameplate data into CEP. The results of an evaluation of a single asset are then extrapolated to the remaining assets in the CEP. This process allows efficient use of remediation resources; however, the underlying assumption that all assets with the same manufacturer nameplate data are identical may not be valid in every case.
10. The licensee has committed to remediate all assets, regardless of priority, by June 30, 1999. This commitment may be adversely affected if the process used for extrapolating a single component evaluation to all other components in the same CEP does not prove to be valid. The licensee is reviewing this issue.

Attachments

Attachment 1

A. Project organization
B. Project Manager -
C. Project Sponsor -
1. Participation in Owners Group, Group activities related to the Y2K effort, (EPRI, NEI). Peer review efforts.
2. Corporate activities
3. Schedule of activities for Y2K readiness

Activity	Starting Date	Finishing Date
Communication/ Awareness		
Project Plan		
Inventory		
Detailed analysis/testing		
Remediation		
Validation/testing		
Contingency Planning		

4. Inventory

(Review the Information Database.)

Classification:

5. Analysis -
   Number of items identified as Y2K compliant. Review how this was determined - Vendor data; any additional testing.
   Number of items not Y2K compliant -

Accept As Is: (Review how this was determined. ___ require validation testing. Check vendor data, Owners Group data, any testing by vendor?)

a) Vendor evaluation - validation testing based on criticality of item, prior experience with vendor, extent of documentation, or plant knowledge of the item
b) Plant owned or supported software (including tools) evaluation - knowledge based decisions, scanning, testing. When testing proposed, need test specifications and procedures.
c) Interface evaluation - Part of corporate plan (?) Grid, substation, communication,
d) Embedded components evaluation - knowledge based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. (Review the documents when this is the case.)

6. Remediation - Use of existing software procedures (?). Verify long term commitments for maintaining Y2K readiness.
7. Y2K Testing and Validation
   - Assessment testing - Per Computer problem/change reports (PCRs) and associated V&V plans and test procedures.
   - Testing subsequent to remediation - unit testing; integration testing; system testing.
8. Regulatory Considerations - 10 CFR 50.59 reviews; reportability evaluations per 10 CFR 50.72, 50.73 and part 21; operability determinations.
9. Contingency Planning - NEI/NUSMG 98-07
   Internal Risks
   External Risks
   Remediation Risks (Vendor support, resource limitations, etc.)
10. Y2K Management Plan-
   Tracking against milestones of the project. Management awareness. Status reporting
   External resources
   Use of existing procedures for software QA, configuration management, V&V., Documentation
   Audits (any audits done/reports issued).

Attachment 2

Documents Reviewed

1. NGG Y2K Project Team (Roster of Participants)
2. "NGG Year 2000 Project Plan," Rev. 0, dated
3. NGG Y2K Organization
4. Device & Application Inventory

5. NGG Y2K Audit Entrance Meeting Slide Handouts

March 12, 1999

Mr. J. V. Parrish
Chief Executive Officer
Washington Public Power Supply System
P.O. Box 968 (Mail Drop 1023)
Richland, Washington 99352-0968

SUBJECT: AUDIT REPORT ON THE YEAR 2000 (Y2K) READINESS PROGRAM FOR WNP-2 (TAC NO. MA1907)

Dear Mr. Parrish:

From January 26, 1999 to January 29, 1999, the NRC staff conducted an audit of the Year 2000 (Y2K) program at WNP-2. The purpose of the audit was to (1) assess the effectiveness of the Washington Public Power Supply System's (the licensee) programs for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding WNP-2 and conducted interviews with cognizant licensee personnel. Enclosed for your information is the Year 2000 readiness audit report for WNP-2.

Please contact me at 301-415-1424 if you have any questions regarding this audit and its findings.

Sincerely,

Original Signed By

Jack Cushing, Project Manager
Project Directorate IV-2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosure: Audit Report

cc w/encl: See next page

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

AUDIT REPORT

ON

IMPLEMENTATION OF GENERIC LETTER 98-01

"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket No:	50-397
License No:	NPF-21
Licensee:	Washington Public Power Supply System (WPPSS)
Facility:	WPPSS Nuclear Project No. 2 (WNP-2)
Location:	Richland, Washington
Dates:	January 26 - January 28, 1999
Audit Team Members:	Matthew Chiramal, NRR W. Keith Mortensen, NRR Robert Brill, RES
Approved by:	Jerry Mauck, Chief (Acting) Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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      - 2.2.2.3 Classification
      - 2.2.2.4 Prioritization
      - 2.2.2.5 Analysis of Initial Assessment
    - 2.2.3 Detailed Assessment
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Executive Summary

From January 26 to January 28, 1999, the staff of the U. S. Nuclear Regulatory Commission (NRC) conducted an audit of the Year 2000 (Y2K) program at the Washington Public Power Supply System (WPPSS) Nuclear Project No. 2 (WNP-2). The purpose of the audit was to (1) assess the effectiveness of the programs of WPPSS (the licensee) for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to ensure that the licensee's schedule follows the NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected items from the licensee's documentation regarding WNP-2 and conducted interviews with cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

On the basis of its assessment and evaluation of the WNP-2 Y2K readiness program, the audit team concluded as follows:

The WNP-2 Year 2000 Project Plan and associated detailed procedures for implementing the plan at WNP-2 are considered to be excellent. They are comprehensive and detailed documents which incorporate the guidance of GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," and NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness." The plan includes the outline of Contingency Planning and associated instructions that are based on the guidance of NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."

1. WNP-2 is using existing quality assurance (QA) and modification program procedures as well as Y2K-specific plant procedures to achieve Y2K readiness. The applicable considerations for regulatory requirements and criteria are addressed in the Year 2000 Project Plan implementation activities. The licensee has been sharing data and work experience through activities in the BWR Owners Group Y2K subcommittee; United Service Alliance; Litton Enterprise Systems Readiness database; EPRI conferences, workshops, and database; and NEI and NUSMG workshops.
2. The project is well organized and adequately staffed with plant and contractor staff. The Project organization includes a Contingency Planning Lead as the single-point-of-contact for the

contingency planning process. Based on the audit team's interaction with the project staff, the audit team considers the Y2K project staff to be very competent and knowledgeable in the activities they perform.

3. WNP-2 Y2K readiness including contingency planning is scheduled to be achieved by July 1,1999. The audit team noted that the project emphasis has been on addressing the embedded systems; and the successful completion of activities to achieve their Y2K readiness by July 1, 1999 appears to be on track. However, regarding the Y2K readiness activities of software assets, the audit team echoed the concern on their progress raised by the October 1998 self assessment and the January 1999 quality audit. The audit team noted the corrective actions planned and taken in response to the recommendation of the assessment teams, particularly the reorganization of the Y2K project in October 1998, its prominence in the organization, the addition of responsibility for software asset activities, and the increased resources provided. These actions will help in meeting the project schedule of having all critical, high, and medium priority assets Y2K ready by July 1999.
4. The WNP-2 licensee has not identified any Y2K problems with systems needed for safe shutdown of the plant.
5. Critical to the completion of WNP-2 Y2K project is the completion, on schedule, of the four "related projects" that are separate from the Y2K project. The audit team identified that the Y2K program schedule has no flexibility to account for unforseen problems in the Y2K readiness activities of the four related projects, and the remaining work on software assets and embedded systems. The Y2K project manager (PM) and project sponsor acknowledged this and stated their intent to address the issue.
6. Based on the audit team's review of several project work packages of the assets the audit team observed that, although incomplete as certification packages, most of the documentation and contents are consistent and follow the guidance provided by the WNP-2 Y2K Program Plan. Some inconsistencies were noted and identified to the PM. The PM intends to feedback as "lessons learned" some of the examples of inconsistencies and, additionally, will require thorough reviews during certifications to resolve the inconsistencies. The PM also plans to issue completed system-level packages for certification starting in March 1999, along with additional guidance to ensure consistency.

1.0 Introduction

The objectives of the audit of the WNP-2 Y2K Program were to:

- Assess the effectiveness of the WNP-2 programs for achieving Y2K readiness including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems
- Evaluate Y2K program implementation to ensure that the licensee's schedule is in accordance with NRC GL 98-01 guidelines for achieving Y2K readiness by July 1, 1999
- Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems

The audit was conducted in accordance with the established audit plan

(http://www.nrc.gov/NRC/Y2K/y2kaudit.html), which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
- Licensee Responses to GL 98-01
- Plant technical specifications and license terms and conditions
- Applicable NRC regulations
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"
- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Before the audit at the plant site, the audit team reviewed the WNP-2 Y2K Project information that the licensee had sent in advance to NRC Headquarters. This information included the WNP-2 Year 2000 Project Plan, Revision 1, dated December 1, 1998; the licensee's response to GL 98-01; an organizational chart; selected Y2K procedures; the Y2K Project schedule; a Y2k status report; samples of documentation packages; and other items of interest to the audit team.

The audit process began with an entrance meeting attended by the WNP-2 Y2K Project Manager and other plant personnel and members of the NRC audit team. The WNP-2 Y2K Sponsor was not able to attend the entrance meeting because of a presentation being made to the Washington State legislature regarding the status of Y2K preparations at WNP-2. The plant Engineering Manager acted for the sponsor at the entrance meeting. Members of the WNP-2 Y2K organization described the project organization, the project plan, the implementation of the project, and the project's current status. Attachment 1 is a list of the attendees at the entrance meeting.

For the rest of the audit activity, the audit team reviewed the WNP-2 Year 2000 Project Plan and associated project documentation and interacted with the WNP-2 Y2K team personnel. The documents reviewed by the audit team are listed in Attachment 2.

The audit activity concluded in an exit meeting in which the audit team summarized the results of the audit. Attachment 3 is a list of the attendees at the exit meeting.

The WNP-2 Y2K Project schedule is provided in Table 1.

2.0 WNP-2 Project Description

2.1 Project Organization

The corporate senior level sponsor for the WNP-2 Y2K Project is the Vice President of Operations Support, R. L. Webring. As a result of a self-assessment activity the project team was reorganized in November 1998. In the resulting organization G. L. Gelhaus was assigned to be the WNP-2 Y2K Project Manager.

The Y2K Project Manager is responsible for the overall management of the Year 2000 Project. His responsibilities include; (1) developing the Year 2000 Project Plan, (2) tracking all phases of the project, (3) keeping the senior sponsor current on project progress, (4) developing a Y2K project budget and (5) successful completion of the project. In addition, the Y2K Project Manager will be the single point of

contact for the NRC as identified in GL 98-01. The Y2K Project Manager is supported by the core team. The core team consists of 16 dedicated full-time WNP-2 and contractor employees and the full-time equivalent of approximately 10 additional WNP-2 and contractor contributors. The core team is responsible for conducting detailed assessments, remediation planning and remediations.

The Y2K core team is supported by the Y2K extended team. The extended team consists of representatives from affected WPPSS organizations. The extended team assists the WNP-2 Y2K effort by:

- Acting as a focal point for communications between the Y2K core team and site organizations for which the extended team member is responsible;
- Coordinating the inventory (hardware, software, and embedded devices), testing and Y2K issue resolution within their organization;
- Bringing Y2K issues to the attention of the Y2K Project core team;
- Participating in briefings and training sessions for various Y2K activities; and
- Aiding in the general awareness of the Y2K problem.

Points of interaction have been designated with line organizations so that help from supporting organizations may be obtained in such areas as remediation planning and contingency planning. A Remediation Review Panel, consisting of the Manager of Operations, Quality Supervisor, Manager of Engineering, and Chief Information Officer has been established to review and concur on any impacts on WNP-2 assets, including recommended modifications, work-arounds, "use-as-is" dispositions, and contingency plans. This concurrence by Site Management of the impact of Y2K on the important assets is sought in addition to the approvals of the asset owner and the Y2K Project Manager. The objective of the panel is to ensure that site management agrees to the risks and expenditures of resources so that the Y2K Project team does not make the risk and resource decisions without the knowledge of the appropriate management.

In addition four major computer system (replacements) projects titled "Related Projects," although managed independently from the Y2K project, are tracked by the project manager for Y2K readiness because their completion on time is critical to the success of the Y2K project. These are: (1) the Control Room Plant Data Information System (PDIS) Project, (2) the PeopleSoft Project, (3) the Client Server Project and (4) the Passport Project.

2.2 Project Plan

The WNP-2 Year 2000 Project Plan, Revision 1, dated December 1, 1998, is the plant-specific plan that was developed by the licensee. It is based on the guidance provided in NEI/NUSMG 97-07, which was endorsed by the NRC in NRC GL 98-01 as guidance that when properly implemented presents one approach for achieving Y2K readiness. The plan was organized around the inventory and assessment processes developed by Litton Enterprise Solutions (LES). The audit team's review confirmed that the WNP-2 Year 2000 Project Plan is based on the guidance contained in GL 98-01 and NEI/NUSMG 97-07.

The WNP-2 Year 2000 Project Plan, Revision 1, includes the following phases: awareness, initial

assessment, detailed assessment, remediation, and notification. It also includes requirements for Y2K testing and validation (Y2K investigative testing during detailed assessment and confirmatory testing after remediation), regulatory considerations, contingency planning and risk management, QA, and documentation and retention of records.

WNP-2 has used several contractors in the building of the inventory of Y2K-susceptible assets and to perform detailed assessments, training, and independent evaluations. These contractors include personnel from LES (procedures, training and initial inventory assessment), Raytheon (detailed assessments of embedded systems), Bechtel (embedded system testing), CANUS (test training and independent evaluation), and Lockheed Martin (detailed assessments and remediation of software assets).

2.2.1 Awareness

An early significant event in the Y2K awareness phase of the Y2K program was G. L. Gelhaus's presentation of the Year 2000 Project Overview for System Engineers on April 30, 1998. This presentation was followed soon after by the formal Y2K kickoff with plant management on May 5, 1998. The licensee attempted to involve all employees in the effort to identify assets that might be sensitive to the Y2K problem. The purpose of the initial communications was to raise general awareness of the issue and to communicate its importance to the organization. The audience included the following personnel:

- Management
- Operations
- Subject matter experts
- System engineers
- Software or system sponsors
- General employees
- Support organizations such as procurement and engineering programs.

The awareness effort is ongoing. Recently a site-wide challenge was issued to all employees to identify items not already in the Y2K database, and a reward of a free lunch was offered those who were successful. As a result, 23 entries were submitted, of which 12 were assets not previously included in the inventory of digital assets (for example: digital camera and label maker). On the basis of its review of the licensee's communications, the audit team concluded that the licensee's Y2K awareness program is effective.

2.2.2 Initial Assessment

The initial assessment phase of the WNP-2 Y2K Project began in January 1998. The purpose of the initial assessment was to identify all software applications and embedded system components at WNP-2, an effort that required input from the Y2K support team. The tasks of initial assessment included (1) inventory, (2) categorization, (3) classification, (4) prioritization, and (5) analysis of the initial assessment. In the identification of embedded systems, the Y2K support team reviewed procedures and documentation for phrases that would indicate the existence of an internal clock or processor; surveyed the vendors for information on their equipment; performed system walk-down inspections; and reviewed schematics, program listings, and reference manuals.

2.2.2.1 Inventory

The initial inventory consisted of a list of over 90,000 assets. The list was derived from the following sources:

- PASSPORT (master equipment list) database
- Procedures and documentation in which certain phrases might indicate the existence of an internal clock or processor
- Information from vendors about their equipment
- System walkdown inspections
- Schematics, programming listings, and reference manuals
- Miscellaneous lists of departmental assets

The licensee's team reviewed this list and removed from the inventory obvious nonsusceptible items such as snubbers, mechanical equipment, pipe spools, and non-digital valves. This reduced the list to about 3000 assets with potential for Y2K susceptibility. These assets were then sorted according to system and referred to the system engineers for review.

The embedded systems inventory was performed with the assistance of LES resources in accordance with WPPSS Instruction Number ENG-DES-26, "Year 2000 Readiness Assessment Methodology." This information was used to prepare advance information packets for interviews with System Engineers and I&C technicians. The information gathered from these processes defined the initial embedded system inventory.

The embedded system inventory, kept in a database procured from LES, typically contained the following information:

- Unique identification of software or component
- Description
- Manufacturer
- Version number (software)
- Model number (hardware)
- Responsible organization
- Initial compliance status
- Contact name
- Classification
- Categorization
- Prioritization

The inventory process for software assets is not as direct as the inventory of embedded assets. Software applications do not have formally tracked asset numbers ("EPN" numbers) and, therefore, do not all appear in one central database. The inventory of the software assets began with the Software Quality Assurance (SQA) listing of controlled software. The list was then expanded to include individual department listings of software. The non-SQA software assets are generally work-saving programs that are not used directly in safety-related plant applications. However, the loss of these programs would

result in significant inconvenience. The Y2K team is taking additional steps to ensure that all the non-SQA programs are included in the inventory.

2.2.2.2 Categorization

After the inventory was made, the Y2K team categorized the inventoried items. Categorization is the process that groups applications, systems, and components to allow management to efficiently assign resources to the classification and prioritization activities. Each item included in the initial inventory was assigned to a category. The categories used at WNP-2 were similar to those identified in NEI/NUSMG 97-07, as follows:

- Telecommunication equipment
- Embedded devices
- Test equipment
- Software interfaces,
- Facilities
- Software Applications
- Chemistry & Environmental
- Emergency Planning
- Health Physics
- Mainframe hardware
- Network
- Simulator
- Training

2.2.2.3 Classification

Classification is the process by which the Y2K project team evaluated potential risk factors to obtain criteria for assigning resources to evaluate and resolve potential Y2K problems. The Y2K project team assigned risk categories to facilitate the process of determining the order in which to perform the detailed assessment of the inventoried items. Two types of risk were defined: (1) date usage risk (DUR), and (2) safety and regulatory risk (SRR). The Y2K project team evaluated DUR assignments for information systems (IS) infrastructure and for limited use hardware and software applications and SRR assignments for plant embedded and telecommunication items and IS infrastructure and limited use items.

Each of the two types of risk has three defined category levels, as follows:

The DUR categories indicate the level of urgency that the date or time function has on the application, system, or component. The three categories of DUR are as follows:

Category I	Date or time stamped data or data for long-term averaging, integrating, trending, scheduling, or reporting.
Category II	Data used for short-term averaging, integrating, trending, scheduling, or reporting.
Category III	Data used for time-independent calculations or operations.

The SRR categories indicate the level of impact on plant and personnel safety, continued generating

capability, and other facility operating capabilities that the application, system, or component may have if the potential Y2K problem is not resolved and/or mitigated.The three categories of SRR are as follows:

Category I

The application, system, or component:
Is, of itself, nuclear-safety related equipment
Controls a nuclear-safety related application, system, or component
May force an immediate or near-immediate plant shutdown
Is used for nuclear-safety related activities or calculations
Provides automatic control of critical plant functions
May require entry into a technical specification limiting condition for operation (LCO) with a limit of 48 hours or less
May degrade the ability to protect the health and safety of the general public

Category II

The application, system, or component:
May degrade the ability to protect the health and safety of plant personnel
May degrade the control of plant habitability systems
May require entry into an LCO with a limit of more than 48 hours
May affect the control or tracking of other critical plant information or operations
Is required by regulations or license commitments

Category III

The application, system, or component:
Controls other plant systems
May affect the control or tracking of other plant information or operations
Is required to meet guidelines from the Institute of Nuclear Power Operations (INPO) or other quasi-regulatory requirements
May affect other non-plant applications or systems not covered by Categories I or II

2.2.2.4 Prioritization

The Y2K project team prioritized the inventory to ensure that resources were effectively allocated to high-risk, high-priority items as follows:

Priority	Safety and Regulatory Risk (SRR)	Date Usage Risk (DUR)
Critical	I	I
Critical	I	II
High	II	I
High	II	II
Medium	I	III
Medium	III	I
Low	II	III

Low	III	II
Low	III	III

Other factors beyond the above risk categories also determine prioritization of the inventory results. These other factors included the following:

- Items known to have Y2K failures or vulnerabilities.
- Complexity of testing or remediation strategy. If a system or component might require a plant, system, or component outage, the Y2K project team assigned a higher priority to this item over non-outage items with higher risk ratings. Items that required engineering design packages for remediation also received a higher priority.
- The number of items requiring testing/remediation. When the Y2K project team identified a common component and the number of the items requiring attention was large, it assigned a higher priority to this inventory item.
- Long lead time items. The Y2K project team assigned a higher priority to these items, which included items that required testing and remediation by outside agencies whose services might become increasingly difficult to obtain as the year 2000 nears.
- Availability of replacement parts and components.
- Input from WNP-2 management.

The Y2K project team assigns all assets having priorities of "Critical" or "High" as "Mission Critical."

2.2.2.5 Analysis of Initial Assessment

The final step of the initial assessment was to determine the scope, schedule, and estimated resources required for the detailed assessment on the basis of initial prioritization and categorization. This step also involved business considerations and decisions. The licensee completed the initial assessment in July 1998.

Of a total 3084 assets (2373 embedded systems and 711 software items), the licensee has assigned 810 as Mission Critical (of which 753 are embedded systems), 411 as Medium and 1863 as Low.

2.2.3 Detailed Assessment

The licensee has not yet completed the detailed assessment phase. This is scheduled for completion by May 30, 1999. The purpose of the detailed assessment is to obtain sufficient information about each inventoried item to determine its expected Y2K performance. Detailed assessments are performed in accordance with one of two WNP-2 procedures, i.e., ENG-DES-26 or SWP-CSW-03. The Y2K project team uses assessment results to make decisions regarding actions required for any remediation. The detailed assessment phase includes, as appropriate, the consideration of information from other databases, vendor evaluations, investigative testing, or the conducting of engineering evaluations to identify any deficiencies and their failure modes and effects. The licensee states that as of February 1999, 89% of Mission Critical detailed assessments and 82% of the total detailed assessments have been completed. The remaining asset assessments, including the necessary remediation, are scheduled to be completed by June 1999.

The testing of embedded systems and software systems is performed using test plans based on PPM

8.3.402, "Testing of Year 2000 (Y2K) Readiness." The test plans include a 10 CFR 50.59 screening, if required, to ensure that the test does not result in an unreviewed safety question. Whenever testing is performed, expected results are identified to the extent possible before testing. (See Section 2.2.4.1 below for additional discussion on testing.)

Deficiencies identified during the detailed assessments are reported on a Problem Evaluation Request (PER) form. Each PER is assigned to a responsible person for remediation, assigned a completion date, and entered into the plant tracking log. The remediation plan is reviewed and approved by the "owner" of the system, application, facility, or equipment and recorded into

the Y2K readiness database. In addition, the remediation plans are also reviewed by the WNP-2 Y2K Remediation Review Panel.

2.2.3.1 Vendor Evaluation

As a part of detailed assessment activity, the Y2K project team determines whether the Y2K susceptible items are vendor supported so that responsibility for subsequent activities can be established. For assets supported by vendors, a determination is made for the appropriate commercial instrument (contract, license agreement, interface plan, etc.) to be used for detailed evaluation and remediation activities. These activities may include remediation by the vendor, cooperative efforts with the vendor, or the issuance of a request for Y2K information and certification from the vendor. For items determined to be vendor supplied, but for which no vendor support is available or forthcoming, the item is evaluated using WPPSS resources or cooperative agreements with other utilities, using the Y2K process defined in NEI/NUSMG 97-07. For the majority of the items, the detailed evaluation is performed or verified by the WNP-2 Y2K project team.

For vendor responses that indicate that an application or device is Y2K ready or compliant the Y2K project team decides whether to perform confirmatory testing. The decision is based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or WPPSS knowledge of the item.

Based on the review of some "Low" priority asset documentation, the audit team noted that the Y2K project team appeared to give less attention to the non-safety-related and non-operating-plant software and personal computers (PCs). For example, they were grouping their PCs by type, and testing one of each type. There may be differences in the BIOS of two PCs having the same part number but different dates of manufacture. Also there could be a problem with stand-alone software. Many suppliers do not upgrade the version number for minor changes. This was identified as a potential implementation problem.

2.2.3.2 Evaluation of Licensee Owned or Supported Software

The Y2K project team evaluates WPPSS owned or supported software using source codes to identify Y2K issues and/or testing of the software for Y2K problems. This evaluation involves the writing of test plans and/or procedures for critical applications. The result of the evaluations is tracked in the Y2K readiness database.

2.2.3.3 Remediation Planning

After an application has been determined to be deficient regarding a Y2K problem, a business decision is made as to whether the application will continue to be used as-is or whether it will be retired, replaced, upgraded, or modified. In instances in which the asset is of low significance, this business decision may precede any detailed evaluation or testing. This business decision is documented to include the options evaluated and their costs, schedules, benefits, and risks. These business decisions involve management and the "owner" of the system, component, or asset.

2.2.4 Remediation or Replacement

Remediation involves retiring, replacing, modifying, upgrading, leaving as is, or testing before use an application as determined in the remediation planning phase. All items in this phase, including warehouse items, are tracked for replacement projects, purchases, conversions, deletions, retirements, and vendor efforts in the Y2K readiness database. Plant software and embedded system changes are approved by the appropriate system engineer or other designated "owner" and reviewed by the Remediation Review Panel.

The licensee has chosen to undertake major upgrading or replacement of computer systems and business software rather than perform extensive evaluation and testing. Many of the computers and computer applications are being retired. The remaining scope is undergoing detailed assessment, testing, and remediation as appropriate. This effort has lagged and the licensee has contracted for additional resources from Lockheed Martin to assist the in-house staff in completing the software applications. The WNP-2 Y2K Project schedule calls for the completion of all remaining detailed assessments of mission critical software and embedded systems by March 31, 1999. (As stated earlier, by the end of February 1999, 89% of Mission Critical detailed assessment has been completed.) Upgrading of the Reactor Building Elevated Release Monitor Computer, the Transient Data Acquisition System Computer, and the Security System Computer are the significant remediations identified and their implementation is scheduled for the Spring 1999 outage. All but one of the required remediations identified to date are scheduled to be completed by July 1, 1999. One computer remediation, deactivation of the control room "Prime" computer, will be completed during the Fall 1999 refueling outage. This last computer upgrade interfaces with the Emergency Response Data System (ERDS) and Graphic Display System (GDS). The upgraded computer system will be running in parallel with the "Prime" and will be Y2K Ready by July 1, 1999, but the exchange of the two computers is scheduled to occur during the Fall 1999 refueling outage.

The audit team concludes that the completion of each of these replacements and upgrades is critical to the success of the WNP-2 Y2K effort. These projects are being closely monitored by the Y2K Project Manager.

2.2.4.1 Testing and Validation

The WNP-2 Y2K Project Plan includes investigative testing in support of evaluation efforts during the detailed assessment phase, if needed, to determine if a Y2K problem is present. Similarly, Y2K confirmatory testing to validate conclusions reached by the detailed assessment is also an option. For Mission Critical assets, Y2K confirmatory testing following remediation is a requirement in the plan to determine if the remediation activities have eliminated the Y2K problem and no unintended functions are introduced.

2.2.4.2 Certification

Certification involves returning remediated and tested components and systems back into operation and ensuring all documentation is complete. This phase also includes preparation of the documentation required to satisfy GL 98-01. Certification will involve sign-offs by the system engineer or asset owner and the forwarding of the certification package to the Y2K project team who will prepare and file the certification documentation.

2.2.5 Regulatory Considerations

The licensee's Regulatory Affairs Department is responsible for assisting the Y2K project team with regulatory matters related to the Y2K project. This assistance includes maintaining a current awareness of the relevant regulatory climate, advising the team on regulatory strategies including the licensee's response to GL 98-01, interfacing with the NRC on such items as impacts upon the Technical Specification or Final Safety Analysis Report, preparing correspondence to the NRC, assisting with NRC briefings when necessary, and participating in contingency plans.

2.2.6 Notification

The Y2K Project Team will notify the users of the remediated equipment of changes to the software, hardware and systems. This is to include changes to documentation and training due to the Y2K project activities.

2.2.7 Contingency Planning and Risk Management

The licensee began contingency planning activities using NEI/NUSMG 98-07 in November 1998. The project organization includes a Contingency Planning Team with a Contingency Planning Lead as the single-point-of-contact responsible for all contingency planning. The team's mission is to develop an integrated, comprehensive, risk-sensitive contingency plan for Y2K-induced events for WNP-2 and WPPSS functions. The specific areas to be considered for contingency planning include equipment and software remediation readiness, and internally and externally initiated Y2K events.

The audit team evaluated the licensee's contingency planning and found that the licensee has a good organization working on contingency planning issues. One of the concerns that the licensee is addressing is that although they have found that one of the two telephone companies is Y2K compliant, there are not enough trunk lines to handle the expected traffic. The licensee feels that the traffic on January 1, 2000, may exceed a "Mother's Day" load, thus tying up the system. The proposed remediation is to instruct those personnel who will be assigned to be on standby for the entry into year 2000 to report for duty unless they have received a notification to not report. This way, if the phones fail, the needed people will still be available.

The audit team asked the licensee about the local radio broadcast station that is part of the emergency response provision, if they are known to have a Y2K plan to ensure that they will be broadcasting at the turn of the millennium. This had not been covered by the plan as yet, so the licensee called the station and asked. The immediate response was from the station was that they have a Y2K program to assure operation. The licensee will follow up on this issue.

The WNP-2 contingency planning activities for external events is scheduled for completion in February 1999 and the internal events plus remediation are scheduled for completion in March 1999. The

integrated plan is scheduled to be completed in April 1999, with the final approved plan scheduled for mid-May 1999. An assessment of the Y2K contingency plan is planned to be performed to determine the adequacy of the plan. The assessment will be scheduled to allow time for correcting problems before Y2K sensitive dates.

The audit team concluded that the proposed contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07 and that the licensee's schedule for completion of the project contingency plans is realistic.

2.2.8 Y2K Program Management

The WNP-2 Y2K program activities and schedules are tracked by the Project Manager and the Project Sponsor. There are routine weekly project meetings involving the team members and monthly project reviews involving management. Briefings of Corporate Nuclear Safety Review Board and Executive Board are also used as means for management oversight.

The licensee participated with three other utilities in a meeting from July 26 to July 30, 1998 to assess the effectiveness of each of the utilities' Y2K Plans. Each of the four utilities sent two or three participants to participate on the assessment team. The team used guidance provided in NEI/NUSMG 97-07 to compare and contrast the Y2K project plans of each utility with those of the other assessment participants. Several recommendations to the WNP-2 plan were developed and subsequently implemented as a result of this assessment.

WNP-2 conducted its own self-assessment on October 19-24, 1998. The WNP-2 self-assessment team consisted of plant staff as well as industry peers. The purpose of this self-assessment was to evaluate the effectiveness of the WNP-2 Y2K project plan.

An independent consultant review of embedded systems activities in September 1998, and a quality audit in January 1999 are other assessments performed. Additional assessments including one on contingency planning activities is planned.

The recommendations provided by these assessments and audits are being implemented at WNP-2. In November 1998, the Y2K project was reorganized as follows. The leadership was changed; the reporting structure was changed, Lockheed Martin was contracted to augment plant staff dealing with software assets, and an integrated project schedule was developed.

The licensee has augmented the language in procurement contracts to include a standard clause to require Y2K compliance. In addition, a Y2K procurement guide has been developed that is intended to control the existing inventory and new purchases.

2.2.9 Electric Grid Issues

WNP-2 is located within the Northwest electrical grid, which is under the jurisdiction of the Bonneville Power Administration (BPA) and dominated by hydroelectric generation. The BPA grid encompasses a network of major hydroelectric generation facilities operated by the Corps of Engineers, the Bureau of Land Reclamation, and local utility districts. WNP-2 does not own or maintain any transmission lines. WNP-2's main generator and transformers interface directly with BPA's Ashe and Benton substations. Because of their dependence on BPA for grid interfacing, the WNP-2 Y2K Project established a formal

agreement with BPA that BPA would follow the NEI/NUSMG 97-07 guidance for Y2K activities of key substations.

Contingency planning for Y2K critical dates is underway and is being developed in coordination with BPA. The initial "best posture" for WNP-2 has been approved by senior management and forwarded to BPA for integration with the Western States Coordinating Council contingency planning. This "best posture" recommendation involves WNP-2 operating at 80% of full power for the entry into the year 2000.

3.0 Audit Team Findings

The audit team reviewed in detail 13 Mission Critical embedded system packages (see Table 2) and 3 Mission Critical software assets (see Table 3). The team met and interacted with WNP-2 Y2K staff during the review process. The audit team was briefed by the Contingency Planning Lead on the ongoing activities which are presently focused on external interfaces and events.

Based on the audit team's review of WNP-2 Y2K program activities, the audit team has the following observations:

1. The WNP-2 Year 2000 Project Plan and associated detailed procedures for implementing the plan at WNP-2 are considered to be excellent. They are comprehensive and detailed documents which incorporate the guidance of GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," and NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness." The plan includes the outline of Contingency Planning and associated instructions that are based on the guidance of NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."
2. WNP-2 is using existing quality assurance (QA) and modification program procedures as well as Y2K-specific plant procedures to achieve Y2K readiness. The applicable considerations for regulatory requirements and criteria are addressed in the Year 2000 Project Plan implementation activities. The licensee has been sharing data and work experience through activities in the BWR Owners Group Y2K subcommittee; United Service Alliance; Litton Enterprise Systems Readiness database; EPRI conferences, workshops and database; and NEI and NUSMG workshops.
3. The project is well organized and adequately staffed with plant and contractor staff. The Project organization includes a Contingency Planning Lead as the single-point-of-contact for the contingency planning process. Based on the audit team's interaction with the project staff, the audit team considers the Y2K project staff to be very competent and knowledgeable in the activities they perform.
4. WNP-2 Y2K readiness including contingency planning is scheduled to be achieved by July 1,1999. The audit team noted that the project emphasis has been on addressing the embedded systems; and the successful completion of activities to achieve their Y2K readiness by July 1, 1999 appears to be on track. However, regarding the Y2K readiness activities of software assets, the audit team echoed the concern on their progress raised by the October 1998 self assessment and the January 1999 quality audit. The audit team noted the corrective actions planned and taken in response to the recommendation of the assessment teams, particularly the reorganization of the Y2K project in October 1998, its prominence in the organization, the addition of responsibility for software asset activities, and the increased resources provided. These actions will help in meeting

the project schedule of having all critical, high, and medium priority assets Y2K ready by July 1999.

5. The WNP-2 licensee has not identified any Y2K problems with systems needed for safe shutdown of the plant.
6. Critical to the completion of WNP-2 Y2K project is the completion, on schedule, of the four "related projects" that are separate from the Y2K project. The audit team identified that the Y2K program schedule has no flexibility to account for unforseen problems in the Y2K readiness activities of the four related projects, and in the remaining work on software assets and embedded systems. The Y2K project manager (PM) and project sponsor acknowledged this and stated their intent to address the issue.
7. Based on the audit team's review of several project work packages of the assets the audit team observed that, although incomplete as certification packages, most of the documentation and contents are consistent and follow the guidance provided by the WNP-2 Y2K Program Plan. Some inconsistencies were noted and identified to the PM. The PM intends to feedback as "lessons learned" some of the examples of inconsistencies and, additionally, will require thorough reviews during certifications to resolve the inconsistencies. The PM also plans to issue completed system-level packages for certification starting in March 1999, along with additional guidance to ensure consistency.

Tables and Attachments

Table 1
WNP-2 Project Plan Schedule

Activity	Starting Date	Finishing Date
Awareness	April 30, 1998	Ongoing
Initial Assessment		
Embedded Systems	April 25, 1998	July 8, 1998
*Software Systems	*January 1998	Dec. 31, 1998
Detailed Assessments		
Plant Mission-Critical Embedded Systems	July 9, 1998	March 31, 1999
Other Mission-Critical Embedded and Software Systems	July 9, 1998	March 31, 1999
All Medium- and Low-Priority Embedded Systems	September 1998	May 30, 1999
**All Medium- and Low-Priority Software Systems	September 1998	**May 30, 1999
Remediation of All Assets	July 1998	July 1, 1999
Confirmatory Testing	Dec. 21,1998	June 30, 1999
Certification	March 1999	July 1, 1999
Contingency Planning	Oct. 15, 1998	July 1, 1999
External Events		February 1999

Internal Events Plus Remediation Schedules	March 1999
Integrated Plan	April 1999
Management Approval of Plan	May 15, 1999
Contingency Training Complete	Sept. 1, 1999

* Assessments of software assets were formally included in the LES2000 data base in October 1998.
**The licensee may not complete the detailed assessment for some of the low-priority software.

Table 2
Embedded Items Reviewed by the Audit Team

EPN NUMBER	Asset Description, System, Manufacturer	Priority	Y2K Status	Intended Approach
COND-CR-1	Condenser Leak Detection Conductivity Recorder, Yokogawa Model 4178-500-32/BU/AK-06/REM, 180-mm Dot Printing Micro Recorder	Critical	Ready	Use as is; adjust dates manually
EMPREP-040-01	Monitor, Ikegami Model C/N-20A	Critical	Comp-liant	To be replaced by new PDIS in Sept. 1999
PRM-XAY-1C	Stack Monitor Multichannel Buffer - Low Range, EG&G Model 921	Critical	Comp-liant	Scheduled for replacement by new computer system
PRM-COMP-3	Stack Monitor Computer System, EG&G	Critical	Sus-pect	Replace
ENV-057	Data Recording System with Software, Telog Instruments, Inc., Model 2400	High	Non-compl-iant	Software up-grade will make the system Y2K compliant.
TSC-RR-1 (ARM-RR-32)	RX BLDG High Range Area RAD Mon Recorder H13-P614, Yokogawa Model 4263 Series	Critical	Comp-liant	None
MS-LR/PR-623A (OG-RR-601)	OG Post Treatment RAD Recorder H13-P600, Yokogawa Model 4263 Series UR100 100T	Critical	Comp-liant	None

DG-SC-GOV/DGI/A14 & DG-SC-GOV/DG2/A14	Diesel Generator Governor Speed Control, Woodward Governor Company, Model 9903-303b Series 2301a	High	Inert	None
RFT-GOV-1A & RFT-GOV-1B	RFW-DT-1A & RFW-DT-1B Governor Lovejoy Controls Corporation Model P&DU	High	Inert	None
COND-LIC	Condenser Hotwell Level Control, Foxboro, MODEL 760CSA-3A, 760CSA-AT, & 760CNA	High	Inert	None
OG-RR-601	OG Post Treatment Rad Recorder H13-P600 (*SC2B)	Critical	Comp-liant	None
RFW-CPU-L010B	RFW GE FANUC 90-70 CPU, General Electric	Critical	Comp-liant	None
RRC-CPU-L04B	Central Processing Unit for PLC B	High	Comp-liant	None

Table 3
Software Assets Reviewed by the Audit Team

Asset Name	Asset Description	Compliance	Priority
Modcomp OS	MAX IV Modcomp Y2K OS Software (SEC-20.0)	Non-compliant	High
Security System Software	WNP-2 Site Security System Software (SEC-20.1)	Non-compliant	High
TADS	Transient Data Acquisition System	Non-compliant	Critical

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Attachment 1

List of Attendees

Entrance Meeting - January 26, 1999

G. L. Gelhaus	WPPSS Y2K Project Manager
D. W. Coleman	WPPSS Manager, Regulatory Affairs
T. W. Myers	WPPSS Y2K Engineer
J. A. McDonald	WPPSS Plant Production Manager
F. K. Butz	WPPSS CIO
D. Maley	WPPSS Embedded Systems Test Lead
Sal Ghbein	WPPSS Plant Modifications
G. W. Ash	WPPSS Business Systems Team Leader
J. D. Carpenter	WPPSS Network Operations
Scott Wood	WPPSS Acting Manager, Technical Services

Robert Brill	NRC/RES Office of Nuclear Regulatory Research
Keith Mortensen	NRC/NRR Instrumentation and Controls Branch
Matthew Chiramal	NRC/NRR Instrumentation and Controls Branch
Fred Schill	WPPSS Licensing
Amanda Barber	WPPSS Acting Quality Manager
Tom Morales	WPPSS Embedded Systems Lead, Y2K
Douglas L. Williams	BPA Nuclear Engineer
Joyce A. Caldwell	LMSI Senior Software Engineer
Eddie E. Tubbs	WPPSS Senior System Analyst
Robert Quay	WPPSS Y2K Project Lead
Dale Atkinson	WPPSS Engineering Manager
Jim Engbarth	WPPSS Quality Supervisor
Paul Inserra	WPPSS Licensing Manager
Scott Oxenford	WPPSS Operations Manager
Tim Messersmith	WPPSS Contingency Planning Lead

Attachment 2

List of Documents Reviewed

NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," dated October 1997

NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," dated August 1998

WPPSS, WNP-2 Year 2000 Project Plan, Revision 1, dated December 1, 1998

WPPSS, WNP-2 Y2K Project, Detailed Assessment Team for Embedded Systems, Desktop Guidelines for Detailed Assessment Packages, Revision 1, Dated November 5, 1998

WPPSS, Procedure Number 8.3.402, Testing of Year 2000 (Y2K) Readiness, Revision 2, Dated December 30, 1998

WPPSS, Instruction Number ENG-DES-26, Year 2000 Readiness Assessment Methodology, Revision 1, Dated October 20, 1998

WPPSS, Procedure Number SWP-CWS-03, Preparing Software Year 2000 (Y2K) Detailed Assessments, Revision 0, Dated December 9, 1998

WPPSS, Y2K Software Assessment Guideline, Revision 1, Dated December 8, 1998

Attachment 3

List of Attendees

Exit Meeting - January 28, 1999

G. L. Gelhaus	WPPSS Y2K Project Manager
D. W. Coleman	WPPSS Manager, Regulatory Affairs
T. W. Myers	WPPSS Y2K Engineer
D. Maley	WPPSS Embedded Systems Test Lead
S. F. Ghbein	WPPSS Plant Modifications
G. W. Ash	WPPSS Business Systems Team Leader
J. D. Carpenter	WPPSS Network Operations
Robert Brill	NRC/RES Office of Nuclear Regulatory Research
Keith Mortensen	NRC/NRR Instrumentation and Controls Branch
Matthew Chiramal	NRC/NRR Instrumentation and Controls Branch
Fred Schill	WPPSS Licensing
A. S. Barber	WPPSS Acting Quality Manager
Tom Morales	WPPSS Embedded Systems Lead, Y2K
Douglas L. Williams	BPA Nuclear Engineer
Joyce A. Caldwell	LMSI Senior Software Engineer
Eddie E. Tubbs	WPPSS Senior System Analyst
Robert Quay	WPPSS Y2K Project Lead
Dale Atkinson	WPPSS Engineering Manager
Jim Engbarth	WPPSS Quality Supervisor
Scott Oxenford	WPPSS Operations Manager
Tim Messersmith	WPPSS Contingency Planning Lead
B. J. Van Erem	WPPSS Procurement Engineering Supervisor
K. Davenport	WPPSS Y2K Admin. Support
A. E. Mouncer	WPPSS General Counsel
R. L. Webring	WPPSS VP, Operations Support/PIO

July 13, 1999

Mr. Gregory M. Rueger
Senior Vice President and General Manager
Pacific Gas and Electric Company
Diablo Canyon Nuclear Power Plant
P. O. Box 3
Avila Beach, CA 93424

SUBJECT: AUDIT REPORT ON THE YEAR 2000 CONTINGENCY PLANNING PROGRAM, DIABLO NUCLEAR CANYON POWER PLANT, UNITS 1 AND 2 (TAC NOS. MA1830 AND MA1831)

Dear Mr. Rueger:

On June 15-17, 1999, the NRC staff conducted an audit of the Year 2000 (Y2K) contingency planning program at the Diablo Canyon Nuclear Power Plant (DCNPP) Units 1 and 2, as a followup to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-1313 if you have any questions or comments on the enclosed audit report.

Sincerely,

Steven D. Bloom, Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosure: Audit Report

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
AUDIT REPORT ON IMPLEMENTATION OF GENERIC LETTER 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-275 and 50-323
License Nos:	DPR-80 and DPR-82

Licensee:	Pacific Gas & Electric Company
Facility:	Diablo Canyon Nuclear Power Plant Power Plant, Units 1 and 2
Location:	Avila Beach, CA
Dates:	June 15-17, 1999
Audit Team Members:	Michael E. Waterman, NRR Mario C. Gareri, NRR José A. Calvo, NRR
Approved by:	José A. Calvo, Chief Electrical & Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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- Report Details
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  - 3.6 Use of AR Relays in the Emergency Power System
  - 3.7 Participation in the North American Electric Reliability Council Drill on September 9, 1999
  - 3.8 NRC Communications Contingency Plan for Year 2000 Rollover
  - 3.9 Security Systems

- 3.10 Remediated Systems Classification
- 3.11 Training
- 4.0 Conclusions

Executive Summary

On June 15-17, 1999, the NRC staff audited the Diablo Canyon Nuclear Power Plant (DCNPP), Units 1 and 2, Year 2000 (Y2K) contingency plan activities. This audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues. The audit team reviewed selected licensee documentation regarding the DCNPP Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

On the basis of the staff's assessment and evaluation of the DCNPP Y2K Readiness Contingency Planning Program, the following observations were made:

1. The licensee for DCNPP, Pacific Gas & Electric Company, has a common Y2K project implementation plan that establishes the scope and control of the Y2K contingency planning at the DCNPP nuclear plants. The Y2K contingency planning is comprehensive and incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."
2. The DCNPP Y2K program is receiving appropriate management support and oversight.
3. The schedule for completing the Y2K readiness contingency planning is tightly controlled, and the two plants should be Y2K ready by June 30, 1999.

Report Details

1.0 Introduction

On June 15-17, 1999, the NRC staff audited the DCNPP Y2K contingency plan activities. This audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for

Contingency Planning," which was based on the NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues. The audit team reviewed selected licensee documentation regarding the DCNPP Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

2.0 Plant Systems Contingency Audits

The staff reviewed contingency plans addressing specific software applications and embedded components (SAECs) in six classes of plant systems: reactor protection system (RPS) and engineered safety features (ESFs), feedwater systems (FWSs) and balance of plant (BOP) systems, radiation monitoring systems (RMSs), emergency notification systems (ENSs), the plant process computer (PPC), and plant security systems (PSSs). The results of these audits are discussed in the following sections.

2.1 RPS/ESF SAEC Contingency Plans

The staff reviewed one contingency plan package in this class of plant systems: Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC) - Record ID 570. The staff found this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.2 FWS/BOP SAEC Contingency Plans

The staff reviewed five contingency plan packages in this class of plant systems: Condensate Polishing System (CPS) Computer System - Record ID 370, Consolidated Fire Alarm System - Record ID 629, DCNPP Plant Information Management System (PIMS) - Record ID 989, DCNPP Public Address System (PAS) - Record ID 1607, and Reactor Coolant Pump Vibration Monitoring System - Record ID 1040. The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.3 RMS SAEC Contingency Plans

The staff reviewed one contingency plan package in this class of plant systems: Emergency Assessment and Response System (EARS/MIDAS) - Record ID 447. The staff found this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.4 ENS SAEC Contingency Plans

The staff reviewed five contingency plans in this class of plant systems: DCNPP Offsite Early Warning Siren System - Record ID 1672, DCCP Paging System - Record ID 1049, DCNPP Phone System - Record ID 1010, Meteorological Data Computer System - Record ID 607, and Voice Automated Notification System (VANS) - Record ID 1367. The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.5 PPC SAEC Contingency Plans

The staff reviewed three contingency plan packages in this class of plant systems: Electronic Document Management System (EDMS) - Record ID 927, Main Annunciator System (MAS) - Record ID 605, and Plant Process Computer - Record ID 532. The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.6 PSS SAEC Contingency Plans

The staff reviewed one contingency plan package in this class of plant systems: Sygnetron Security System (SSS) (ICP #22) - Record ID 1299. The staff found this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.7 Contingency Planning Management

In the area of Contingency Planning Management, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.8 Internal Facility Risk Contingency Plans

In the areas of Contingency Planning for Internal Facility Risks, Event Analyses for Internal Facility Risks, Risk Management for Internal Facility Risks, and Verification for Internal Facility Risks, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.9 External Risk Contingency Plans

In the areas of Risk Identification for External Risks, Event Analysis for External Risks, Risk Notification, Mitigation Strategy Selection, and Verification for External Risks, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.10 Integrated Contingency Plans

In the areas of Integrated Y2K Contingency Plan Development and Integrated Y2K Contingency Plan Content, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

The staff found some inconsistencies between the integrated contingency plan and the individual contingency plans. These inconsistencies indicate that contingency plan verification activities should receive additional attention in the near term and more attention in the long term. The staff discussed this recommendation with the Y2K project manager and concluded from these discussions that the Y2K project manager will be addressing this recommendation.

3.0 Additional Issues

In addition to the contingency planning areas addressed by the Y2K contingency planning checklist, the staff reviewed the issues discussed in the following sections.

3.1 Assumed Duration of Loss of Offsite Power

The licensee's planning assumptions include the possibility of localized power outages of undetermined duration. In the event of complete loss of offsite power, the DCNPP emergency diesel generators will provide power for 7 days while at full load. The licensee's planning window for materials and services is 30 to 60 days.

3.2 Switchyard Battery and Circuit Breaker Auxiliaries

The switchyard battery and circuit breakers are capable of operating for 8 hours. This capability allows sufficient time for obtaining and starting a PG&E-owned generator, which is available at a nearby PG&E warehouse.

3.3 Staffing During Rollover

Staffing details are provided in the DCNPP Y2K contingency plan. The plans include staffing for "workarounds." A summary of planned staffing includes the following:

- Twenty-one normal operations crew, two normal shift control technicians, and two normal firewatch personnel
- Three extra operations personnel
- Two extra shift control technicians
- Two extra firewatch personnel
- Twenty-nine additional (extra) support personnel
- Four additional (extra) personnel in the Emergency Offsite Facility (EOF) and in San Francisco

These 65 personnel do not include additional security personnel for performing manual security system workarounds in the event of loss of the security computer system.

3.4 Y2K Procedures

The Y2K contingency procedures will be approved using the existing plant procedure approval process. One additional temporary procedure (TP TO-9904) has been written for operational management of the date transition.

3.5 Internal and External Communications Contingencies

DCNPP has multiple fully redundant communications capabilities, including internal and external telephone systems, radio systems, cell phones, and satellite phones. The internal telephone system

utilizes a PG&E-owned transport pathway.

The DCNPP Y2K contingency plan includes a second shift of additional maintenance personnel who will report at 10 a.m. on January 1, 2000, unless they are told not to report before that time. Direct access tie-lines are used for emergency communications with the sheriff's department and county emergency services. Use of the 911 emergency phone number is a backup method. In addition, the DCNPP EOF is co-located with the County Emergency Operations Center (EOC) which includes the 911 dispatch center. Also, DCNPP has its own medical facility and fire engine located onsite.

3.6 Use of AR Relays in the Emergency Power System

AR relays are used with the emergency diesel generators. The licensee is familiar with the relay issue at Seabrook and has determined that a similar problem does not exist at DCNPP.

3.7 Participation in the North American Electric Reliability Council Drill on September 9, 1999

The licensee will participate in the North American Electric Reliability Council (NERC) drill on September 9, 1999.

3.8 NRC Communications Contingency Plan for Year 2000 Rollover

The licensee is familiar with the NRC Communications Contingency Plan. In addition, all licensed on-shift operations personnel are receiving this information in the current requalification training cycle.

3.9 Security Systems

The security systems are included in the licensee's contingency plans.

3.10 Remediated Systems Classification

Some remediated systems are not mission-critical systems. Each system was determined to be "mission-critical" on the basis of its function. All mission-critical systems were then included in a risk analysis to determine whether an individual Y2K contingency plan was necessary. The risk analysis used a set of screening criteria to determine whether a Y2K contingency plan was necessary.

3.11 Training

Training is scheduled and some of it has been completed. The schedule is not included as part of the contingency plan. Key training schedule items include:

- April 9, 1999 NERC drill (DCNPP and Company participation)
- May 5, DCNPP tabletop drill and training
- May 7 through June 4, 1999 operator requalification training
- May 26, 1999 Company tabletop drill (C&TS participation only)

- July 13, 1999 Company tabletop drill (DCNPP VP participation)
- August 20, 1999 DCNPP simulator drill (Operations crew)
- August 27, 1999 second DCNPP simulator drill (Operations crew)
- September 9, 1999 NERC drill (DCNPP and Company participation)
- December 1999 date to be determined for additional DCNPP training

4.0 Conclusions

On the basis of the results obtained during the NRC contingency audit, the staff concludes that the licensee's contingency planning activities at DCNPP are acceptable.

July 20, 1999

Mr. Eliot Protsch
President
IES Utilities Inc.
200 First Street, SE
P.O. Box 351
Cedar Rapids, IA 52406-0351

SUBJECT: AUDIT REPORT ON THE YEAR 2000 CONTINGENCY PLANNING PROGRAM, DUANE ARNOLD ENERGY CENTER (TAC NO. MA1834)

Dear Mr. Protsch:

On June 15-16, 1999, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the Year 2000 (Y2K) contingency planning program at the Duane Arnold Energy Center (DAEC) as a follow-up to NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the NRC staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please feel free to contact me at 301- 415-2020 if you have any questions or comments on the enclosed audit report.

Sincerely,

Original signed by:

Brenda L. Mozafari, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-331

Enclosure: As stated

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Audit Report on Implementation of Generic Letter 98-01
"Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

Docket No: 50-331

License No:	DPR-49
Licensee:	IES Utilities, Inc.
Facility:	Duane Arnold Energy Center
Location:	Palo, IA
Dates:	June 15-16, 1999
Audit Team Members:	Deirdre Spaulding, NRR Alvin Bryant, NRR Sikhindra K. Mitra, NRR Joe Giitter, IRO
Approved by:	José A. Calvo, Chief Electrical & Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

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    - 4.2.2 Personnel and Resources Contingency Plan
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- 4.4 Internal and External Communications Contingencies
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- 4.5 Use of AR Relays in the Emergency Power System
- 4.6 Participation in the September 9, 1999 North American Electric Reliability Council (NERC) Drill
- 4.7 NRC Communications Contingency Plan for the Year 2000 Rollover
- 4.8 Security Systems
- 4.9 Remediated Systems Classification and Corresponding Contingency Plan
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Executive Summary

On June 15-16, 1999, the staff of the U. S. Nuclear Regulatory Commission (NRC) conducted an audit of the Year 2000 (Y2K) Readiness Contingency Planning Program at the IES Utilities, Inc. (IES), Duane Arnold Energy Center (DAEC). The audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines: Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG reports. Additionally, the audit addressed emergency generator availability and equipment issues. The audit team reviewed selected licensee documentation regarding the DAEC Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at otherselected plants will be used by the NRC staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

The audit team noted a few editorial inconsistencies in the attachments to the integrated contingency plan. These inconsistencies were discussed with the Y2K project team and resolved before the end of the audit.

On the basis of its assessment and evaluation of the DAEC Y2K Readiness Contingency Planning Program, the audit team concluded that the Y2K Readiness Contingency Planning Program and associated detailed procedures for implementing the program at DAEC are adequate.

Based on the NRC staff's assessment and evaluation of the DAEC Y2K readiness contingency planning program, the following observations were made:

1. The NRC staff found the overall contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The Y2K contingency plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. In the area of contingency planning management, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07. The DAEC Y2K Readiness Contingency Planning Program and associated detailed procedures for implementing the program at DAEC are considered to be adequate.
2. The audit team found that the Y2K program is receiving appropriate management support and oversight. The project is well organized and adequately staffed. The schedule for completing the Y2K readiness contingency planning is tightly controlled, and the plant was expected to be Y2K ready by June 30, 1999.
3. The risk analysis performed provided a detailed and sound basis for the promulgation of the two necessary contingency plans. The audit team noted that the licensee's risk analysis for the individual systems was clear, straightforward, and presented in a manner that was easy to follow.
4. In the areas of development of an integrated Y2K contingency plan and integrated Y2K contingency plan content, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07.
5. In the areas of contingency planning for internal facility risks, event analyses for internal facility risks, and risk management for internal facility risks, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07. In the areas of risk identification for external risks, event analysis for external risks, risk notification, mitigation strategy selection, and verification for external risks, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07.

1.0 Introduction

On June 15-16, 1999, the NRC staff of the NRC conducted an audit of the Y2K Readiness Contingency Planning Program at DAEC. The purpose of the audit was to (1) assess the effectiveness of contingency planning management, development, and integration; (2) evaluate remediation risk, internal facility risk, and external risk to ensure that the licensee's schedule is in accordance with the guidelines of NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," for achieving Y2K readiness by July 1, 1999.

The audit team reviewed the DAEC Y2K Readiness Contingency Plan and associated project documentation and interacted with the DAEC Y2K contingency planning team. The documents reviewed by the audit team are listed in Attachment 1. The audit specifically addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two

nuclear industry guidelines, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues.

The audit process began with an entrance meeting attended by corporate and site management, other plant personnel, the NRC senior resident inspector, and members of the NRC audit team. At the end of the entrance meeting, the licensee's Y2K project manager described the project organization, the project plan, the implementation of the project, and the project's current status. The entrance meeting attendees are listed in Attachment 2.

The project appears to be well organized and adequately staffed. The project organization includes a contingency planning lead as the single point of contact for the contingency planning process. On the basis of the audit team's interaction with the project staff, the audit team considers the licensee's Y2K project staff to be very competent and knowledgeable in the activities they perform. The licensee has shown a considerable amount of ownership of Y2K contingency planning by participating in peer reviews with other nuclear power utilities and industry groups.

The audit activity concluded with an exit meeting in which the audit team summarized the audit results. The exit meeting attendees are shown in Attachment 3.

2.0 Description of the DAEC Y2K Contingency Plan

The "DAEC Year 2000 Project Plan" uses a framework similar to that described in NEI/NUSMG 98-07. The project plan provided guidance for developing the DAEC Integrated Y2K Contingency Plan. The Guideline for Internal Facility Contingency Planning and the Guideline for External Risk Contingency Planning established the scope and method of development of the individual contingency plans. These guidelines are consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The integrated contingency plan was developed from individual contingency plans in the areas of remediation risk, as well as internal facility and external risks, thus providing a comprehensive action plan to mitigate postulated Y2K-induced events that could occur on key rollover dates.

The Duane Arnold Integrated Contingency Plan was compiled in the following manner.

Upon completion of the technical assessment of components and software, an action request (AR) was prepared for those items that required testing or remediation for determining Y2K readiness. The existence of an AR for Priority 2 items was used as the basis for preparing an internal risk analysis. The internal risk analysis evaluated the "consequence of failure risk factor," the "probability of occurrence risk factor," and was used to determine if a contingency plan was required. Likewise, an external risk analysis was prepared for identified external risks. The external risk analysis evaluated the consequence of failure risk factor, the probability of occurrence factor, and was used to determine if a contingency plan was required.

For internal risks, DAEC prepared a risk analysis for all Priority 1 and 2 Y2K susceptible items. Thirty-nine risk analyses were performed. The Y2K DAEC management team reviewed all risk analyses to determine whether a contingency plan was required. Two contingency plans were required: (1) for the

plant process computer and associated software, and (2) for 3D Monicore software.

For external risks, DAEC prepared a risk analysis for all identified external events. Eleven risk analyses were prepared. The Y2K DAEC management team reviewed all risk analysis to determine whether a contingency plan was required. Five contingency plans were required for (1) personnel and resources, (2) loss of telecommunications, (3) loss of offsite power (LOOP), (4) the supply chain, and (5) loss of sewage treatment.

3.0 Contingency Audits

The audit team reviewed in detail seven individual system contingency plans (two for internal facility systems and five related to external risks), the integrated plan, and documents related to the development and implementation of overall contingency management. The audit team also reviewed both internal facility risk and external risk contingency plans. The team met and interacted with the DAEC Y2K staff throughout the review process.

3.1 Plant Systems Contingency Audits

The Y2K Review Checklist for Contingency Planning directs the audit staff to identify and review contingency plans in six classes of internal facility systems: reactor protection system (RPS) and engineered safety features (ESFs); feedwater systems (FWS) and balance of plant (BOP) systems; radiation monitoring systems (RMSs); emergency notification systems (ENSs); the plant process computer (PPC); and plant security systems (PSSs). However, DAEC determined that only two contingency plans were needed for internal facility systems, which were in the area of PPC specific software applications and embedded components (SAECs). For clarity and completeness, all classes of internal systems contingency plans are listed below:

3.2 RPS/ESF SAEC Contingency Plans

None were identified.

3.3 FWS/BOP SAEC Contingency Plans

None were identified.

3.4 RMS SAEC Contingency Plans

None were identified.

3.5 ENS SAEC Contingency Plans

None were identified.

3.6 PPC SAEC Contingency Plans

The NRC staff reviewed two contingency plans in this class of plant systems: (1) DAEC 3D Monicore and PANACEA Software - Package ICPB-25, and (2) DAEC Plant Process Computer - Package ICPB-34. The NRC staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

3.7 PSS SAEC Contingency Plans

None were identified.

3.8 Contingency Planning Management

The DAEC contingency plan incorporates the coordination of a broad range of internal and external resources and interfaces. The DAEC contingency planning management was found to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

3.9 Internal Facility Risk Contingency Plans

For internal risks, DAEC prepared a risk analysis for all priority 1 and 2 Y2K susceptible items. Thirty-nine risk analyses were performed. The Y2K DAEC management team reviewed all risk analyses to determine whether a contingency plan was required. Two contingency plans identified included (1) plant process computer and associated software, and (2) 3D Monicore software.

3.10 External Risk Contingency Plans

The licensee identified external risks related to telecommunications and LOOP that required contingency planning.

DAEC prepared a risk analysis for all identified external events. Eleven risk analyses were prepared. The Y2K DAEC management team reviewed all risk analysis to determine whether a contingency plan was required. Five contingency plans were required: (1) personnel and resources, (2) loss of telecommunications, (3) loss of off-site power, (4) supply chain, and (5) loss of sewage treatment.

Unavailability of Emergency Services

This area of risk deals with the ability of the emergency service providers (fire department, ambulance services, hospitals, local law enforcement) to respond during the Y2K transition. The licensee ranked this area as "medium consequence/medium probability" based on (1) the fact that it has primary and secondary providers of emergency services, and (2) the low likelihood of simultaneous Y2K failures, especially since those providers have their own Y2K programs in place.

The ability to contact the emergency service providers is addressed separately by the telecommunications contingency plan. The licensee did not develop a contingency plan for this area based upon the risk ranking.

The NRC finds this approach reasonable but recommends that the licensee verify that the local 911

centers in Benton and Linn counties are Y2K ready. NRC is aware, through its active involvement in the Emergency Service Sector of the President's Council on the year 2000 Conversion, that a significant portion of 911 centers, (often referred to as public service answering points) may require Y2K remediation efforts.

In the areas of risk identification for external risks, event analysis for external risks, risk notification, mitigation strategy selection, and verification for external risks, the NRC staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

3.11 Integrated Contingency Plans

In the areas of integrated Y2K contingency plan development, and the integrated Y2K contingency plan content, the NRC staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

4.0 Additional Issues

4.1 Assumed Duration of Loss of Offsite Power, Switchyard Battery and Circuit Breaker Auxiliaries Availability

DAEC has a Loss of Offsite Power Contingency Plan.

For planning purposes, the assumed duration of the plan is 24 hours. The restoration of power is documented in the licensee's Power System Restoration Plan. This plan calls for restoring offsite power to DAEC within 4 hours to meet the requirements of the station blackout analysis.

DAEC plans to locate an electrician in the switchyard. This individual will have a radio and an alternative communication device to the phone paging system. Two additional electricians will be available to support the hookup of the temporary diesel generator, if necessary.

4.2 Staffing During Rollover

There are plans to augment the licensee's staff during the rollover. DAEC has a contingency plan which provides a concise method for having sufficient personnel on site. The licensee's augmented staff is referred to as the Y2K Transition Team, and such staffing has been provided in several areas (engineering, operations, security, and licensing).

4.2.1 Personnel and Resources

This area of risk deals with the ability to implement augmented staffing in an emergency. The licensee ranked "personnel and resources" as high consequence/medium probability, primarily because the failure of telecommunication systems would hamper the ability to implement augmented staffing. Based on this ranking, a contingency plan was developed to address how the licensee would ensure that adequate personnel and resources would be available during the Y2K transition.

4.2.2 Personnel and Resources Contingency Plan

The licensee plans to have an augmented staff on site before and during the Y2K transition. These individuals, many of whom are members of the emergency response organization, will supplement the operations crew and support the facility in the event of a Y2K problem. The licensee does not plan to staff every position required for activation of the emergency plan, but is prepared to bring in additional staff using a reverse call-out scheme, if necessary.

4.3 Y2K Procedures

DAEC makes use of existing processes and procedures.

4.4 Internal and External Communications Contingencies

DAEC ranked the telecommunications risk factor as "high consequence/high probability." The high probability ranking was based on the lack of confirmation from some of the telecommunications providers that their networks were Y2K ready. However, both the utility telecommunication systems (microwave and radio) and the local exchange carrier are Y2K ready. Although it is expected that all telecommunications providers to DAEC will be Y2K ready, the licensee prudently assumed that the Y2K readiness status was "indeterminate" for contingency planning purposes. Based on this ranking, the licensee developed a detailed Telecommunications Contingency Plan.

4.4.1 Satellite/GPS

This risk area, which deals with loss of global positioning system (GPS) or satellite equipment, was ranked by the licensee as "medium consequence/low probability." Although DAEC does not use GPS devices, GPS is used in the licensee's energy management systems. The licensee has addressed the GPS issue and the potential rollover problem on August 22, 1999 (a critical GPS date), as part of the corporate Y2K contingency plan.

The licensee relies on satellites for its paging system and as a back-up communications method. Although there is a low probability for a loss of satellites as the result of a Y2K problem, the licensee has addressed in its telecommunications contingency plan how to achieve equivalent functionality in case the satellites are lost. The licensee did not develop a separate contingency plan for this area because it has a low-risk ranking.

4.4.2 Communications - External

This area of risk deals with the ability of the licensee to: (1) provide emergency response data system (ERDS) data to the NRC, and (2) if necessary, contact the Federal Emergency Management Agency (FEMA) on behalf of the Iowa Emergency Management Division. The licensee did not develop a separate contingency plan for this area because of its low consequence/low probability risk ranking; however, the Telecommunication Contingency Plan provides details on how these functions can be accomplished.

4.4.3 DAEC Telecommunications Year 2000 Contingency Plan

This comprehensive plan is intended to provide the user with instructions for various back-up communication options in the event that the primary communications method is inoperable.

The plan addresses the following communication links:

• Communication from DAEC and NRC, including transmission of ERDS

• Communication from DAEC and Linn and Benton Counties

• Communication from DAEC and the Iowa Emergency Management Agency

• Communication from DAEC to the Emergency Operations Facility (EOF)

• Communication from DAEC to plant responders

• Communication from DAEC to the emergency alerting system (WMT Radio)

• Communication from DAEC to radiological survey teams

• Communication from DAEC to emergency service responders (e.g., police, fire, emergency)

• Communication from DAEC to on site personnel

• Communication from DAEC to public via emergency sirens

• Communication from DAEC to Energy transmission system command center.

• Communication from DAEC to the Alliant laboratory used to support radiological consequence assessment (e.g., multichannel analysis)

For each of these communication flows, the contingency plan provides primary, back-up, and alternative backups. For example, the steps for establishing contact with the NRC include: (1) use of the NRC emergency telecommunication system, which is redundant to the public switched network (PSN), (2) use of the PSN via the DAEC PBX and the Palo Phone Cooperative Central Office, (3) use of the corporate microwave system (which does not depend on the DAEC PBX or the Palo Central Office), (4) use of another separate microwave system that can be accessed from a limited number of locations at the plant, (5) use of a limited number of direct lines from the control room to the Palo Central Office that bypass the DAEC PBX, (6) use of a radio system that could be used to contact the Iowa Emergency Management Agency to relay information to the NRC, and (7) use of satellite phone systems located at the utility distribution dispatch center.

Many of the alternative back-up communication links involve the use of radios. The licensee correctly states in the contingency plan that effective use of these radio systems requires frequent training and practice.

DAEC and IES plan a number of Y2K drills that should reinforce the procedures in the telecommunications contingency plan, including the use of radios for back-up communication.

The licensee has back-up emergency power sources for its onsite communication equipment, including its PBX.

4.5 Use of AR Relays in the Emergency Power System

DAEC does not have AR relays.

4.6 Participation in the September 9, 1999 North American Electric Reliability Council (NERC) Drill

DAEC will participate in the September NERC drill.

4.7 NRC Communications Contingency Plan for the Year 2000 Rollover

DAEC is familiar with the NRC's communication contingency plan.

4.8 Security Systems

DAEC does not include the security systems in the contingency plan.

4.9 Remediated Systems Classification and Corresponding Contingency Plan

DAEC prepared two internal contingency plans: DAEC 3D Monicore and PANACEA Software - Package ICPB-25, and DAEC Plant Process Computer - Package ICPB-34.

The risk analysis performed for package ICPB-25 indicated the consequence of failure risk as high. The risk analysis performed for package ICPB-34 indicated the consequence of failure risk as high.

In the case of ERDS software, the risk analysis indicated the consequence of failure risk as high; however, no contingency plan was developed. DAEC has alternate communications methods for providing plant information to the NRC if an emergency condition develops.

4.10 Training

Duane Arnold addresses training in various ways.

Operations staff are continually retrained to ensure that they are prepared to perform their assigned duties. In the third and fourth quarter of 1999, the following activities will occur; general employee awareness training, and training activities for Operations and Emergency Preparedness personnel. During the scheduled operations training in late 1999, the sLOOP event will be stressed to operators. Several drills will be conducted, such as functional drill, full-scale drill, NERC drill, and corporate drills.

5.0 Audit Team Observations

On the basis of the audit team's review of DAEC's Y2K Readiness Contingency Planning Program, the audit team made the following observations:

1. The NRC staff found the overall contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The Y2K contingency plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. In the area of contingency planning management, the NRC staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07. The DAEC Y2K Readiness Contingency Planning Program and associated detailed procedures for implementing the program at DAEC are considered to be adequate.
2. The audit team found that the Y2K program is receiving appropriate management support and oversight. The project is well organized and adequately staffed. The schedule for completing the Y2K readiness contingency planning is tightly controlled, and the plant is expected to be ready by June 30, 1999.
3. The risk analysis performed by the licensee provided a detailed and sound basis for the promulgation of the two necessary contingency plans. The audit team noted that the licensee's risk analyses for the individual systems were clear, straightforward, and easy to follow.
4. In the areas of development of the integrated Y2K contingency plan and the integrated Y2K contingency plan content, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07.
5. In the areas of contingency planning for internal facility risks, event analyses for internal facility risks, and risk management for internal facility risks, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07. In the areas of risk identification for external risks, event analysis for external risks, risk notification, mitigation strategy selection, and verification for external risks, the NRC staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07.

6.0 Conclusion

On the basis of the results obtained during the NRC contingency audit, the NRC staff concludes that the licensee's contingency planning activities are acceptable.

Attachments

Attachment 1

List of Documents Reviewed

DAEC Y2K Project Plan, Rev. 2, February 18, 1999.

DAEC Y2K Integrated Contingency Plan, Rev. 0, June 9, 1999.

Engineering Assessment Report Module -- 2nd Quarter 1999 Y2K Project

Guideline for Internal Facility Contingency Plan, January 15, 1999.

Guideline for External Risk Contingency Plan, January 15, 1999.

Y2K Inventory Items Sorted by Priority, June 15, 1999.

Memo on the DAEC Plant Process Computer Test Results, May 17, 1999.

Memo on the Rod Worth Minimizer Single Test Justification.

ICP-08 Cerberus Pyrotronics XL-3 Fire Dectection Systems - Risk Analysis

ICP-10 NUMAC Rod Worth Minimizer - Risk Analysis

ICP-20 SAIPMS Data Acquisition System (DAS) - Risk Analysis

ICP-25 3D Monicore and PANACEA Software - Risk Analysis

ICP-28 Science Applications International Plant Monitoring System (SAIPMS) - Risk Analysis

ICP-30 Safety Parameter Display System (SPDS) - Risk Analysis

ICP-34 Plant Process Computer (PPC) - Risk Analysis

ICPB-25 3D Monicore and PANACEA Software - Individual Contingency Plan

ICPB-34 Plant Process Computer - Individual Contingency Plan

Attachment 2

List of Attendees - Entrance Meeting

June 15, 1999

Steve Haller	IES	DAEC Y2K Project Manager
David Jantosik	IES	Quality Assurance Manager
Rich Anderson	IES	Manager, Outage and Support
Bob Newell	IES	Corporate Year 2000 Project Manager
Mike McDermott	IES	Manager, Engineering
Kevin Huber	IES	Systems Engineering Manager
Paul Sullivan	IES	Manager, Emergency Planning
Bob Murrell	IES	Regulatory Compliance
Ken Putnam	IES	Manager, Licensing
Rob Anderson	IES	Alliance Implementation Manager
John Franz	IES	Vice President-Nuclear
Nick Brown	IES	Operation Shift Manager
Dave Wilson	IES	Assistant VP-Nuclear

Dennis Lausar	IES	Project Engineering Manager
A. J. Roderick	IES	Principal Mechanical Engineer
Sikhindra Mitra	NRC	Audit Team Member
Alvin Bryant	NRC	Audit Team Member
Deirdre Spaulding	NRC	Audit Team Member
Joe Giitter	NRC	Audit Team Member

Attachment 3

List of Attendees - Exit Meeting

June 16, 1999

Steve Haller	IES	DAEC Y2K Project Manager
David Jantosik	IES	Quality Assurance Manager
Rich Anderson	IES	Manager, Outage and Support
Jonathan Osuch	IES	Y2K Core Team
Steve Carnesi	IES	Y2K Core Team
Ken Nowak	IES	Y2K Core Team rate Year 2000 Project Manager
Mike Fairchild	IES	QA Engineer
Bob Murrell	IES	Regulatory Compliance
Mike McDermott	IES	Manager, Engineering
Lenny Sueper	IES	Licensing
Kevin Williams	IES	Emergency Preparedness
Paul Prescott	NRC	DAEC NRC Senior Resident Inspector
Deirdre Spaulding	NRC	Audit Team Member
Joe Giitter	NRC	Audit Team Member
Alvin Bryant	NRC	Audit Team Member

July 8, 1999

Mr. A. Alan Blind
Vice President, Nuclear Power
Consolidated Edison Company
of New York, Inc.
Broadway and Bleakley Avenue
Buchanan, NY 10511

SUBJECT: AUDIT REPORT ON THE YEAR 2000 CONTINGENCY PLANNING PROGRAM - INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 (TAC NO. MA1846)

Dear Mr. Blind:

On May 18-20, 1999, the U. S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the Year 2000 (Y2K) contingency planning program at the Indian Point Nuclear Generating Unit No. 2 (IP2) as a follow-up to NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-1421 if you have any questions or comments on the enclosed audit report.

Sincerely,

Jefferey F. Harold, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-247

Enclosure: As stated

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION (NRR)
AUDIT REPORT ON IMPLEMENTATION OF GENERIC LETTER (GL) 98-01,
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket No.: 50-247

License No.:	DPR-26
Licensee:	Consolidated Edison Company of New York, Inc
Facility:	Indian Point Nuclear Generating Unit No. 2
Location:	Buchanan, New York
Dates:	May 18-20, 1999
Audit Team Members:	Deirdre W. Spaulding, NRR Hukam C. Garg, NRR
Approved by:	José A. Calvo, Chief Electrical & Instrumentation and Controls Branch Division of Engineering Office of Nuclear Reactor Regulation

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  - 2.2 FWS/BOP SAEC Contingency Plans
  - 2.3 RMS SAEC Contingency Plans
  - 2.4 ENS SAEC Contingency Plans
  - 2.5 PPC SAEC Contingency Plans
  - 2.6 PSS SAEC Contingency Plans
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- 3.10 Remediated Systems Classification
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Executive Summary

On May 18-20, 1999, the NRC staff audited the Indian Point Nuclear Generating Unit No. 2 (IP2), Year 2000 (Y2K) contingency plan activities. The purpose of the audit is to address the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines that were promulgated by the Nuclear Energy Institute (NEI) and the Nuclear Utilities Software Management Group (NUSMG). The guidelines were titled NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues. The audit team reviewed the available licensee documentation regarding the IP2 Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

On the basis of the staff's assessment and evaluation of the IP2 Y2K readiness contingency planning program, the following observations were made:

1. The Y2K contingency planning incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07, and NEI/NUSMG 98-07.
2. The IP2 Y2K program is receiving appropriate management support and oversight.

Report Details

1.0 Introduction

On May 18-20, 1999, the NRC staff audited the IP2 Y2K contingency plan activities. The purpose of this audit was to address the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues. The audit team

reviewed the available licensee documentation regarding the IP2 Y2K readiness program and conducted interviews with the cognizant licensee personnel.

The staff reviewed the limited number of contingency planning packages that the licensee made available. It was found that the licensee had very few systems/components that had Y2K problems. Those systems/components that do have Y2K problems are discussed below.

The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

2.0 Plant Systems Contingency Audits

The staff reviewed contingency plans addressing specific software applications and embedded components (SAEC) in six classes of plant systems: reactor protection system (RPS) and engineered safety features (ESF), feedwater systems (FWS) and balance of plant (BOP) systems, radiation monitoring systems (RMS), emergency notification systems (ENS), the plant process computer (PPC), and plant security systems (PSS). The results of the reviews are discussed in the following sections.

2.1 RPS/ESF SAEC Contingency Plans

The licensee's RPS/ESF is an analog system. Since the system is analog, the licensee made the determination that the Y2K readiness of the system did not need to be evaluated.

2.2 FWS/BOP SAEC Contingency Plans

The staff reviewed the following contingency plans: Containment Building Dew Point Recorder (CP-IP2Y2K-17), Reactor Coolant Pump Stator Winding Recorder (CP-IP2Y2K-12), Gas Turbine Computer (CP-IP2Y2K-41), Spent Fuel Pit Level Monitor (CP-IP2Y2K-48), and Spent Fuel Pool Level Instrument (CP-IP2Y2K-49).

The few inconsistencies found were discussed with Consolidated Edison Company of New York, Inc (Con Ed) for follow-up: (1) Con Ed identified the system engineer only and did not identify the individual person (Con Ed agreed to identify the individual person), (2) Con Ed identified the priority as "2" instead of using the applicable terms in the range from "critical" to "low," for identification, and (3) Con Ed did not identify the existing procedure number or step.

With the exception of these inconsistencies discussed above, the staff found the majority of the aspects of this contingency plan to be consistent with NEI/NUSMG 98-07. Those aspects of the plan that were not consistent will be changed to follow the guidelines.

2.3 RMS SAEC Contingency Plans

No contingency plans were available for review.

2.4 ENS SAEC Contingency Plans

The staff reviewed the following contingency plans: Emergency Planning (CP-EP), and Emergency Response Data System (CP-ERDS).

The staff found the majority of the aspects of these contingency plans to be consistent with NEI/NUSMG 98-07. Those aspects that were not consistent either were minor or will be changed to follow the guidelines.

2.5 PPC SAEC Contingency Plans

The staff reviewed the following contingency plans: Safety Assessment System (SAS) (CP-SAS), Digital Radiation Monitor (DRMS) (CP-DRMS), NPNTLAN, VAX and NT Servers (CP-LAN), Condition Reporting System (CRS) (CP-CRS), and Leak Rate (CP-Leakrate).

In regard to the DRMS, there initially appeared to be contradicting information. The risk mitigation strategy requires additional personnel but resource requirements state "none." This issue was discussed with Con Ed and will be addressed in the final plan.

Aspects of the CRS were discussed and Con Ed indicated that actions associated with risk mitigation strategies do not need to be addressed during key rollover dates and that any problems that arise can be addressed during the normal working hours.

Aspects of the Leak Rate contingency plan were discussed and Con Ed indicated that no resources are required; however, calculations would need to be performed by hand by the designated responsible person. Con Ed was advised to plan for additional resources that are needed to accomplish this task.

2.6 PSS SAEC Contingency Plans

The staff reviewed the contingency plan for the Indian Point Security System (CP-IPSRS), and found the majority of the aspects of this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. Those aspects that were not consistent either were minor or will be changed to follow the guidelines.

2.7 Contingency Planning Management

In the area of Contingency Planning Management, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.8 Internal Facility Risk Contingency Plans

The staff reviewed the following areas: contingency planning for internal facility risks, risk identification for internal facility risks, event analysis for internal facility risks, risk management for internal facility risks, and verification for internal facility risks.

In the area of contingency planning for internal facility risks, the integrated contingency plan is being developed and will address multiple failures of components. In the areas of Contingency Planning for

Internal Facility Risks, Event Analyses for Internal Facility Risks, Risk Management for Internal Facility Risks, and Verification for Internal Facility Risks, the staff determined that the majority of the activities were consistent with NEI/NUSMG 98-07. After discussion with Con Ed, it was determined that when the contingency plan is completed, the applicable internal facility risks will be addressed.

2.9 External Risk Contingency Plans

The staff reviewed the following areas of Contingency Planning for External Risks: risk identification for external risks, event analysis for external risks, risk management for external risks, risk notification, mitigation strategy selection, and verification for external risks.

In the area of Risk Identification for External Risk, information was obtained verbally; nothing in writing was available for review. The staff determined that one licensee Y2K activity may be inconsistent with NEI/NUSMG 98-07. This question pertained to the possible loss of the ultimate heat sink and was discussed with Con Ed. The Hudson River is the ultimate heat sink for IP2, and the continued existence of the Hudson River is not an issue for IP2.

The staff discussed the area of Event Analysis for External Risks and Con Ed indicated that its letter to its vendors incorporates wording which asks the vendors if they have analyzed their supply chain.

The staff discussed the area of Risk Management for External Risks and Con Ed indicated that it had engaged in a dialogue with external organizations. From its discussion with the phone company, Con Ed learned that it should receive a letter of compliance by June 30, 1999. Additionally, Con Ed participated in the April 9, 1999, North American Electric Reliability Council (NERC) drill which focused on communications.

Although there were aspects of Con Ed's contingency plan which initially appeared questionable, after discussion with Con Ed, the staff found the majority of the aspects of the contingency plan for external risk to be consistent with the guidance in NEI/NUSMG 98-07.

2.10 Integrated Contingency Plans

The areas of the integrated contingency plan that were reviewed by the staff were the Integrated Y2K Contingency Plan Development and the Integrated Y2K Contingency Plan Content.

Con Ed has a "Contingency Implementation Plan" which outlines the topics that should be addressed in the "Integrated Contingency Plan." As of the date of the audit, Con Ed had not completed its integrated contingency plan. In the areas of the Integrated Contingency Plan that were reviewed, the staff found that Con Ed's activities were consistent with NEI/NUSMG 98-07. The plan was completed June 30, 1999.

3.0 Additional Issues

In addition to the contingency planning areas addressed by the Y2K contingency planning checklist, the staff reviewed the issues discussed in the following sections.

3.1 Assumed Duration of Loss of Offsite Power

Con Ed's plant technical specifications require a 7-day minimum supply of oil for the emergency diesel generators. Con Ed plans to top off the oil tanks in the middle of December 1999 so that slightly more than 7 days of fuel oil will be available.

3.2 Switchyard Battery and Circuit Breaker Auxiliaries

The switchyard battery and circuit breaker auxiliaries' availability without offsite power is 8 hours. Additionally, the Buchanan substation has available diesel generators.

3.3 Staffing During Rollover

As of the date of the audit, Con Ed had not finalized the staffing for the rollover; however, each plant area of responsibility had provided an estimate of the staffing levels to corporate entities.

3.4 Y2K Procedures

Con Ed makes use of as many of the existing plant procedures as possible. One example of this usage is the existing condition report process. The condition report is a listing of the corrective actions that will take place to address Y2K. For example, one condition report indicates that a checklist is to be developed that will guide a technician in manually rolling the clock forward on the chart recorders.

3.5 Internal and External Communications Contingencies

Con Ed has internal lines that are solely owned and maintained by Con Ed. These lines are Y2K inert.

The following external contingencies planned are: The local government radio, referred to as LGR, is used in the normal emergency plan, and is a ring-down system. Additionally, Con Ed referenced radiology emergency communications (RECs), which allows Con Ed to meet the 15-minute notification requirement.

Con Ed plans to install a satellite phone system to act as a backup system.

3.6 Use of AR Relays in the Emergency Power System

At the time of the audit, Con Ed was not able to provide information on the type of relays used.

3.7 Participation in the September 9, 1999 NERC Drill

Con Ed has plans to participate in the September 9, 1999 NERC drill.

3.8 NRC Communications Contingency Plan for the Year 2000 Rollover

When this topic was discussed with Con Ed, Con Ed indicated that it was not familiar with the NRC

communications contingency plan. The staff stated that this information was on the NRC web site. Con Ed indicated that it plans to obtain this information from the website.

3.9 Security Systems

Con Ed's security system is not included in its contingency plan. According to Con Ed, plant security has existing procedures that address any security problems that the Y2K problem may present.

3.10 Remediated Systems Classification

Each system that has been remediated is not assumed to be a critical system; therefore, each of these systems is not in the contingency plan.

Con Ed has one embedded system that needs to be remediated, and this system will have a contingency plan.

Con Ed has 39 systems that need to be remediated. There are 27 systems (out of the total of 39) that are in the "low/none category" and thus do not need a contingency plan. The other 12 computer systems (out of the total of 39) require a contingency plan.

As part of its existing plant procedures, Con Ed had categories for its computer systems, as defined in the plant administrative procedure, "Computer System Quality Assurance Program." Category B items are important to plant operation and personnel safety; in view of this, these items will have a contingency plan. Category C items have the potential to impact plant operation and personnel safety; in view of this, Con Ed then makes a determination as to which items need a contingency plan.

3.11 Training

The contingency plan refers to training, but no specific Y2K training had been developed or approved at the time of the audit. However, there is existing ongoing training that meets some of the needs for Y2K issues. Additionally, Con Ed's Y2K Contingency Program Plan,

Revision 1, signed May 17, 1999, states, "Activities that will be performed using existing plant procedures may not require any specific training, if the personnel assigned the role to perform the procedure are familiar with it. New procedures shall be implemented with training, as required, to familiarize assigned individuals with the procedure and how it is performed." Furthermore, Con Ed's Y2K Contingency Implementation Plan, Revision 0, signed May 19, 1999, states, "Training will be required for the execution of the integrated contingency plan. As part of the normal operator training prior to a period of vulnerability, the 'Blue Book' and its contents will be presented to the crews who will be on shift during those periods. The goal of this training is to ensure that the crews, senior watch supervisor (SWS), and Y2K watch advisor (YWS) all understand their respective roles, interactions, and responsibilities, as defined in the Blue Book."

4.0 Conclusion

The audit team offered the following suggestions to Con Ed for its consideration:

1. Add a brief discussion in the contingency program plan which addresses staff resource needs for (a) performing any necessary calculations by hand, and (b) handling situations that may arise during the leap year rollover dates.
2. Refer to a specific section of the procedure in the documentation that is provided to the technicians (as opposed to just referring to a voluminous procedure with no clear direction on what portion of the procedure is applicable).
3. For embedded systems only, (a) identify the system engineer and the individual by name; (b) clarify the instances in which Con Ed has identified the priority as "2" instead of using the literal terms which range from "critical" to "low"; (c) identify the procedures referenced by number and step (so that the technician will know which procedure to use and which portion of the procedure to use).

The Y2K contingency planning incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." Although the audit team found that many of the contingency plans had not received final approval by management, the staff concluded that the IP2 Y2K program is receiving appropriate management support.

Attachments

Attachment 1

CONTROL CENTER MEETING

May 17, 1999

NAME	AFFILIATION
Peter Zarakas	CONS-CON Edison
Vid Varneckas	G.M. - Syst Operator
Dom Giangrasso	Sr. Project Mgr - Syst Operator
Ralph Mazzatto	Technical Specialist, Substation Engineer
John Vasco	Section Manager, Substation Engineer
Fehmi Aydin	Section Manager, IP
Rosemarie Sheehy	Y2K Project Manager
Joseph Bahr	Y2K - IP2 Project Manager
Paul Eddy	NYS - PSC

Dierdre Spaulding	US NRC
Jennifer England	US NRC
Hukam Garg	US NRC
Paul E. Peloquin	NYPA - Y2K Project Manager
Harlan R. Sager	Manager - NQA Audit & Surveillance
James Doherty	Area Supervisor - Westchester S/S
Perry Zand	Dept. Manager of Electronic Communications

Attachment 2

NRC Y2K CONTINGENCY PLAN ENTRANCE MEETING

May 19, 1999

NAME	AFFILIATION
R. Allen	NS&L
Mary Ann Wilson	IP#3 EP
John J. Hughes	IP2 EP
Peter Zarakas	IP2 - Y2K
Fehmi Aydin	IP2 - Y2K
Joe Bahr	IP2 - Y2K
Paul Eddy	NYS - PSC
Hukam Garg	NRC - HQ
Dierdre Spaulding	NRC - HQ
Arnoldo Adorno	IP2 - Design Engineer
Rosemarie Sheehy	Y2K Project Mgr - Corp.
Bill Patrick	IP2 - Y2K
John McCann	NS&L
Harlan R. Sager	Con Ed NQA
J.S. Baumstark	Con Ed, VP, NL

Attachment 3

NRC Y2K CONTINGENCY PLAN EXIT MEETING

May 20, 1999

NAME	AFFILIATION
R. Allen	NS&L
Mary Ann Wilson	IP#3 EP
John J. Hughes	IP2 EP
Peter Zarakas	IP2 - Y2K
Fehmi Aydin	IP2 - Y2K
Joe Bahr	IP2 - Y2K
Paul Eddy	NYS - PSC
Hukam Garg	NRC - HQ
Dierdre Spaulding	NRC - HQ
John McCann	NS&L
Harlan R. Sager	Con Ed NQA
J.S. Baumstark	Con Ed, VP, NL
Jennifer England	US NRC
A. Budnick	Con Ed GM QA

July 13, 1999

Mr. W. R. McCollum Jr.
Vice President, Oconee Site
Duke Energy Corporation
P.O. Box 1439
Seneca, SC 29679

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 RE: AUDIT REPORT ON THE YEAR 2000 CONTINGENCY PLANNING PROGRAM, (TAC NOS. MA1863, MA1864, AND MA1865)

Dear Mr. McCollum:

On June 8 and 9, 1999, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the Year 2000 (Y2K) Readiness Contingency Planning Program at the Oconee Nuclear Station, Units 1, 2, and 3, as a follow up to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at, 301-415-1472 if you have any questions or comments on the enclosed audit report.

Sincerely,

David E. LaBarge, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosure: As stated

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
AUDIT REPORT ON IMPLEMENTATION OF GENERIC LETTER 98-01
"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket Nos:	50-269, 50-270, and 50-287
License Nos:	DRP-38, DRP-47, and DRP-55

Licensee:	Duke Power Corporation
Facility:	Oconee Nuclear Station, Units 1, 2, and 3
Location:	Seneca, South Carolina
Dates:	June 8-9, 1999
Audit Team Members:	Matthew Chiramal, NRR Duc T. Nguyen, NRR Barry S. Marcus, NRR Danny E. Billings, Resident Inspector
Approved by:	José A. Calvo, Chief Electrical and Instrumentation and Controls Branch Division of Engineering Office of Nuclear Reactor Regulation

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Executive Summary

On June 8 and 9, 1999, the staff of the U. S. Nuclear Regulatory Commission (NRC) conducted an audit of the Year 2000 (Y2K) Readiness Contingency Planning Program at the Duke Power Corporation's (licensee) Oconee Nuclear Station (ONS), Units 1, 2, and 3. The audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG reports. Additionally, the audit addressed emergency power availability and equipment issues. The audit team reviewed selected licensee documentation regarding the ONS Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

On the basis of its assessment and evaluation of the ONS Y2K Readiness Contingency Planning Program, the audit team makes the following observations:

- The licensee has a Y2K integrated contingency plan, "Oconee Nuclear Station Y2K Event Plan" which establishes the scope and control of the Y2K contingency planning at ONS. The Y2K contingency planning is comprehensive and incorporates the major elements of the nuclear power industry's Y2K guidance contained in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.
- The ONS Y2K contingency planning program is receiving appropriate management support and oversight.
- The ONS supplemental Y2K contingency plans based on the event plan were completed on June 3, 1999.

1.0 Introduction

On June 8 and 9, 1999, the NRC staff conducted an audit of the ONS Y2K contingency planning activities. The basis for this audit was provided in two nuclear industry guidelines, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG documents. This audit addressed the contingency planning activities conducted by the licensee in accordance with their Y2K integrated contingency plan, "Oconee Nuclear Station Y2K Event Plan." The event plan addresses contingency planning activities for ONS components and applications that were identified as part of the ONS Y2K readiness project. Also included are activities for the interfaces external to ONS, including suppliers and supporting organizations and agencies that are critical to the continued operation of ONS. The event plan specifically provides perspective of risks to the facility (internal and external) and resources and staff required to implement identified mitigation strategies. The event plan integrates operational, internal, and external mitigation activities, which are supplemental to the existing approved ONS contingency and emergency procedures and will be in effect for a specified time during the Y2K critical event period. The audit addressed several additional questions dealing with offsite electric grid and onsite emergency power system availability and equipment issues.

The event plan and the 34 ONS supplemental Y2K contingency plans were completed on June 3, 1999. The audit team reviewed the event plan, all of the supplemental contingency plans, and two contingency plan decision packages. The audit team performed detailed audits on the event plan, 17 contingency plans, the 2 contingency plan decision packages, contingency planning management, internal facility risks, and external facility risks.

The audit process began with an entrance meeting attended by the licensee's Y2K project manager, ONS management, other ONS personnel, the NRC resident inspector, and the members of the audit team. The audit activity concluded with an exit meeting in which the audit team summarized the results of the audit. Attachment 1 lists the entrance meeting attendees and Attachment 2 lists the exit meeting attendees.

2.0 ONS Supplemental Contingency Planning

The ONS contingency planning activities followed a four-phase process: identification, impact analysis, plan development, and plan verification.

The identification phase included the consideration of existing contingency and emergency plans, operating procedures and the determination of risks due to dependencies on other cross-functional departments within the corporate organization, such as telecommunication and information management, and due to circumstances, conditions, or events that are not under the direct control of the organization, such as transmission and distribution events and supply chain risks.

The impact analysis and management activities included review of information gathered in the earlier phase, determination of consequence/likelihood and integrated priority of each identified risk, the performance of impact analysis and identification of areas needing Y2K supplemental contingency plans, consideration of possible Y2K event scenarios, performance of critical supplier risk and mitigation strategies, and identification of scope of contingency plans required. The licensee considered, as a

minimum, risks that have priorities A (high consequence/high likelihood), B (high consequence/low likelihood), and C (moderate consequence/high likelihood) for impact analysis and contingency plans.

In the development phase, individual supplemental Y2K contingency plans were developed and training and validation activity schedules were established.

The verification of plans provided confidence in the mitigation strategy and included management and independent assessments and reviews, which documented the approach to testing, training of personnel, and the performance of validation exercises and drills.

2.1 ONS Y2K Contingency Planning Audit

The audit team identified and reviewed contingency plans and contingency plan decision packages addressing specific software applications and embedded components (SAEC) in six classes of plant systems: reactor protection system (RPS) and engineered safety features (ESF), feedwater systems (FWS) and balance of plant (BOP) systems, radiation monitoring systems (RMS), emergency notification systems (ENS), plant process computer (PPC), and plant security systems (PSS). The results of these audits are discussed in the following sections:

2.1.1 RPS/ESF SAEC Contingency Plan Decision Packages

The audit team identified and audited the RPS Analog - Cal Test Computer and Star Modules contingency plan decision package. This system was determined to not have a date function; therefore, a contingency plan was not necessary for this system. The audit team found the contingency plan decision package to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.1.2 FWS/BOP SAEC Contingency Plans and Contingency Plan Decision Packages

The audit team identified and audited one contingency plan decision package and eight contingency plan packages in this class of plant systems: FWS Feedwater Pump Controls (Contingency Plan Decision Package only), BOP Work Control Work Control Work Management System (Contingency Plan CP0080), BOP Work Control Schedules (Contingency Plan CP0081), BOP Work Control Equipment Database (Contingency Plan CP0082), BOP Work Control NuReport (Contingency Plan 0083), BOP Work Control Procedures (Contingency Plan CP0084), BOP Transient Monitor System (Contingency Plan CP0011), BOP Fire Detection System (Contingency Plan CP0016), and BOP Micro-Key Fire Detection System (Contingency Plan CP0057). The Feedwater Pump Controls System was determined to not have a date function; therefore, a contingency plan was not necessary for this system. The audit team found the contingency plan decision package and the above contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.1.3 RMS SAEC Contingency Plans

The audit team identified and audited five contingency plan packages in this class of plant systems: Radiation Monitoring System (Contingency Plan CP0018), Electronic Dosimeter Capture System (Contingency Plan CP0063), RMC Mainframe (Contingency Plan CP0066), Dosimeter Calibrator for Windows (Contingency Plan CP0069), and Contamination Monitor (Contingency Plan CP0040). The audit team found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and

NEI/NUSMG 98-07.

2.1.4 ENS SAEC Contingency Plans

The audit team identified and audited the Siren Controller contingency plan package (Contingency Plan CP0009). The audit team found this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.1.5 PPC SAEC Contingency Plans

The audit team identified and audited the Operator Aid Computer contingency plan package (Contingency Plan CP0059). The audit team found this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.1.6 PSS SAEC Contingency Plans

The audit team identified and audited two contingency plan packages in this class of plant systems: Plant Security System (Contingency Plan CP0129) and Video Badging Network (Contingency Plan CP0128). The audit team found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.1.7 Contingency Planning Management

In the area of Contingency Planning Management, the audit team determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.1.8 Internal Facility Risk Contingency Plans

In the areas of Contingency Planning for Internal Facility Risks, Event Analysis for Internal Facility Risks, Risk Management for Internal Facility Risks, and Verification for Internal Facility Risks, the audit team determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.1.9 External Risk Contingency Plans

In the areas of Risk Identification for External Risks, Event Analysis for External Risks, Risk Notification, Mitigation Strategy Selection, and Verification for External Risks, the audit team determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.1.10 Integrated Contingency Plans

In the areas of Integrated Y2K Contingency Plan Development and Integrated Contingency Plan Content, the audit team determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

3.0 Additional Issues

In addition to the contingency planning areas addressed by the Y2K contingency planning checklist, the staff reviewed the issues discussed in the following sections.

3.1 Assumed Duration of Lost Offsite Power

The licensee's planning assumptions include the possibility of localized power outages of non-determined durations. In the event of a complete loss of offsite power, ONS can be powered from the onsite hydroelectric plant indefinitely. In case of a load rejection, ONS units are capable of running back to house loads without the units tripping.

3.2 Switchyard Battery and Circuit Breaker Auxiliaries

The switchyard battery and circuit breakers are capable of operating for four hours without offsite power. This capability allows sufficient time for obtaining and starting emergency power sources. The circuit breaker auxiliaries are hydraulic and do not use compressed gas.

3.3 Staffing During Rollover

Staffing details are provided in the Y2K contingency plans, which includes staffing for "workarounds." Additionally, the ONS Emergency Response Organization will be staffed through a duty rotation method. Relief shift personnel will be required to report to ONS at specified times, unless notified not to report.

3.4 Y2K Procedures

Existing plant procedures have been identified as adequate for mitigating any Y2K internally induced event. This determination is based on the premise that existing emergency operating procedures are based on a mitigation strategy that is procedurally independent of the initiating event. ONS procedures contain sufficient guidance to ensure mitigation of any reasonable Y2K-related event. The event plan provides specific Y2K mitigation strategies that supplement existing plant procedures.

3.5 Internal and External Communications Contingencies

ONS has multiple fully redundant communications capabilities, including internal and external telephone systems, radio systems, cell phones, and satellite phones. Direct access tie-lines are used for emergency communications with the police department and emergency services. Use of the 911 emergency phone number is a backup method. In addition, ONS has its own emergency medical response team located onsite.

The shifts have been identified and will show up for work without being called. The licensee will set up a "reverse" callout in the event that the notification system is unavailable. The reverse callout requires all affected team members to report to ONS at specified times on January 1, 2000, unless notified not to report.

3.6 Participation in the North American Electric Reliability Council Drill on September 9, 1999

The licensee will participate in the North American Electric Reliability Council drill on September 9, 1999.

3.7 NRC Contingency Plan for Year 2000 Rollover

The licensee is familiar with the NRC Year 2000 Rollover Contingency Plan and the planned communication by the NRC at 15 minutes past midnight on January 1, 2000, to obtain the status of operating plants.

3.8 Security Systems

The security systems are included in the licensee's contingency plans.

3.9 Remediated Systems Classification

Some remediated systems are not mission-critical systems. Those systems that are mission critical and that have been remediated are addressed in the contingency plans and/or use existing procedures.

3.10 Training

The training plans have been identified and the training schedules are included in the contingency plans.

4.0 Additional Audit Team Observations

On the basis of the audit team's review of the ONS Y2K Readiness Contingency Planning Program, the audit team makes the following observations:

4.1 Observation 1

The audit team reviewed the event plan, all 34 of the supplemental Y2K contingency plans, and two contingency plan decision packages. The audit team performed detailed audits of the event plan, 15 of the 17 internal risk contingency plans, two of the 17 external risk contingency plans, and 2 internal risk contingency plan decision packages. The plans and packages are thorough and consistent with NEI/NUSMG 98-07. The Y2K contingency planning program is receiving the appropriate management support and oversight. The event plan and the supplemental Y2K contingency plans were completed on June 3, 1999.

4.2 Observation 2

The audit team traced some of the 182 internal remediation risk candidates through the impact analysis packages, priority assignments, contingency plans, and the event plan. The audit team noticed some

minor inconsistencies between the various documents and the way that priorities were assigned. These differences were based on the judgment of the various system experts. The audit team found some inconsistencies between the event plan and the individual contingency plans and some instances of omitted information and editorial inconsistencies. The licensee plans to complete an internal assessment of the Y2K documentation, which should resolve these and any other such inconsistencies.

5.0 Conclusions

On the basis of the results obtained during the NRC Y2K contingency audit, the audit team concludes that the licensee's Y2K contingency planning activities for ONS are acceptable.

Attachments

Attachment 1

OCONEE Y2K CONTINGENCY PLANNING AUDIT ENTRANCE MEETING

LIST OF ATTENDEES - June 8, 1999

Judith H. Schulte	Duke	Duke Nuclear Y2K Project Manager
Anne Houck	Duke	Duke Nuclear Y2k Contingency Planning Project Manager
Jimmy Jones	Duke	Duke Information Technology
Eddy Fortner	Duke	ONS Site Nuclear Y2K Project Manager
Clay A. Little	Duke	ONS Engineering Manager
Mano Narar	Duke	ONS Engineering Manager
Bill Foster	Duke	ONS Safety Assurance Manager
Ed Burchfield	Duke	ONS Regulatory Compliance Manager
Glenda Johns	Duke	ONS Local Information Technology Manager
Mike Thorne	Duke	ONS Emergency Planning
Larry Nicholson	Duke	ONS Regulatory Compliance
Judy Smith	Duke	ONS Regulatory Compliance
Mike Semmler	Duke	ONS License Renewal
Rounette Nader	Duke	ONS License Renewal
Danny Billings	NRC	Region II Resident Inspector
Ed Girard	NRC	Region II Special Inspection Branch
Matthew Chiramal	NRC	NRR Electrical and Instrumentation and Controls Branch

Duc Nguyen	NRC	NRR Electrical and Instrumentation and Controls Branch
Barry Marcus	NRC	NRR Electrical and Instrumentation and Controls Branch

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Attachment 2

OCONEE Y2K CONTINGENCY PLANNING AUDIT EXIT MEETING

LIST OF ATTENDEES - June 9, 1999

William R. McCollum, Jr.	Duke	Duke ONS Site Vice President
Judith H. Schulte	Duke	Duke Nuclear Y2K Project Manager
Anne Houck	Duke	Duke Nuclear Y2k Contingency Planning Project Manager
Eddy Fortner	Duke	ONS Site Nuclear Y2K Project Manager
Mano Narar	Duke	ONS Engineering Manager
Bill Foster	Duke	ONS Safety Assurance Manager
Ed Burchfield	Duke	ONS Regulatory Compliance Manager
Glenda Johns	Duke	ONS Local Information Technology Manager
Rounette Nader	Duke	ONS License Renewal
Danny Billings	NRC	Region II Resident Inspector
Ed Girard	NRC	Region II Special Inspection Branch
Matthew Chiramal	NRC	NRR Electrical and Instrumentation and Controls Branch
Duc Nguyen	NRC	NRR Electrical and Instrumentation and Controls Branch
Barry Marcus	NRC	NRR Electrical and Instrumentation and Controls Branch

July 8, 1999

Mr. James M. Levine
Senior Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, AZ 85072-3999

SUBJECT: AUDIT REPORT ON THE YEAR 2000 CONTINGENCY PLANNING PROGRAM FOR THE PALO VERDE NUCLEAR GENERATING STATION (TAC NOS. MA1868, MA1869, AND MA1870)

Dear Mr. Levine:

On May 18-20, 1999, the NRC staff conducted an audit of the Year 2000 (Y2K) contingency planning program at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 as a follow-up to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at (301) 415-3062 if you have any questions or comments on the enclosed audit report.

Sincerely,

Mel B. Fields, Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529
and STN 50-530

Enclosure: Generic Letter 98-01 Audit Report

cc w/encl: See next page

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

Audit Report on Implementation of Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

Docket Nos:	STN 50-528, STN 50-529, and STN 50-530
License Nos:	NPF-41, NPF-51, and NPF-74
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	Phoenix, AZ
Dates:	May 18-20, 1999
Audit Team Members:	Mario Gareri, NRR Alvin Bryant, NRR Jerry Mauck, NRR
Approved by:	José A. Calvo, Chief Electrical & Instrumentation and Controls Branch Division of Engineering Office of Nuclear Reactor Regulation

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- Executive Summary
- 1.0 Introduction
- 2.0 Description of the Palo Verde Y2K Contingency Plan
- 3.0 Contingency Audits
  - 3.1 Plant Systems Contingency Audits
  - 3.2 Additional Items
    - 3.2.1 Assumed Duration of Loss of Offsite Power
    - 3.2.2 Running Time and Availability Without Offsite Power of the Switchyard Battery and Circuit Breaker Auxiliaries (i.e., Compressor Gas Supply)
    - 3.2.3 Staffing During Rollover
    - 3.2.4 Y2K Procedures
    - 3.2.5 Internal and External Communications Contingencies
    - 3.2.6 Use of AR Relays in the Emergency Power System
    - 3.2.7 Participation in the North American Electric Reliability Council (NERC) Drill on September 9, 1999
    - 3.2.8 NRC Communications Contingency Plan for Year 2000 Rollover
    - 3.2.9 Security Systems
    - 3.2.10 Remediated Systems Classification
    - 3.2.11 Training
- 4.0 Audit Team Observations
- 5.0 Conclusion

- Attachments

Executive Summary

On May 18-20, 1999, the staff of the U. S. Nuclear Regulatory Commission (NRC) conducted an audit of the Year 2000 (Y2K) Readiness Contingency Planning Program at the Arizona Public Service Company's (APS's) Palo Verde Nuclear Generating Station (Palo Verde), Units 1, 2, and 3. The audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG reports. Additionally, the audit addressed emergency generator availability and equipment issues. The audit team reviewed selected licensee documentation regarding the Palo Verde Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

The audit team noted some instances of omitted information and editorial inconsistencies between individual system contingency plans and the integrated contingency plan. The reviewers noted that these inconsistencies would have been identified by the Quality Assurance (QA) Organization had it been more involved during earlier stages of the development of the Y2K contingency plans. However, these inconsistencies were discussed with the Y2K project team and resolved before the end of the audit. Palo Verde management had also not officially signed the individual and integrated contingency plans at the time of the audit. The licensee plans to have a complete QA review and final plans approved and signed by management before June 30, 1999.

On the basis of its assessment and evaluation of the Palo Verde Y2K Readiness Contingency Planning Program, the audit team concluded that the Y2K Readiness Contingency Planning Program and associated detailed procedures for implementing the program at Palo Verde are adequate. The licensee has a common Y2K project implementation plan which establishes the scope and control of the Y2K contingency planning at the Palo Verde nuclear plants. The Y2K contingency planning is comprehensive and incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The audit team found that the Y2K program is receiving appropriate management support and oversight. The project is well organized and adequately staffed. The successful completion of activities to achieve Y2K readiness by July 1, 1999, appears to be on track.

1.0 Introduction

On May 18-20, 1999, the staff of the NRC conducted an audit of the Y2K Readiness Contingency Planning Program at the APS Palo Verde site. The purpose of the audit was to (1) assess the effectiveness of contingency planning management, development, and integration, and (2) evaluate remediation risk, internal facility risk, and external risk to ensure that the licensee's schedule is in

accordance with NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," guidelines for achieving Y2K readiness by July 1, 1999.

The audit team reviewed the Palo Verde Y2K Readiness Contingency Plan and associated project documentation and interacted with the Palo Verde Y2K contingency planning team. The documents reviewed by the audit team are listed in Attachment 1. The audit specifically addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the two NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues.

The audit process began with an entrance meeting attended by the Palo Verde Y2K project manager, site management, other plant personnel, the NRC senior resident inspector, and members of the NRC audit team. At the end of the entrance meeting, the Y2K project manager described the project organization, the project plan, the implementation of the project, and the project's current status. Attachment 2 lists the entrance meeting attendees.

The project appears to be well organized and adequately staffed. The project organization includes a contingency planning lead as the single point of contact for the contingency planning process. On the basis of the audit team's interaction with the project staff, the audit team considers the Y2K project staff to be very competent and knowledgeable in the activities they perform. The licensee has shown a considerable amount of ownership of Y2K contingency planning by participating in peer reviews with other nuclear power utilities and industry groups.

The audit activity concluded with an exit meeting in which the audit team summarized the results of the audit. Attachment 3 lists the exit meeting attendees.

2.0 Description of the Palo Verde Y2K Contingency Plan

The "Year 2000 Readiness Contingency Planning Guide" uses a framework similar to that described in NEI/NUSMG 98-07. The guide provided guidance for developing the Palo Verde Integrated Y2K Contingency Plan, as well as establishing the scope and method of development of individual contingency plans. These guidelines are consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The integrated contingency plan was developed from individual contingency plans in the areas of remediation risk, internal facility risk, and external risks to provide a comprehensive action plan to mitigate Y2K-induced events that could occur on key rollover dates.

3.0 Contingency Audits

The audit team reviewed in detail 28 individual system contingency plans (22 for specific plant systems and 6 related to external risks), the integrated plan, and documents related to the development and implementation of overall contingency management. The audit team also reviewed internal facility risk contingency plans and external risk contingency plans. The team met and interacted with Palo Verde Y2K staff throughout the review process.

3.1 Plant Systems Contingency Audits

The staff identified and reviewed contingency plans addressing specific software applications and embedded components (SAECs) in six classes of plant systems: reactor protection system (RPS) and engineered safety features (ESFs), feedwater systems (FWS) and balance of plant (BOP) systems, radiation monitoring systems (RMS), emergency notification systems (ENS), the plant process computer (PPC), and plant security systems (PSS). The specific packages reviewed are listed below:

- RPS/ESF SAEC Contingency Plans

  The staff reviewed two contingency plan packages in this class of plant systems: Core Protection Calculator Computer (CPC) [PV-INT-007] and the Control Element Assembly Calculator (CEAC) [PV-INT-027].

- FWS/BOP SAEC Contingency Plans

  The staff identified and reviewed five contingency plan packages in this class of plant systems: Digital Feedwater Control System (DFWCS) [PV-INT-001], Modicon ASCII Module in the Diverse Auxiliary Feedwater Actuation System (DAFAS) [PV-INT-002], Station Blackout (SBO) Gas Turbine Generator (GTG) Components [PV-INT-003], Plant Multiplexer (PMUX) [PV-INT-006], and Water Reclamation Facility (WRF) ICS and Dual UCMs [PV-INT-016].

- RMS SAEC Contingency Plans

  The staff reviewed four contingency plan packages in this class of plant systems: Gaseous Radioactive Effluent Tracking System (GRETS) [PV-INT-013], TLD [Thermoluminescence dosimeter] Recording and Evaluation Computer System (TRECS) [PV-INT-015], Personnel Contamination Monitors (PCMs) [PV-INT-020], and RMS Mini-Computer [PV-REM-003].

- ENS SAEC Contingency Plans

  The staff identified and reviewed five contingency plan packages in this class of plant systems: Emergency Response Facility Data Acquisition and Display System (ERFDADS) [PV-INT-008], EPBX Switchboards [PV-INT-29], Microwave Digital Radio (MDR-4000, MDR-6000) [PV-INT-28a], Meteorological Data Transmission System (MDTS) [PV-REM-002], and Plant Two-Way Radio System (QAG) [PV-INT-028].

- PPC SAEC Contingency Plans

  The staff identified and reviewed five contingency plan packages in this class of plant systems: Plant Monitoring System (PMS) [PV-INT-005], Stator Leak Monitoring System (SLMS) [PV-INT-004], Chemical Laboratory Analysis Storage Systems (CLASS)

[PV-INT-12], Vibration Monitoring System (RCPOVMS) [PV-INT-011], and Vibration and Loose Parts Monitoring System (LPEAC) [PV-INT-010].

• PSS SAEC Contingency Plans

The staff reviewed the contingency plan package for the PSS [PV-INT-009].

3.2 Additional Items

In addition to the contingency planning areas addressed by the Y2K contingency planning checklist, the staff reviewed the items discussed in the following sections.

3.2.1 Assumed Duration of Loss of Offsite Power

The licensee's planning assumptions include the possibility of localized power outages of nondetermined durations. In the event of a complete loss of offsite power, the Palo Verde emergency diesel generators will provide power for 7 days while at full load.

Additionally, the licensee will be watching time zones to the east and will have a representative in Korea (who will observe the performance of a similar Combustion Engineering (CE) reactor during the Y2K transition for that earlier time zone) to anticipate potential problems during the Y2K transition. A Y2K Control Room Communicator will communicate between the Y2K Central Communicator and the Unit 1 control room (Operations). The Y2K Control Room Communicator will keep the Y2K Central Coordinator, by way of the Y2K Central Communicator, informed about plant and electrical grid status and the need for assistance. He will also keep the Operations staff informed of outside information from the Y2K Coordinator. The Y2K Central Communicator remains in the Emergency Offsite Facility (EOF) in contact with CE and the Combustion Engineering Owners Group (CEOG) representatives in Korea, the NRC, and the other nuclear power generation facilities. The Unit 1 Shift Manager, or the Site Manager, will remain the primary source of communication to Units 2 and 3.

3.2.2 Running Time and Availability Without Offsite Power of the Switchyard Battery and Circuit Breaker Auxiliaries (i.e., Compressor Gas Supply)

The switchyard battery is capable of operating for 2 hours and a sufficient compressed gas supply will be available to operate the circuit breakers for approximately 2 days.

3.2.3 Staffing During Rollover

Staffing details are provided in the Y2K contingency plan, which includes staffing for "workarounds." Additional Y2K personnel will be on site to support operation of the Y2K Central EOF. A summary of planned additional on-shift operations personnel includes one senior reactor operator, three reactor operators, and seven auxiliary operators. Additional security officers will also be allocated during the Y2K rollover in the event of any loss of security system functions.

3.2.4 Y2K Procedures

Existing plant procedures have been identified as adequate for mitigating any Y2K internal- induced event. This determination is based on the premise that existing emergency operating procedures are

based on a mitigation strategy that is procedurally independent of the initiating event. Therefore, plant procedures contain sufficient guidance to ensure mitigation of any reasonable Y2K-related event. Furthermore, the Palo Verde Integrated Y2K Contingency Plan provides specific Y2K mitigation strategies that supplement existing plant procedures.

3.2.5 Internal and External Communications Contingencies

Palo Verde has multiple fully redundant communication capabilities, including internal and external telephone systems, radio systems, cell phones, and soon-to-be-added satellite phones. Direct access is available for emergency communications with the police department and emergency services. Use of the 911 emergency phone number is a backup method. In addition, Palo Verde has its own medical facility and fire engine located onsite.

The licensee will set up a "reverse" call-out in the event that the notification system is unavailable. The shifts have been identified and will show up for work without being called (negative callback). The reverse call-out requires all affected team members to report to the Palo Verde site at 2 a.m. on January 1, 2000, unless notified not to report.

3.2.6 Use of AR Relays in the Emergency Power System

The emergency diesel generators at Palo Verde do not use AR relays. The licensee is familiar with the relay issue at Seabrook and has determined that a similar problem does not exist at Palo Verde.

3.2.7 Participation in the North American Electric Reliability Council (NERC) Drill on September 9, 1999

The licensee will participate in the NERC drill.

3.2.8 NRC Communications Contingency Plan for Year 2000 Rollover

The licensee is familiar with the NRC Communications Contingency Plan.

3.2.9 Security Systems

The security systems are included in the licensee's contingency plans.

3.2.10 Remediated Systems Classification

Some remediated systems are not mission-critical systems. Those systems that are mission critical and have been remediated are addressed in contingency plans.

3.2.11 Training

The training plans have been identified and the training schedules are included in the contingency plans.

4.0 Audit Team Observations

On the basis of the audit team's review of Palo Verde's Y2K Readiness Contingency Planning Program, the audit team makes the following observations:

1. In the area of contingency planning management, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.
2. In the areas of contingency planning for internal facility risks, event analyses for internal facility risks, and risk management for internal facility risks, the staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07. However, the staff determined that the verification of internal facility risks was not yet completed. This issue was discussed with the licensee and the verification is expected to be completed by June 30, 1999.
3. In the areas of risk identification for external risks, event analysis for external risks, risk notification, mitigation strategy selection, and verification for external risks, the staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07.
4. In the areas of development of integrated Y2K contingency plan and integrated Y2K contingency plan content, the staff determined that the licensee's Y2K activities were consistent with NEI/NUSMG 98-07. However, the staff noted some minor inconsistencies between the integrated contingency plan and the individual contingency plans. These inconsistencies indicate that contingency plan verification activities should receive additional attention in the near term, and more attention in the long term. The staff discussed this recommendation with the Y2K project manager and concluded from these discussions that the Y2K project manager will be addressing this recommendation. Palo Verde management had also not officially signed the individual and integrated contingency plans at the time of the audit. The licensee plans to have a complete QA review and final plans approved and signed by management prior to June 30,1999.
5. In the areas reviewed for the six classes of plant systems, the staff found the overall contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. However, as previously stated, the audit team noted some instances of omitted information and editorial inconsistencies between some of these individual system contingency plans and the integrated contingency plan. The reviewers noted that these inconsistencies would have been identified by the QA Organization had it been more involved during earlier stages of the development of Y2K contingency plans. Nevertheless, the licensee plans to have a complete QA review before June 30, 1999, which would resolve these and other such inconsistencies.
6. The Palo Verde Y2K Readiness Contingency Planning Program and associated detailed procedures for implementing the program at Palo Verde are considered to be adequate. The licensee has a common Y2K project implementation plan which establishes the scope and control of the Y2K contingency planning at the Palo Verde nuclear plants. The Y2K contingency planning is comprehensive and incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The audit team found that the Y2K program is receiving appropriate management support and oversight. The project is well organized and adequately staffed. The schedule for completing the Y2K readiness contingency planning is tightly controlled, therefore the plants are expected to be ready by June 30, 1999.

5.0 Conclusion

On the basis of the results obtained during the NRC contingency audit, the staff concludes that the licensee's contingency planning activities are acceptable.

Attachments

Attachment 1

List of Documents Reviewed

NAD/Region IV Utilities Y2K Audit: Doc. No. Audit Report 98-2000, dated December 18, 1998.

Palo Verde Y2K Description and Justification of Priority 1-4 Systems Requiring Remediation.

Palo Verde Y2K Project Record, Y2K-EQUIP-CM - EW: Plant Equipment Records.

Palo Verde Y2K Project Record, Y2K-EQUIP-GT: SBO Gas Turbine Generators (GTG).

Palo Verde Y2K Project Record, Y2K-EQUIP-SA: Diverse Auxiliary Feedwater Actuation System (DAFAS).

Palo Verde Y2K Project Record, Y2K-EQUIP-SB: Core Protection Calculators (CPC).

Palo Verde Y2K Project Record, Y2K-EQUIP-SD: Emergency Response Facility Data Acquisition and Display System (ERFDADS).

Palo Verde Y2K Project Record, Y2K-EQUIP-SK: Plant Security System (PSS).

Palo Verde Y2K Results Summary.

Palo Verde Year 2000 Readiness Contingency Planning Guide.

Y2K-Integrated Contingency Plan, Rev. B, dated May 14, 1999.

Y2K Readiness Plan for Palo Verde Rev. 3, Doc. No. Y2K-ADMIN-01.

Y2K Tracker 2000 Database: Doc. No. Y2K-ADMIN-05.

Year 200 Status of Palo Verde Switchyard (Salt Water River Project Switchyard Certification Letter dated April 16, 1999).

Attachment 2

List of Attendees at Entrance Meeting - May 18, 1999

Daniel G. Marks	APS	Nuclear Regulatory Affairs-Compliance, Section Leader
R. Kirk Brewer	APS	Nuclear Regulatory Affairs-Licensing, Sr. Consultant
G. R. Overbeck	APS	Nuclear Productions, Vice President
A. K. Krainik	APS	Nuclear Regulatory Affairs, Department Leader
M. Sontag	APS	Nuclear Assurance, Section Leader
Bill Ide	APS	Nuclear Engineering, Vice President
John H. Hesser	APS	Nuclear Engineering, Director
Martin Grissom	APS	Palo Verde Y2K Contingency Plan Coordinator
Chuck Stevens	APS	Palo Verde Y2K Project Manager
Jim Moorman	NRC	Senior Resident Inspector
Jerry Mauck	NRC/NRR	Electrical & Instrumentation and Controls Branch
Mario Gareri	NRC/NRR	Electrical & Instrumentation and Controls Branch
Alvin Bryant	NRC/NRR	Electrical & Instrumentation and Controls Branch
Fred Swirbul	APS	Palo Verde Y2K, Section Leader
Scott Bauer	APS	Nuclear Regulatory Affairs-Licensing, Section Leader

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Attachment 3

List of Attendees at Exit Meeting - May 20, 1999

Daniel G. Marks	APS	Nuclear Regulatory Affairs-Compliance, Section Leader
Scott Bauer	APS	Nuclear Regulatory Affairs-Licensing, Section Leader
Martin Grissom	APS	Palo Verde Y2K Contingency Plan Coordinator
R. Kirk Brewer	APS	Nuclear Regulatory Affairs-Licensing, Sr. Consultant
Chuck Stevens	APS	Palo Verde Y2K Project Manager
E. J. Gouvier	APS	Design Engineering/Y2K, Sr. Electrical Engineer
Alvin Bryant	NRC/NRR	Electrical & Instrumentation and Controls Branch
Mario Gareri	NRC/NRR	Electrical & Instrumentation and Controls Branch
Jerry Mauck	NRC/NRR	Electrical & Instrumentation and Controls Branch
Jim Moorman	NRC	Senior Resident Inspector
G. R. Overbeck	APS	Nuclear Productions, Vice President
Bill Ide	APS	Nuclear Engineering, Vice President

July 12, 1999

Mr. Thomas F. Plunkett
President, Nuclear Division
Florida Power & Light Company
700 Universe Boulevard
P.O. Box 14000
Juno Beach, FL 33408-0420

SUBJECT: AUDIT REPORT ON THE YEAR 2000 CONTINGENCY PLANNING PROGRAM TURKEY POINT PLANT, UNITS 3 AND 4 (TAC NOS. MA1900 AND MA1901)

Dear Mr. Plunkett:

On May 18-20, 1999, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the Year 2000 (Y2K) contingency planning program at the Turkey Point Plant, Units 3 and 4, as a followup to NRC Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," issued on May 11, 1998. The enclosed report presents the results of the audit. The results of this audit and subsequent audits at other selected nuclear power plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room. Please contact me at 301- 415-1496 if you have any questions or comments on the enclosed audit report.

Sincerely,

Kahtan N. Jabbour, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-250, 50-251

Enclosure: As stated

AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION ON IMPLEMENTATION OF GENERIC LETTER 98-01 "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

DOCKET NOS: 50-250 AND 50-251
LICENSE NOS: DPR-31 AND DPR-41
FLORIDA POWER & LIGHT COMPANY
TURKEY POINT PLANT, UNITS 3 AND 4

- Executive Summary
- Report Details
- 1.0 Introduction
- 2.0 Plant Systems Contingency Audits
  - 2.1 RPS/ESF SAEC Contingency Plans
  - 2.2 FWS/BOP SAEC Contingency Plans
  - 2.3 RMS SAEC Contingency Plans
  - 2.4 ENS SAEC Contingency Plans
  - 2.5 PPC SAEC Contingency Plans
  - 2.6 PSS SAEC Contingency Plans
  - 2.7 Contingency Planning Management
  - 2.8 Internal Facility Risk Contingency Plans
  - 2.9 External Risk Contingency Plans
  - 2.10 Integrated Contingency Plans
- 3.0 Additional Issues
  - 3.1 Assumed Duration of Loss of Offsite Power
  - 3.2 Switchyard Battery and Circuit Breaker Auxiliaries
  - 3.3 Staffing During Rollover
  - 3.4 Y2K Procedures
  - 3.5 Internal and External Communications Contingencies
  - 3.6 Use of AR Relays in the Emergency Power System
  - 3.7 Participation in the North American Electric Reliability Council Drill (NERC) on September 9, 1999
  - 3.8 NRC Communications Contingency Plan for the Year 2000 Rollover
  - 3.9 Security Systems
  - 3.10 Remediated Systems Classification
  - 3.11 Training

- 4.0 Conclusions

Executive Summary

On May 18-20, 1999, the U. S. Nuclear Regulatory Commission (NRC) staff audited the Turkey Point Plant, Units 3 and 4, Year 2000 (Y2K) contingency plan activities. This audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues. The audit team reviewed selected licensee documentation regarding the Turkey Point Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

On the basis of the staff's assessment and evaluation of the Turkey Point Y2K Readiness Contingency Planning Program, the following observations were made:

1. Florida Power & Light Company (FPL/the licensee) has a common Y2K project implementation plan that establishes the scope and control of the Y2K contingency planning at the Turkey Point Plant, Units 3 and 4. The Y2K contingency planning is comprehensive and incorporates the major elements of the nuclear power industry Y2K guidance contained in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.
2. The Turkey Point Y2K program is receiving appropriate management support and oversight.
3. The schedule for completing the Y2K readiness contingency planning is tightly controlled, and the two units should be Y2K ready by June 30, 1999. However, by letter dated June 28, 1999, FPL informed the staff that the date for the two units to be Y2K ready is July 15, 1999.

Report Details

1.0 Introduction

On May 18-20, 1999, the NRC staff audited the Turkey Point 3 and 4 Y2K contingency plan activities. This audit addressed the contingency planning activities for six classes of plant systems, internal facility risks, external risks, and activities that integrated these contingency plans into a single overall plan. The basis for this audit was provided in two nuclear industry guidelines, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The audit guidelines were provided in a checklist format, "Y2K Review Checklist for Contingency Planning," which was based on the NEI/NUSMG reports. Additionally, the audit addressed emergency diesel generator availability and equipment issues.

2.0 Plant Systems Contingency Audits

The staff identified and reviewed contingency plans addressing specific software applications and embedded components (SAECs) in six classes of plant systems: reactor protection system (RPS) and engineered safety features (ESFs), feedwater systems (FWSs) and balance of plant (BOP) systems, radiation monitoring systems (RMSs), emergency notification systems (ENSs), the plant process computer (PPC), and plant security systems (PSSs). The results of these audits are discussed in the following sections.

2.1 RPS/ESF SAEC Contingency Plans

The staff identified and reviewed three contingency plan packages in this class of plant systems: AMSAC CPU B (licensee package number Y2K-093-001) Westinghouse Eagle 21 Protection System (licensee package numbers Y2K-041-003 and Y2K-049-002), and Emergency Bus Load Sequencer (Licensee package number Y2K-024-001). The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.2 FWS/BOP SAEC Contingency Plans

The staff identified and reviewed two contingency plan packages in this class of plant systems: Boric Acid Blend Totalizer for Boric Acid (licensee package number Y2K-046-002), and Boric Acid Blend Totalizer for Primary Water (licensee package number Y2K-046-007). The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.3 RMS SAEC Contingency Plans

The staff reviewed five contingency plan packages in this class of plant systems: Containment Air Monitor 4V36 Control Room Indication (licensee package number Y2K-067-002), Radiation Monitor Spent Fuel Pool Vent Stack (licensee package number Y2K-067-003), Mass Flow Transmitter for Containment Air Monitor 4V36 (licensee package number Y2K-067-009), PRMS SPING/4 Control Cabinet (C212) (licensee package number Y2K-067-012), and Data

Acquisition Module for Main Steam Radiation Monitor RAD-6426 (licensee package number Y2K-067-014). The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.4 ENS SAEC Contingency Plans

The staff reviewed the contingency plans for the emergency sirens. The emergency sirens are controlled by local government agencies, which have contingency plans in place for alternate strategies in the event the sirens do not operate. Consequently, the licensee does not have responsibility for these sirens other than to perform maintenance operations. The local governments are using the contingency plans currently used for hurricanes and other events that could disable the remotely controlled sirens. The staff found this approach to be acceptable.

2.5 PPC SAEC Contingency Plans

The staff identified and reviewed four contingency plan packages in this class of plant systems: QSPDS ICCS Plasma Display A & B (licensee package number Y2K-041-002), reactor coolant pump Temperature Recorders (licensee package number Y2K-041-001), Health Physics Computer System (tracked under a separate project folder), and ERDADS (Emergency Response Data Acquisition and Display System) (licensee package number Y2K-095-001). The staff found these contingency plans to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.6 PSS SAEC Contingency Plans

The staff identified and reviewed one contingency plan package in this class of plant systems: Plant Security Computer System (licensee package number Y2K-SEC-001). The staff found this contingency plan to be consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07.

2.7 Contingency Planning Management

In the area of Contingency Planning Management, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.8 Internal Facility Risk Contingency Plans

In the areas of Contingency Planning for Internal Facility Risks, Event Analyses for Internal Facility Risks, Risk Management for Internal Facility Risks, and Verification for Internal Facility Risks, the staff determined that licensee Y2K activities were consistent with EI/NUSMG 98-07.

2.9 External Risk Contingency Plans

In the areas of Risk Identification for External Risks, Event Analysis for External Risks, Risk Notification, Mitigation Strategy Selection, and Verification for External Risks, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

2.10 Integrated Contingency Plans

In the areas of Integrated Y2K Contingency Plan Development and Integrated Y2K Contingency Plan Content, the staff determined that licensee Y2K activities were consistent with NEI/NUSMG 98-07.

3.0 Additional Issues

In addition to the contingency planning areas addressed by the Y2K contingency planning checklist, the staff reviewed the issues discussed in the following sections.

3.1 Assumed Duration of Loss of Offsite Power

The licensee is part of the Florida Reliability Coordinating Council (FRCC) grid, which has a total capacity of 34 GW, of which 4 GW is generated by nuclear plants. The licensee states that the FRCC goal for restoring power to the grid is 4 hours. The licensee's target for restoring nuclear power is 10 minutes; however, it has generally taken about 30 minutes to restore power. The FRCC nuclear units have first priority for restarting.

3.2 Switchyard Battery and Circuit Breaker Auxiliaries

Two separate battery backups control separate parts of the switchyard. These backups are capable of restoring the switchyard within the required response time.

3.3 Staffing During Rollover

The licensee used the hurricane staffing plans to estimate the required staffing levels for the Y2K rollover. The staffing was modified to reduce emphasis on transmission lines and to increase emphasis on operations. The licensee intends to staff an extra 40 to 60 people at each site during the Y2K rollover. The staff will work in two 12-hour shifts. The relief shift will report for work without prior notification from the plant. The licensee has considered alternate staffing plans. The Nuclear Information Systems Group will staff the plant 24 hours from Friday through Sunday to handle any infrastructure problems.

3.4 Y2K Procedures

The Y2K contingency procedures will be approved using the existing plant procedure approval process. There are special procedures for non-plant systems, such as the passport system (work control).

3.5 Internal and External Communications Contingencies

The licensee assumes in the contingency planning that telecommunications will be available. There are a variety of redundant means for communicating in case the normal system is inoperable. There are three satellite systems available, which are all Y2K compliant. These systems were implemented as a result of Hurricane Andrew, because communications were not available after the hurricane.

As stated in Section 3.3, plant staffing will be automatic. The shifts have been identified and will report for work without being called (negative callback).

ENS sirens are maintained by the Power Delivery Unit (PDU). The county is responsible for activating the sirens, although the licensee is responsible for maintaining the system. Although not part of the Nuclear Division, the PDU uses quality control procedures.

The emergency sirens are redundantly powered and activated and use a battery system with ac charging. The sirens have a feedback system to give report on the operability of the sirens. There is a silent test capability that allows the siren to be tested at 20,000 Hz; however, the sirens are tested at full volume once a quarter, and silently at least biweekly. The licensee maintains the software that controls the sirens. This software was made Y2K ready to allow it to print the correct dates of actuation. The sirens originally reported the date as 1980 when the clock was rolled over. The software is not required to

operate the sirens; it is used for obtaining feedback information. The sirens are radio-activated and are mounted 50 feet above the ground. Sirens report by exception, such that a failed siren reports the failure before the siren receives its next scheduled test. The sirens are electronic rather than mechanical and produce 123 dB at 1600 watts and 100 feet.

The manual backup for the sirens consists of route notification by the local law enforcement agency. The sirens emit a siren wail and a voice notification and may operate for up to 7 days without ac power (20 days of operation are possible). The sirens were used during Hurricane Andrew.

A siren contingency plan for Y2K events was not developed because the existing contingency plan addresses siren failures. Sirens may be remotely monitored for temperature, battery voltage, and status. The licensee replaces the batteries; it does not contract out this task. Extra batteries are available, but they are not on the critical supplier's list because the licensee has a large supply of batteries and batteries are also available through numerous local retail outlets. The sirens are prioritized in the same manner as the sirens of hospitals and critical users. Of the two helicopters used for response to inclement weather, one is used for siren observation. Sirens may be activated from the helicopter. The licensee has extensive experience with the effect of lightning and hurricanes on siren operability.

3.6 Use of AR Relays in the Emergency Power System

AR-D relays are used with the emergency diesel generators. The licensee is familiar with the relay issue at Seabrook in which a relay failed during a periodic diesel generator test. The licensee has determined that a similar problem does not exist at Turkey Point.

3.7 Participation in the North American Electric Reliability Council Drill (NERC) on September 9, 1999

The licensee will participate in the NERC drill on September 9, 1999.

3.8 NRC Communications Contingency Plan for the Year 2000 Rollover

The licensee is familiar with the NRC Communications Contingency Plan.

3.9 Security Systems

Security systems are included in the licensee's contingency plans.

3.10 Remediated Systems Classification

Some remediated systems are not mission-critical systems. Those systems that are mission critical and that have been remediated are addressed in the contingency plans.

3.11 Training

The training plans have been identified and the training schedules are included in the contingency plans.

4.0 Conclusions

On the basis of the results obtained during the NRC contingency audit, the staff concludes that the licensee's contingency planning activities for Turkey Point Units 3 and 4 are acceptable.

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Temporary Instruction 2515/141

REVIEW OF YEAR 2000 (Y2K) READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS

FUNCTIONAL AREA: ENGINEERING (ENG)

APPLICABILITY: All operating power plants

2515/141-01 OBJECTIVES

01.01 To review licensee Y2K program activities that ensure a level of readiness in accordance with GL 98-01 or GL 98-01 Supplement 1 guidelines.

2515/141-02 BACKGROUND

On May 11, 1998, the staff issued GL 98-01 to require licensees to provide information regarding their programs, planned or implemented, to address the Y2K problem in computer systems at their facilities. In the GL, reference is made to NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness" which describes an approach that licensees may utilize to address the Y2K problem at their facilities. This guidance document resulted from a joint effort between the Nuclear Energy Institute (NEI) and the Nuclear Utility Software Management Group (NUSMG).

In addition to NEI/NUSMG 97-07, the licensee received guidance for developing contingency plans for remediated software systems and embedded components, internal events, external events, and for producing an integrated contingency plan. This guidance was provided in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."

The concept of Y2K "readiness" as opposed to "compliancy" is being emphasized with regard to how licensees are addressing their Y2K problems. As indicated in NEI/NUSMG 97-07, 'Y2K Compliant' pertains to an accurate processing of date/time data from, into, and between the twentieth and twenty-first century, the years 1999 and 2000, and leap-year calculations. 'Y2K Ready' pertains to a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the

computer system, application, or device is not fully Y2K compliant.

In September 1998, NRC staff began auditing 12 representative sites to evaluate licensee Y2K programs. The scope of each audit addressed 40-50 software applications and embedded systems and components, licensee contingency planning activities, grid stability issues, and critical supplier issues. The results of these audits were provided to the licensees and were also published for public, licensee, and Congressional review on an NRC website (http://www.nrc.gov/NRC/Y2K/Y2KNRR.html).

In March 1999, following discussions with members of Congress, the Commission expanded the scope of the NRC reviews to include all nuclear power plant sites. Because timeliness of these reviews is critical, the depth of the review activities has been reduced from the scope of the audits conducted at the 12 representative sites to an abbreviated review of licensee Y2K activities. This TI provides guidance to NRC Resident Inspectors and NRC Regional Inspectors regarding the scope of the review activities and reporting requirements.

2515/141-03 REVIEW ACTIVITIES

03.01 Y2K Program. Using the Y2K reviewer's questionnaire (Attachment A), "Y2K Review Checklist," verify the licensee has implemented a Y2K Program that addresses the following areas as suggested in NEI/NUSMG 97-07 and NEI/NUSMG 98-07:

a. Management Planning,

b. Documentation,

c. Implementation Planning,

d. Initial Assessment,

e. Detailed Assessment,

f. Remediation Activities,

g Y2K Testing and Validation,

h. Notification Activities, and

i. Contingency Planning.

2515/141-04 REVIEW GUIDANCE

GENERAL GUIDANCE

Notification of Review. The reviewer should notify the licensee of the onsite review and should confirm that key licensee personnel involved with the Y2K Program will be available.

Document Review. The following reference documents provide guidance to support the Y2K reviews.

a. Generic Letter 98-01 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001.html)
b. Generic letter 98-01, Supplement 1 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001s1.html)
c. NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness" (http://www.nei.org/library/97-07.pdf)
d. NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Contingency Plans" (http://www.nei.org/library/NEI9807.pdf)

Onsite Review. This review should include a review of relevant documentation, and interaction with the plant Y2K project manager. Examples of relevant documentation are: the facility Y2K management plan, implementation plan, inventory listing/database, initial and detailed assessment documents, remediation activity documentation, Y2K testing and validation records, notification documentation, and contingency plans.

SPECIFIC GUIDANCE

04.01 Y2K Program

NEI/NUSMG 97-07 suggests a five phase approach to ensure that a licensee's plant continues to operate safely and within the requirements of their license and NRC regulations. The status of the implementation of these phases and schedules for remaining activities, including planning and coordination of Y2K-related work during currently planned outages, should be examined against the July 1, 1999, Y2K readiness date in GL 98-01. The allocation of resources for completion of the phases should also be reviewed.

The scope of the licensee's Y2K program generally includes all plant software, embedded systems, and interfaces that may be affected by the Y2K problem. The reviewer should confirm that the licensee has included in the inventory and assessment phase a review of embedded software systems. The Y2K program plan should provide appropriate emphasis on safety-related systems/components and systems required for safe operation at the initial and detailed assessment stages via the categorization, classification and prioritization activities of the program.

In addition to the information provided in NEI/NUSMG 97-07, contingency planning, as described in NEI/NUSMG 98-07, should be reviewed. Contingency actions to be taken in the event that unanticipated occurrences or malfunctions occur should be reviewed against the potential concerns identified in the Y2K program.

Contingency planning activities address three types of hazards: 1) remediation hazards, 2) internal hazards, and 3) external hazards. The reviewer should confirm that all three evaluations are considered in the integrated plant Y2K contingency plan.

The reviewer should complete the attached Y2K review checklist, which provides guidelines for the review. Comments regarding

specific questions should be appended to the checklist as appropriate. If the reviewer completes the checklist by hand, the reviewer should transfer the hand-written results to an electronic version of the checklist. This transfer effort will require approximately one hour of additional effort. Consequently, the reviewer should plan his review effort accordingly.

2515/141-05 REPORTING REQUIREMENTS

The reviewer will document the results of the review in the attached Y2K review checklist. The resident's routine inspection report will state that the Y2K TI was completed and include a copy of the "Summary of Checklist Answers" (An example is shown in Attachment B). Since portions of a licensee's Y2K readiness program documentation may be located in the licensee's corporate office, part of the review for one or more plant sites may be conducted at the that location. In these cases, the results of the review effort at the corporate office location should be transferred to the review checklists for each of the affected plant sites.

The completed checklists will be forwarded to the Regional Headquarters, where each will be compiled electronically with other checklists in a summary format. The completed checklists and the resulting summary report will be forwarded to Mr. Matt Chiramal (mxc) at NRC Headquarters in electronic format.

2515/141-06 COMPLETION SCHEDULE

Forward the review checklists to the Regional staff when completed, but no later than June 30, 1999. Each Region shall compile the checklists electronically and forward to Mr. Matt Chiramal (mxc) at NRC Headquarters by July 1, 1999. NRC Headquarters will prepare a report summarizing the review checklist results by July 31, 1999.

2515/141-07 EXPIRATION

This TI will expire on September 30, 1999.

2515/141-08 TECHNICAL CONTACT

Address questions regarding the technical aspects of this TI to Matthew Chiramal, (301) 415-2845 (mxc), or Michael Waterman, (301) 415-2818 (mew1).

2515/141-09 STATISTICAL DATA REPORTING

Direct review effort expended in completing the requirements of this TI is to be charged to TI 2515/141, with Inspection Program Element (IPE) SI.

ORIGINATING ORGANIZATION RESPONSIBILITY

10.01 Organizational Responsibility

This TI was initiated by EEIB/DE/NRR.

10.02 Resource Estimates

All nuclear power plant sites will be reviewed under this TI. For the 12 plant sites that were previously audited by the NRC, this TI will be used for review of the plant-specific Y2K program activities conducted since the audit (i.e., the licensee's assessment activities starting at question 100 and contingency planning activities starting at question 700 in Attachment A).

The resource estimate to complete this TI is 40 hours per review.

10.03 Other. No parallel procedures exist for this TI.

10.03 Training. One day of training is required for this TI.

Attachments:

A. Y2K Review Checklist for Temporary Instruction 2515/141

B. Summary of Checklist Answers

END

NUREG-1706

Year 2000 Readiness in U.S. Nuclear Power Plants

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ABSTRACT

The NRC staff has assessed the year 2000 (Y2K) readiness activities of its nuclear power plant licensees. The staff then integrated those findings with the July 1, 1999, licensee responses to Generic Letter (GL) 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," and licensee followup reports on Y2K readiness. All licensees of NPPs reported in response to GL 98-01, Supplement 1, that there are no Y2K-related problems that directly affect the performance of safety systems. The Nuclear Regulatory Commission has confirmed by onsite reviews that at all 103 U.S. nuclear power plants there are no Y2K-related problems that affect the performance of safety systems needed to safely shut down the plants. As of September 1, 1999, the staff finds that licensees of 75 of the 103 plants have completed all activities to ensure computer systems and digital embedded components that support plant operations are "Y2K ready." Licensees of the remaining 28 plants have additional work to complete on a few non-safety-related systems or components that support plant operations and administrative functions. These licensees submitted dates for completing Y2K readiness at their plants. The staff will verify completion of the remaining Y2K items at each of these 28 plants. Typically, the licensee is completing the remainingY2K work after July 1, 1999, because the work requires a plant outage scheduled for the fall of 1999 or because the licensee is waiting for delivery of a replacement component. All plants are expected to be Y2K ready by December 16, 1999. The staff does not anticipate directing any plant-specific regulatory actions.

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EXECUTIVE SUMMARY

This report provides the status of nuclear power plant (NPP) Year 2000 (Y2K) readiness as of September 1, 1999, and describes NRC's determination of Y2K readiness in operating U.S. NPPs. The staff assessment of Y2K readiness consisted of independently evaluating NPP licensee Y2K readiness program processes, reviewing licensee responses to NRC requests for reporting Y2K readiness, and combining the results on these assessments to achieve assurance that each NPP will operate safely during the transition from 1999 to 2000 and on other Y2K-sensitive dates.

The Y2K computer problem pertains to the potential for date-related problems that may occur in a software system or an embedded digital component. Among these problems are not representing the year accurately, not recognizing leap years, and erroneous date-based or time-based calculations. An example of a date-related problem is interpreting "00" as the year 1900 rather than 2000, which could cause some computer systems to malfunction.

In NPP safety systems and plant operations systems that use software systems or embedded components, the Y2K problem could cause an event that could lead to an NPP shutdown, or could affect systems that either report post-shutdown plant status or that support emergency data collection capabilities. Additionally, to the extent that a Y2K deficiency could cause an NPP shutdown or transient, the resulting loss of electrical generation could introduce an electrical distribution grid instability and a resulting loss of offsite power. Y2K issues also have the potential to affect plant support or administrative systems. Most NPP safety systems that ensure an NPP is maintained in a safe condition are controlled by analog rather than digital systems and, consequently, are not affected by Y2K issues.

Since 1996, the NRC has been working with NPP licensees to ensure that NPP systems are Y2K ready before year 2000. To ensure that licensees of operating U.S. NPPs were aware of the Y2K issue, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the staff described the potential problems that nuclear facility computer systems and software might encounter during the transition from 1999 to 2000.

In 1997, the Nuclear Energy Institute (NEI) took the lead in developing industry-wide guidance for addressing Y2K issues in the nuclear power industry and, with cooperation from the Nuclear Utility Software Management Group (NUSMG), issued NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness." Subsequently, to address contingency planning, NEI and NUSMG issued NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." In Generic Letter (GL) 98-01 and its supplement, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," the NRC accepted the guidance presented in NEI/NUSMG 97-07 as an appropriate methodology for addressing Y2K readiness in NPPs. The staff also determined that the guidance presented in NEI/NUSMG 98-07 was appropriate for developing (1) system Y2K contingency plans, (2) contingency plans for internal facility risks, (3) contingency

plans for external risks, and (4) integrated Y2K contingency plans.

In GL 98-01, the NRC asked all holders of operating licenses for NPPs to tell the NRC about steps they were taking to ensure that computer systems will function properly as 1999 advances to 2000. All licensees responded to GL 98-01, stating that an NRC-accepted program (NEI/NUSMG 97-07) had been adopted, the program addressed both safety-related and non-safety-related systems and components, and the plants would be Y2K ready by 2000. GL 98-01 also required the licensees to confirm that their plants would be Y2K ready, including contingency planning, no later than July 1, 1999. Licensees not Y2K ready by July 1, 1999, were required to submit a status report containing completion schedules for work remaining to be done to confirm their plants would be Y2K ready by 2000.

Beginning in mid-1998, the NRC audited 12 Y2K programs at different NPP sites, which involved 42 of the 103 operating NPPs. The staff did not discover any Y2K issues that would prevent the audited licensees from achieving Y2K readiness. The information obtained during these audits and from other licensees and industry groups indicated that there are no significant Y2K problems in those NPP systems that affect the ability to safely operate and shut down NPPs. However, licensees have discovered Y2K problems in such non-safety-related computer-based systems as security computers, control room display systems, engineering software, control systems, radiation monitoring systems, emergency response systems, and communications systems.

The NRC issued GL 98-01, Supplement 1, in January 1999. Supplement 1 has a broader scope than the original GL 98-01. The supplemental request for information, which was voluntary and also due by July 1, 1999, expanded the scope of the reporting requirements to include systems that are not addressed by the plant license and NRC regulations for safe operations and safe shutdowns, but are necessary for continued plant operations.

In March 1999, the NRC expanded its scope of Y2K readiness program reviews to cover all operating NPP sites. These reviews, which addressed the Y2K readiness programs at all 103 NPPs, were completed by June 30, 1999. The staff evaluated its reviews and scheduled followup reviews for selected plants that were not far enough along in their Y2K readiness preparations at the time of the first NRC staff review.

During May and June 1999, the staff also conducted six detailed audits of licensee contingency planning activities. In these audits, the staff reviewed approximately 15 to 20 licensee system and component contingency plans, contingency plans for internal facility risks, contingency plans for external risks, and the integrated contingency plan (typically, in the 103 NPP reviews, the staff reviewed 6 contingency plans for software or components). The acceptance criteria for these audits were the same as the acceptance criteria used in the 103 NPP reviews (NEI/NUSMG 97-07, “Nuclear Utility Year 2000 Readiness,” and NEI/NUSMG 98-07, “Nuclear Utility Year 2000 Readiness Contingency Planning”). The information obtained during these reviews and audits confirmed that the Y2K readiness programs used for the 103 NPPs are

consistent with industry guidance.

By July 1, 1999, licensees for all 103 operating NPPs reported the status of their Y2K readiness to the NRC. Regarding NRC's highest priority — the uninterrupted performance of NPP safety systems — all licensees reported that Y2K readiness efforts are completed, and that no remaining Y2K-related problems exist that could affect the performance of safety systems or the capability for safely shutting down an NPP. Licensees for 68 of these plants had also completed the next higher order of Y2K readiness as of July 1, 1999, stating that all of their computer systems that support plant operations are Y2K ready. Licensees for the remaining 35 plants reported that, to be fully Y2K ready, additional work would be completed on a few non-safety-related systems or components that support plant operations and administrative functions. Typically, the remaining work to be completed has been scheduled for outages in the fall, or upon delivery of replacement components.

The status of NPP Y2K readiness, including the NPPs that are Y2K ready, is shown in the figure. The solid gray regions of the chart represent the number of NPPs that are already Y2K ready or are scheduled to be Y2K ready on the corresponding date. The diagonally striped regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and that have systems to be remediated that could affect power operations. (Remediation is defined in NEI/NUSMG 98-07 as the process of retiring, replacing, or modifying software or devices that have been determined to be affected by the Y2K problem.) The white regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and whose non-systems could only affect administrative functions at the plant.

The NRC issued a preliminary report on NPP Y2K readiness on July 19, 1999. That report integrated the initial findings of NRC staff reviews of licensee Y2K readiness programs at all 103 NPPs with the licensee responses to GL 98-01, Supplement 1. Most of the NRC onsite reviews of licensee Y2K programs at the 103 NPPs presented sufficient information for the staff to conclude licensee Y2K readiness programs were consistent with staff-acceptable industry guidance. However, the staff could not complete reviews of licensee programs for 14 NPPs because these licensees had not finished some phase of Y2K readiness preparation by the date of the staff's review. The staff conducted followup reviews of these licensees by August 13, 1999. The staff found that in the one case of Cooper Nuclear Station (CNS), the licensee had not completed its integrated contingency plan (ICP) by July 1, 1999 (CNS safety-related systems are Y2K ready), although CNS had been previously listed as Y2K ready. The staff has added this licensee to its list of licensees to be tracked through completion of their Y2K readiness program.

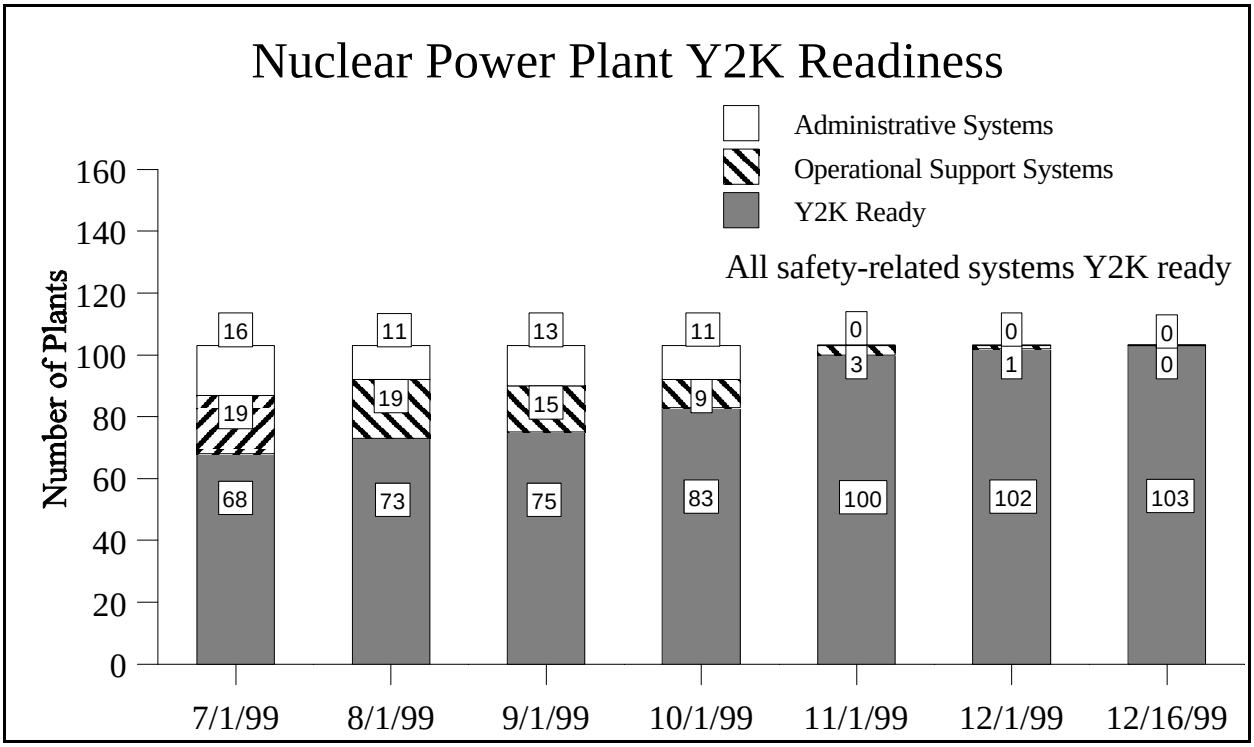
Additionally, during a planned audit of its NPP Y2K inventory, the licensee for CNS discovered three components that were improperly addressed by its contractor. One component was in an operational support system and had been incorrectly classified as Y2K compliant when it was actually Y2K ready. The other two components were measurement and test equipment (administrative support systems). None of these components involved systems needed to

safely shut down the plant. The licensee is performing additional audits of its NPP Y2K inventory, and is developing a plan of action, which the NRC will monitor.

The NRC also reviewed Y2K readiness activities at the 21 decommissioned U.S. NPPs. The staff concluded that licensees of the decommissioned NPPs will be Y2K ready by the end of 1999. A detailed discussion of the results of these reviews is outside the scope of this status report.

As of September 1, 1999, the staff concludes the following: (1) there are no Y2K concerns that could affect the performance of safety systems, (2) licensees for all 103 NPPs are following NRC-acceptable industry guidance for achieving Y2K readiness, (3) 75 NPPs are Y2K ready, (4) 28 NPPs are not Y2K ready, and (5) the completion schedules for the few remaining non-safety-related items that remain not Y2K ready will be finished before the transition from 1999 to 2000. The NRC staff will verify completion of licensee readiness activities as they are finished.

The NRC believes that licensees will be able to operate all 103 NPPs safely during the transition from 1999 to 2000, and does not anticipate the need to direct any significant plant-specific regulatory actions.



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Many NRC staff helped develop the guidance used for reviewing licensee Y2K programs, helped with the initial reviews and followup reviews of licensee Y2K programs, and helped prepare this report. The following people made significant contributions to this report. Many other NRC staff were generous with their experience and guidance; and without them this report could not have been prepared.

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ABBREVIATIONS

ARERAS	atmospheric radioactive effluent release assessment system
BIOS	basic input output system
CNS	Cooper Nuclear Station
ERDS	emergency response data system
ERFCS	emergency response facility monitoring and trending computer system
FDAS	fire detection and alarm system
GENE	General Electric Nuclear Energy
GL	generic letter
ICP	integrated contingency plan
ICS	integrated computer system
IN	Information Notice
MAS	main annunciator system
MIDAS	meteorological information and dispersion system
NEI	Nuclear Energy Institute
NPP	Nuclear Power Plant
NRC	Nuclear Regulatory Commission
NUSMG	Nuclear Utility Software Management Group
PBAPS	Peach Bottom Atomic Power Station
RMS	radiation monitoring system
SECY	Letter from NRC staff to Commission
SPDS	safety parameter display system
SRM	staff requirements memorandum
TI	temporary instruction
Y2K	Year 2000

1 INTRODUCTION

This report presents the status of Year 2000 (Y2K) activities at the 103 operating U.S. nuclear power plants (NPPs) as of September 1, 1999. The status was determined by integrating the results of NRC staff reviews of licensee responses to Generic Letter (GL) 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," with the findings of regional staff reviews conducted at each NPP site.

The regulatory framework regarding issues such as enforcement policy and NRC contingency actions to support the transition from 1999 to 2000 will be addressed in a supplement to this report.

NRC regional staff conducted reviews of licensee Y2K activities at each NPP site following the guidance of Temporary Instruction (TI) 2515/141, "Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants." NRC staff reviews verified that licensees were implementing Y2K programs and processes consistent with the industry guidance in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," both of which have been found acceptable by the staff. Additionally, the NRC received responses to GL 98-01, Supplement 1, from licensees of all 103 operating NPPs.

The staff incorporated these two sources of information regarding Y2K readiness into this report. Followup activities and the scheduled completion dates for the NPPs not yet declared to be fully Y2K ready are also presented here.

In Section 2, "Background," the staff summarizes the nature of the Y2K problem, the history of NRC activities related to resolution of this problem in the nuclear power industry, and the scope of activities conducted by the staff to verify that plants will be Y2K ready before the end of 1999. In Section 3, "Review and Integration Approach," the staff describes the methodology it used to perform onsite reviews of licensee Y2K activities for each of the 103 NPPs and the methodology it used to integrate the results of these reviews with the licensee responses to GL 98-01, Supplement 1. In Section 4, "Review Results," the staff summarizes the findings of its reviews of licensee Y2K program activities and the licensee responses to GL 98-01, Supplement 1, and lists the scheduled completion dates for the plants not yet declared Y2K ready. In Section 5, "Future Activities," the staff describes the activities it will perform in the months between September 1999 and March 2000. In Section 6, "Conclusions," the staff presents its conclusions about Y2K readiness in U.S. NPPs.

2 BACKGROUND

The Y2K computer problem pertains to the potential for date-related problems that may arise in a software system or an embedded digital component. Among these problems are not representing the year properly, not recognizing leap years, and erroneous date-based or time-based calculations. An example of a date-related problem is reading ”00" as the year 1900 rather than 2000, which could cause some computer systems to malfunction. A software system or an embedded digital component that is determined to be “Y2K compliant” accurately processes date and time data (including calculating, comparing, and sequencing data) from, into, and between the years 1999 and 2000. A software system or an embedded digital component that is determined to be “Y2K ready” performs its functions correctly, although the system or component is not Y2K compliant.

In NPP safety systems and plant operations systems that use software systems or embedded digital components, the Y2K problem could cause an event that could lead to an NPP shutdown, or could affect systems that either report post-shutdown plant status or that support emergency data collection capabilities. Additionally, to the extent that a Y2K deficiency could cause an NPP shutdown or transient, the resulting loss of electrical generation could introduce an electrical distribution grid instability and a resulting loss of offsite power. Y2K issues can also affect plant support or administrative systems. Most NPP safety systems are controlled by analog systems and, consequently, are not affected by Y2K issues.

A timeline of significant NRC Y2K regulatory activities is presented in Figure 1. Since 1996, the NRC has been working with NPP licensees to ensure that NPP systems are Y2K ready before 2000. To ensure that licensees of operating U.S. NPPs were aware of the Y2K issue, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the staff described the potential problems that nuclear facility computer systems and software might encounter during the transition from 1999 to 2000. The NRC sent copies of this information notice to all U.S. NPP licensees, fuel cycle facility licensees, and nuclear materials licensees.

In 1997, the Nuclear Energy Institute (NEI) took the lead in developing industry-wide guidance for addressing Y2K issues in the nuclear power industry and, with cooperation from the Nuclear Utility Software Management Group (NUSMG), issued NEI/NUSMG 97-07. Subsequently, in August 1998, NEI and NUSMG issued NEI/NUSMG 98-07. In GL 98-01 and its supplement, the NRC accepted the guidance presented in NEI/NUSMG 97-07 as appropriate methodologies for addressing Y2K readiness in NPPs.

In GL 98-01, the NRC requested that all holders of operating licenses for NPPs inform the NRC of steps they were taking to ensure that computer systems will function properly by 2000. Every licensee responded to GL 98-01, stating that an NRC-accepted program (NEI/NUSMG 97-07) had been adopted, the program addressed both safety-related and non-safety-related systems and components, and the plants would be Y2K ready by 2000. GL 98-01 also required the

licensees to confirm that their plants would be Y2K ready, including contingency planning, no later than July 1, 1999. Licensees that were not Y2K ready by July 1, 1999, were required to submit a status report containing completion schedules for work remaining to be done, to confirm their plants would be Y2K ready by 2000.

Beginning in September 1998, the NRC audited 12 Y2K programs at different NPP sites, which involved 42 of 103 operating NPPs. The staff did not discover any Y2K issues that would keep the audited licensees from achieving Y2K readiness. The information obtained during these audits and from other licensees and industry groups indicated that, in those NPP systems, significant Y2K problems do not exist that affect the ability to safely operate and shut down NPPs. However, licensees have discovered Y2K problems in non-safety-related computer-based systems, such as security computers, control room display systems, engineering software, control systems, radiation monitoring systems, emergency response systems, and communications systems.

The NRC issued Supplement 1 to GL 98-01 in January 1999. The scope of this supplement was broader than the scope of the original GL 98-01. The supplemental request for information, which was voluntary and also due by July 1, 1999. expanded the scope of the reporting requirements to include systems that are not addressed by the plant license and NRC regulations but are necessary for continued plant operations.

In March 1999, the NRC expanded its scope of Y2K readiness program reviews to cover all 103 operating NPPs. These reviews, addressing the Y2K programs for 103 NPPs, were completed by June 30, 1999. As described in Section 4, the staff evaluated the reviews and conducted followup reviews for selected plants that had not sufficiently completed Y2K readiness preparations at the time of the site reviews.

During May and June 1999, the staff also conducted six detailed audits of licensee contingency planning activities. In these audits, the staff reviewed approximately 15 to 20 licensee system and component contingency plans, contingency plans for internal facility risks, contingency plans for external risks, and the integrated contingency plan (typically, in the reviews, the staff reviewed six contingency plans for software or components). The acceptance criteria for these audits were the same as the acceptance criteria used in the 103 NPP reviews (NEI/NUSMG 97-07, Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning").

Additionally, during May 1999, the NRC staff developed an interim enforcement policy in SECY 99-135, "Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition." The Commission reviewed the interim enforcement policy, and presented guidance for its implementation in a staff requirements memorandum (SRM) dated July 8, 1999, "Staff Requirements – SECY 99-135 –Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition." This interim policy is discussed in Section 5.

On June 22, 1999, in SECY-99-162, "Policy

for Regulatory Actions for Licensees of Nuclear Power Plants That Have Not Completed Year 2000 Readiness Activities," the NRC staff proposed a policy for regulatory actions it would take for licensees of nuclear power plants that had not completed their Y2K readiness activities (including remediation and contingency planning) by July 1, 1999. This policy is also discussed in Section 5.

By July 1, 1999, the staff had received responses to GL 98-01, Supplement 1, from licensees of all 103 operating NPPs. As described in Section 4, the staff reviewed these responses and integrated the findings of these reviews with the findings of the staff's onsite reviews of licensee Y2K readiness programs. Between September 1999 and December 1999, the staff will continue to review the remaining licensee Y2K activities as they are completed. These activities are discussed in Section 5.

The staff also addressed decommissioned NPPs and concluded that the licensees of the 21 decommissioning nuclear power plants are implementing Y2K activities that address equipment and systems important to safety, so that there is reasonable assurance of adequate protection to public health and safety. A complete discussion of the status of the inspection activities for decommissioned plants is outside the scope of this report. The sections that follow address Y2K readiness in the 103 U.S. operating NPPs.

1996 - May 1998	• IN 96-70, "Year 2000 Effect on Computer System Software" • NEI/NUSMG 97-07, “Nuclear Utility Year 2000 Readiness” • Work with nuclear industry
May 1998	• GL 98-01, “Year 2000 Readiness of Computer Systems at Nuclear Power Plants”
June - July 1998	• NRC Y2K audit plan
August 1998	• NEI/NUSMG 98-07, “Nuclear Utility Year 2000 Readiness Contingency Planning” • First licensee responses to GL 98-01
September 1998	• Audits of 12 licensee Y2K readiness programs started
January 1999	• Audits of 12 licensee Y2K readiness programs completed • GL 98-01, Supplement 1
March 1999	• Temporary Instruction (TI) 2515/141, “Review of Year 2000 (Y2K) • Readiness of Computer Systems at Nuclear Power Plants”
April 1999	• Staff Training for TI 2515/141 • Y2K readiness reviews of all 103 operating NPPs started • IN 99-12, "Year 2000 Computer Systems Readiness Audits"
May 1999	• Audits of six licensee Y2K contingency plans started • SECY 99-135, “Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition”
June 1999	• Y2K readiness reviews of all 103 operating NPPs completed • Audits of six licensee Y2K contingency plans completed • SECY-99-162, “Policy for Regulatory Actions for Licensees of Nuclear • Power Plants That Have Not Completed Year 2000 Readiness Activities”
July 1999	• Licensee responses to GL 98-01, Supplement 1 • Preliminary report on NPP Y2K readiness • Followup reviews of Y2K readiness at 14 NPPs started • SRM for SECY 99-135
August 1999	• SRM for SECY 99-162 • Follow-up reviews of Y2K readiness at 14 NPPs completed
September 1999	• NUREG-1706, “Year 2000 Readiness in U.S. Nuclear Power Plants” • NRC decision on need to order plant-specific Y2K actions • Reviews of Y2K activities at NPPs
October - December 1999	• NRC and industry Y2K exercise • Reviews of Y2K activities at NPPs • NRC Y2K contingency plan for December 31, 1999, to January 1, 2000
January 2000	• Y2K status report
February - March 2000	• NRC Y2K contingency plan for February 28 to March 1, 2000

Figure 1. NRC Activities Related to NPP Y2K Readiness

3 REVIEW AND INTEGRATION APPROACH

This section describes the methodology used by the NRC staff to conduct Y2K reviews at each of the103 operating NPP sites, and to integrate the review findings with the licensee responses to GL 98-01, Supplement 1.

3.1 Site Review Methodology

The NRC reviews at each NPP site focused on the process followed by the licensees to achieve Y2K readiness to ensure these processes were consistent with the guidance presented in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. The staff offered review guidance in Temporary Instruction (TI) 2515/141, "Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants." This TI is available on the NRC web site <http://www.nrc.gov>. The TI guidance contained 452 acceptance criteria that were based on guidance presented in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. To guide the staff reviewers, the review criteria in the TI were arranged in a checklist format. The staff selected this format to ensure that the reviews would be comprehensive and conducted consistently at each NPP site. Additional guidance for applying the acceptance criteria was presented to NRC reviewers in training sessions and in telephone calls between the reviewers and NRC headquarters staff.

The acceptance criteria were divided into three major areas of Y2K readiness activities: (1) planning and initial assessment, (2) detailed assessment, and (3) contingency planning. These three major areas are further subdivided into more specific areas of acceptance criteria as follows:

Planning and Initial Assessment
- Management Planning
- Documentation
- Implementation Plans
- Initial Assessment

Detailed Assessment
- System/Component Detailed Assessment
- System/Component Remediation
- System/Component Testing and Validation
- System/Component Notification

Contingency Planning
- System/Component Contingency Planning
- Contingency Planning for Internal Facility Risks
- Contingency Planning for External Risks
- Integrated Contingency Planning

To review detailed assessment activities, the staff selected one system or a component from each of the following six plant system classes:
- Reactor Protection System and Engineered Safety Features System (including emergency diesel generators)
- Feedwater System and Balance of Plant Systems
- Radiation Monitoring Systems
- Emergency Notification Systems
- Plant Process Computer Systems
- Plant Security Systems

These six classes of plant systems were chosen to ensure that the NRC staff could review any system or component during the

plant onsite reviews, thereby allowing the staff to assess the full scope of each licensee's Y2K readiness program. Remediation is defined in NEI/NUSMG 98-07 as the process of retiring, replacing, or modifying software or devices that have been determined to be affected by the Y2K problem.

The staff used the findings to determine the adequacy of each licensee's Y2K readiness program with regard to consistency with industry guidelines. Upon receipt of the licensee's response to GL 98-01, Supplement 1, the staff used its assessment of the licensee's program to gain assurance about the quality of the licensee's Y2K readiness activities. This integration process is summarized next.

3.2 Integration Process

The staff followed a three-step process to attain assurance of licensee Y2K readiness. The first step involved onsite reviews of licensee Y2K readiness activities using the acceptance criteria checklist described in Section 3.1. The second step involved a review of licensee responses to GL 98-01, Supplement 1, which were received by July 1, 1999. The final step involved integrating the findings of these first two steps to determine licensee Y2K readiness and the need for regulatory followup actions. The integration process of the third step is discussed in Section 4.

In the first step, the NRC staff reviewed Y2K readiness programs and implementation progress at each of the 103 operating NPPs. Because of the timing of the onsite reviews, the staff expected to find instances of incomplete Y2K readiness. Each review involved discussions with the licensee's Y2K technical staff and reviews of licensee documents and work practices.

To ensure consistency in the reviews, the staff developed acceptance criteria in the form of a 452-question checklist, which is described in Section 3.1. NRC staff reviewers completed these checklists and forwarded them to the headquarters staff for evaluation and integration with the licensee responses to GL 98-01, Supplement 1.

In the second step, NRC staff reviewed licensee responses to GL 98-01, Supplement 1. In these responses, licensees noted the expected completion date of their Y2K readiness program and, if the completion date extended beyond July 1, 1999, their schedule for completing Y2K readiness activities.

In the third step, the NRC staff reviewed the acceptance criteria checklists prepared by the NRC staff reviewers and integrated the results of these reviews with the licensee responses to GL 98-01. The results of this integration process appear in the next section.

4 REVIEW RESULTS

This section summarizes the staff's reviews of all 103 operating NPPs, and integrates the review findings with the licensee responses to GL-98-01, Supplement 1.

4.1 Assessment of NPP Licensee Y2K Programs

As described in Section 3.1, the staff reviewed licensee Y2K program implementations at all 103 operating NPP sites between April 1999 and July 1999. In some cases, the staff performed reviews before the licensees had completed all phases of their Y2K programs. For example, many licensees had not planned to complete integrated contingency planning activities until late June 1999, but the staff reviewed their Y2K program implementation in May or early June. Consequently, these licensees could not provide the staff with sufficient information at the time of the initial review for the staff to conclude that the licensee's integrated contingency planning process was consistent with industry guidance.

The staff found that of the 103 operating NPPs 14 required additional followup reviews to evaluate more fully each phase of the licensee's Y2K program. The staff conducted followup reviews between July 1 and August 13, 1999, and addressed only those portions of the applicable TI 2515/141 acceptance criteria that the staff could not evaluate during the its initial review, or that required additional clarification regarding the manner of implementing certain Y2K activities. Specifically, the staff reviewed detailed assessment activities and contingency planning activities at eight NPPs, only detailed assessment activities at two NPPs, and only contingency planning activities at four NPPs. The staff performed followup reviews at the following NPPs:

- Arkansas Nuclear One, Units 1 and 2
- Beaver Valley Power Station, Units 1 and 2
- Cooper Nuclear Station
- Grand Gulf Nuclear Station, Unit 1
- Indian Point, Unit 2
- Prairie Island Nuclear Generating Plant, Units 1 and 2
- River Bend Station, Unit 1
- Three Mile Island Nuclear Station, Unit 1
- Vermont Yankee Nuclear Power Station
- Virgil C. Summer Nuclear Station, Unit 1
- Waterford Steam Electric Station, Unit 3

In 13 of the 14 reviews, the staff was able to conclude that the licensee programs were consistent with industry guidance.

In reviewing the integrated contingency planning activities at Cooper Nuclear Station (CNS), the staff determined that the licensee's integrated contingency plan (ICP) was not sufficiently complete to conclude that CNS was fully Y2K ready, although all safety-related systems and components were Y2K ready. The licensee presented a date of September 20, 1999, for completing the ICP. The staff will review the CNS ICP upon its completion.

Additionally, during a planned audit of its NPP Y2K inventory, the licensee for CNS discovered that three items had not been

adequately assessed. The first item was a radiation monitor that was incorrectly classified as Y2K compliant, but was only Y2K ready and still performed its operational function. The second item was a device used for testing batteries and had been classified as not Y2K compliant; however, the replacement component was also not Y2K compliant, although the battery tester was Y2K ready. The third item was a device used for testing that was omitted from the licensee's Y2K database. This device was not included in their inventory database because it is only used as a backup calibration device in case other calibration devices fail. None of these components involved systems needed to safely shut down the plant, and did not change the licensee's Y2K status, as previously reported to the NRC. The licensee is performing additional audits of its NPP Y2K inventory, and is developing a plan of action, which the NRC will monitor.

NEI provides guidance to the industry for ongoing maintenance of Y2K readiness. The staff is working with NEI to address situations where a licensee or vendor discovers that a system or embedded digital component that was thought to be Y2K ready is found to have a Y2K deficiency. The staff and industry are considering configuration management issues regarding systems and embedded digital components so that the staff can gain confidence that the industry is confirming through ongoing processes that unexpected Y2K problems are addressed and that generic information is shared in a timely manner.

On the basis of the results of the completed reviews for all 103 operating NPPs, the staff concluded that all licensees were implementing Y2K programs that were consistent with the NRC-approved industry guidance.

Using the information gained from the staff assessments of licensee Y2K programs (including the TI 2515/141 followup reviews described above), the staff reviewed the licensee responses to GL 98-01, Supplement 1, to find areas requiring additional staff followup actions and reviews. The results of this assessment are described in the next section.

4.2 Review of Licensee Responses to GL 98-01, Supplement 1

The licensee responses to GL 98-01, Supplement 1, indicated that all NPP safety-related systems are Y2K ready. Safety-related systems are those systems required for shutting down a plant and maintaining the plant in a safe shutdown state.

The licensee responses also indicated that, as of July 1, 1999, licensees for 35 of the 103 operating NPPs had additional work to complete on a few non-safety-related operational support and administrative support systems or devices to be fully Y2K ready. The licensees submitted schedule completion dates for these systems and components. Typically, the remaining work has been scheduled for outages in the fall, or upon delivery of replacement components.

Operational support systems are non-safety related systems that support electrical power generation. For example, a feedwater control system is a non-safety-related system that supports power generation. Some of these systems may be required to be operable as a condition of the plant license or as a result of a regulatory commitment, but are not relied

upon to maintain the plant in a safe condition.

Administrative support systems are non-safety-related systems that support administrative functions at the plant. For example, a meteorological system that produces plant environmental information, and a system for tracking personnel radiation exposures are administrative support systems. These systems are non-safety-related and generally are used to facilitate activities such as recording personnel activities and qualifications, maintaining equipment inventory records, and archiving records of plant operations.

4.2.1 NPP System Y2K Readiness

For plants that are not Y2K ready, the total number of operational support systems and administrative support systems that have not been remediated are shown in Figure 2. In this figure, the number of operational support systems that are scheduled to become Y2K ready are shown in the diagonally striped regions on the chart. The number of administrative support systems that are scheduled to become Y2K ready are shown in the white regions on the chart.

Included in the operational support systems is the CNS ICP that the staff determined during a follow-up review was not completed by July 1, 1999 (see discussion about CNS in Section 4.1). The staff, therefore, added this licensee to the staff's list of licensees to be tracked through completion of their Y2K readiness program.

The number of operational support systems that are scheduled to become Y2K ready remains nearly constant during July and August, decreasing from 28 systems on July 1, 1999, to 21 systems on September 1, 1999. Between September 1 and November 1, 1999, the number of operational support systems that are scheduled to be Y2K ready decreases by 16 systems. Of the remaining five systems on November 1, 1999, four systems are scheduled to become Y2K ready during November 1999 (three systems in Salem Nuclear generating Station, Unit 1; and one system in Comanche Peak Steam Electric Station, Unit 1). The remaining system is the Joseph M. Farley Nuclear Plant, Unit 2, digital electrohydraulic controller, which is discussed in Section 4.2.2.

As shown in Figure 2, the number of administrative support systems that are scheduled to be remediated decreases from 32 systems on July 1, 1999, to 16 systems on October 1, 1999. The remaining 16 systems are scheduled to be remediated during October 1999. This trend reflects licensee activities being scheduled for fall outages and software upgrade schedules.

4.2.2 NPP Y2K Readiness

The number of NPPs expected to be Y2K ready as a function of date are shown in Figure 3. The gray regions of the chart represent the number of NPPs that are already Y2K ready or are scheduled to be Y2K ready on the corresponding date. The diagonally striped regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date and have operational support systems to be remediated. The white regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and that have only administrative support systems to be remediated.

NPPs that have both operational support systems and administrative support systems to be remediated are counted with the NPPs that have only operational support systems to be remediated. As the remediation activities on the operational support systems with both types of systems are finished, these NPPs are reclassified as NPPs with only administrative support systems. These changes are shown on Figure 3 as increases in the number of NPPs that have only administrative support systems to be remediated.

As shown in Figure 3, the number of plants not Y2K ready remains relatively constant during the summer months, when peak electrical loads on the electrical distribution grids are typically highest. Because of the high demands for electrical power during the summer months, licensees usually schedule NPP refueling outages for the fall. Between July 1 and October 1, 1999, the number of NPPs scheduled to become Y2K ready increases by 15 NPPs from the July 1, 1999, value of 68 NPPs to the October 1, 1999, value of 83 NPPs. During October 1999, another 17 NPPs are scheduled to become Y2K ready. Two of the remaining three NPPs that will not be Y2K ready at the end of October 1999 are scheduled to become Y2K ready in November 1999: Comanche Peak Steam Electric Station, Unit 1, and Salem Nuclear Generating Station, Unit 1.

The last NPP (Joseph M. Farley Nuclear Plant, Unit 2) is scheduled to become Y2K ready by December 16, 1999. This NPP will be in an outage between October 16 and December 16, 1999. During this outage, the licensee will install a Y2K-ready turbine digital electrohydraulic controller on the main turbine. The licensee does not plan to restart from the outage until this modification is completed. This system has been installed and operated at Joseph M. Farley Nuclear Plant, Unit 1. Additionally, the licensee has prepared contingency plans and will have a manufacturer representative on site during critical Y2K rollover periods. Consistent with the pattern of Y2K remediation activities indicated in Figure 3, most of the remediation activities will be performed in the fall of 1999 during NPP outages.

Table 1 lists each NPP, the associated licensee, and either the Y2K readiness status or the licensee's expected date for becoming Y2K ready. As shown in this table, as of September 1, 1999, licensees of 75 NPPs have reported they are Y2K ready. More specific details regarding the remaining 28 NPPs appear in Table 2.

Table 2 lists the NPPs that licensees reported were not Y2K ready; a brief description of each system not Y2K ready, potential consequences and licensee actions if the Y2K vulnerability were to remain uncorrected and the system was to fail because of a Y2K-related failure; and the licensee's scheduled date for finishing remediation of each system. None of the remaining Y2K readiness work in the NPPs affects the ability of a plant to shut down safely, if necessary. As noted in Figures 2 and 3, all safety-related systems in the 103 NPPs are Y2K ready.

For NPP licensees that have not finished their Y2K activities, the staff will monitor licensee actions and verify the completion of Y2K activities as described in Section 5.

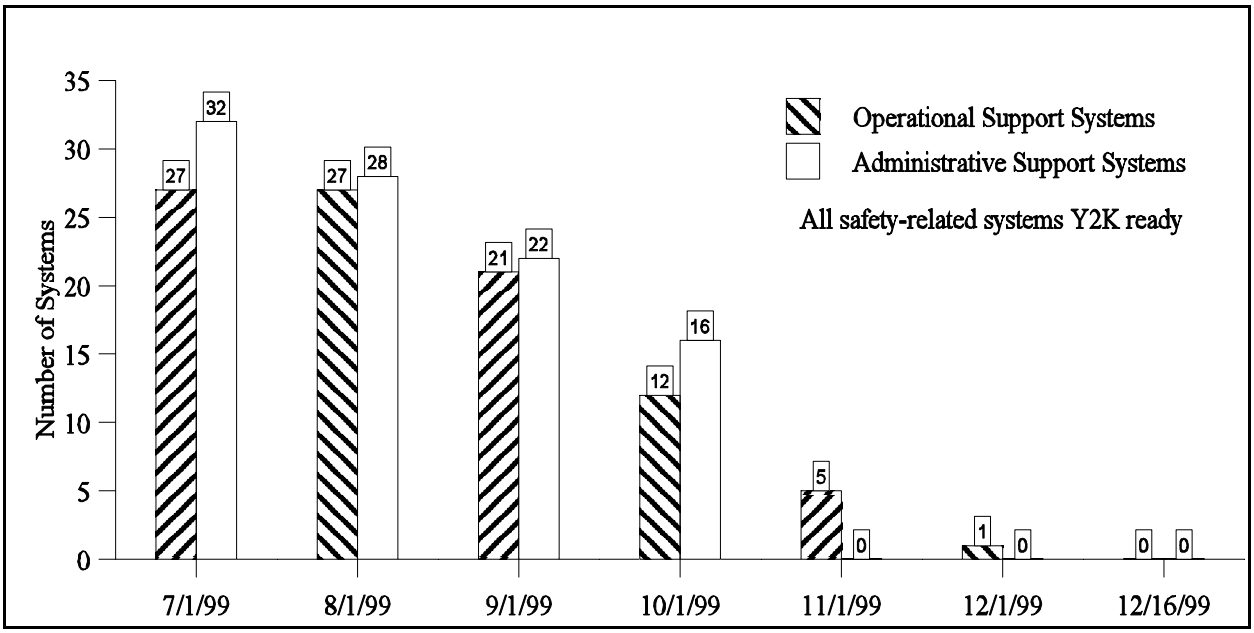

Figure 2. Systems and Components Remaining to be Remediated

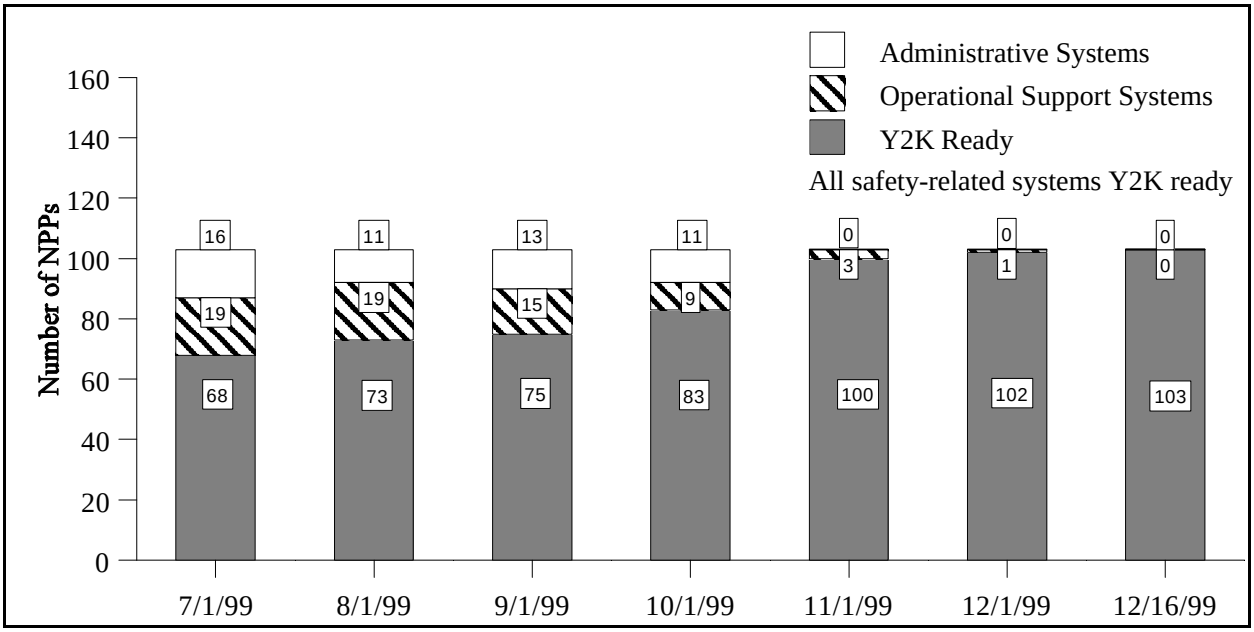

Figure 3. Status of NPP Y2K Readiness

5 FUTURE ACTIVITIES

In May 1999, the NRC staff developed an interim enforcement policy in SECY 99-135, "Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition." In SECY-99-135, the staff sought the Commission's approval to revise the NRC enforcement policy for NPPs to add an interim policy to exercise enforcement discretion for noncompliance with license conditions, including technical specifications, during theY2K transition or rollover periods. The Commission reviewed the interim enforcement policy, and presented guidance for its implementation in a staff requirements memorandum (SRM) dated July 8, 1999, "Staff Requirements – SECY 99-135 –Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition." The NRC published the interim enforcement policy in the Federal Register in July 1999. The staff is implementing procedures for this policy and is assigning appropriate staff as part of the NRC's contingency planning effort.

The staff continues to monitor licensee progress, and will verify the Y2K readiness of each system and embedded digital component as they are finished. The staff will discuss these verification activities in inspection reports.

On June 22, 1999, in SECY-99-162, "Policy for Regulatory Actions for Licensees of Nuclear Power Plants That Have Not Completed Year 2000 Readiness Activities," the NRC staff proposed a policy for regulatory actions it would take for licensees of NPPs that had not completed their Y2K readiness activities (including remediation and contingency planning) by July 1, 1999. The proposed policy addressed NRC commitments to Congress that the agency would assess licensees' Y2K preparedness and determine the need for plant-specific regulatory action, up to and including the issuance of shutdown orders. The proposed policy supplemented NRC Y2K contingency plans and the NRC's policy on enforcement discretion for Y2K-related issues, which was described in SECY-99-135.

The Commission approved the proposed policy with supplemental guidance in an SRM dated August 5, 1999, "Staff Requirements – SECY-99-162 –Policy for Regulatory Actions for Licensees of Nuclear Power Plants That Have Not Completed Year 2000 Readiness Activities." The guidance required that the staff take regulatory actions, where appropriate, sufficiently in advance of the Y2K rollover date (i.e., as soon as September 30, 1999, but no later than December 1, 1999) to ensure that plants are in a safe, stable state during the Y2K transition. Additionally, the staff will provide current and projected completion dates for Y2K readiness.

The staff will continue to monitor licensee schedules reported in their GL 98-01 responses and will determine whether additional actions are required. On the basis of current licensee schedules for finishing Y2K activities, the staff does not anticipate directing plant-specific actions.

Additionally, the staff will maintain a web site, <http://www.nrc.gov> , to keep the public abreast of all activities related to NPP Y2K readiness. The web site will include the staff's assessment of each site that is not fully Y2K ready. The NRC will also issue press

releases concerning NPP Y2K readiness at appropriate intervals.

In October 1999, to validate NRC and industry contingency plans, the NRC and industry will conduct a Y2K exercise that simulates various failures during the transition from 1999 to 2000. The NRC staff will incorporate lessons learned from this exercise into its Y2K contingency plan.

The NRC will implement the contingency plan and augment the staff in the NRC Emergency Response Center during the critical date rollovers on December 31, 1999, to January 1, 2000; and February 28 to March 1, 2000.

The staff will prepare a final Y2K status report in January 2000. This status report will summarize the activities performed by the staff and industry between September 1, 1999, and January 1, 2000.

6 CONCLUSIONS

As of September 1, 1999, the staff concludes (1) no Y2K concerns remain that could affect the performance of safety systems, (2) licensees for all 103 NPPs are following NRC-acceptable industry guidance for achieving Y2K readiness, (3) 75 NPPs are Y2K ready, (4) 28 NPPs are not Y2K ready, and (5) the completion schedules for the remaining few non-safety-related items that are still not Y2K ready will be accomplished before the transition from 1999 to 2000. The NRC staff will verify completion of licensee readiness activities as they are completed.

The NRC believes that licensees will be able to operate all 103 NPPs safely during the transition from 1999 to 2000, and does not anticipate the need to direct any significant plant-specific actions.

Table 1 NPP Y2K Readiness Status as of September 1, 1999		
NPP Name	**NPP Licensee**	**Readiness Status/Date***
Arkansas Nuclear One, Units 1 and 2	Entergy Operations, Inc.	Y2K Ready
Beaver Valley Power Station, Units 1 and 2	Duquesne Light Company	9/30/99
Braidwood Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Browns Ferry Nuclear Power Station, Units 2 and 3	Tennessee Valley Authority	10/31/99
Brunswick Steam Electric Plant, Units 1 and 2	Carolina Power and Light Company	Y2K Ready
Byron Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Callaway Plant, Unit 1	Union Electric Company	Y2K Ready
Calvert Cliffs Nuclear Power Plant, Units 1 and 2	Baltimore Gas and Electric Company	Y2K Ready
Catawba Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Clinton Power Station, Unit 1	Illinois Power Company	9/22/99
Comanche Peak Steam Electric Station, Unit 1	Texas Utilities Electric Company	11/30/99
Comanche Peak Steam Electric Station, Unit 2	Texas Utilities Electric Company	10/30/99
Cooper Nuclear Station	Nebraska Public Power District	9/20/99
Crystal River Unit 3 Nuclear Generating Plant	Florida Power Corporation	Y2K Ready
Davis-Besse Nuclear Power Station, Unit 1	First Energy Services Corporation	Y2K Ready
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Pacific Gas and Electric Company	10/31/99
Donald C. Cook Nuclear Plant, Units 1 and 2	Indiana Michigan Power Company	10/30/99
Dresden Nuclear Power Station, Units 2 and 3	Commonwealth Edison Company	Y2K Ready
Duane Arnold Energy Center	IES Utilities, Inc.	Y2K Ready

Table 1 NPP Y2K Readiness Status as of September 1, 1999 (continued)		
NPP Name	**NPP Licensee**	**Readiness Status/Date***
Edwin I. Hatch Nuclear Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Enrico Fermi Atomic Power Plant, Unit 2	Detroit Edison Company	Y2K Ready
Fort Calhoun Station, Unit 1	Omaha Public Power District	Y2K Ready
Grand Gulf Nuclear Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
H. B. Robinson Plant, Unit 2	Carolina Power and Light Company	Y2K Ready
Hope Creek Nuclear Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	10/29/99
Indian Point Unit No. 2	Consolidated Edison Company of New York, Inc.	Y2K Ready
Indian Point Station, Unit 3	Power Authority of the State of New York	Y2K Ready
James A. FitzPatrick Nuclear Power Plant	Power Authority of the State of New York	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 1	Southern Nuclear Operating Company, Inc.	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 2	Southern Nuclear Operating Company, Inc.	12/16/99
Kewaunee Nuclear Power Plant	Wisconsin Public Service Corporation	Y2K Ready
LaSalle County Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Limerick Generating Station, Unit 1	PECO Energy Company	Y2K Ready
Limerick Generating Station, Unit 2	PECO Energy Company	9/30/99
Millstone Nuclear Power Station, Units 2 and 3	Northeast Nuclear Energy Company	Y2K Ready
Monticello Nuclear Generating Plant	Northern States Power Company	Y2K Ready
Nine Mile Point Nuclear Station, Units 1 and 2	Niagara Mohawk Power Corporation	Y2K Ready
North Anna Power Station, Unit 1	Virginia Electric and Power Company	Y2K Ready

Table 1 NPP Y2K Readiness Status as of September 1, 1999 (continued)

NPP Name	NPP Licensee	Readiness Status/Date*
North Anna Power Station, Unit 2	Virginia Electric and Power Company	10/29/99
Oconee Nuclear Station, Units 1, 2, and 3	Duke Energy Corporation	Y2K Ready
Oyster Creek Nuclear Generating Station	GPU Nuclear Corp.	9/30/99
Palisades Nuclear Plant	Consumers Energy Company	Y2K Ready
Palo Verde Nuclear Generating Station, Units 1, 2, and 3	Arizona Public Service Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 2	PECO Energy Company	9/30/99
Peach Bottom Atomic Power Station, Unit 3	PECO Energy Company	10/31/99
Perry Nuclear Power Plant, Unit 1	First Energy Nuclear Operating Company	Y2K Ready
Pilgrim Nuclear Power Station, Unit 1	Boston Edison Company	Y2K Ready
Point Beach Nuclear Plant, Units 1 and 2	Wisconsin Electric Power Company	Y2K Ready
Prairie Island Nuclear Generating Plant, Units 1 and 2	Northern States Power Company	Y2K Ready
Quad Cities Nuclear Power Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
River Bend Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
Robert Emmet Ginna Nuclear Plant, Unit 1	Rochester Gas and Electric Corp.	Y2K Ready
Salem Nuclear Generating Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	11/6/99
Salem Nuclear Generating Station, Unit 2	Public Service Electric and Gas Co. of New Jersey	10/29/99
San Onofre Nuclear Generating Station, Units 2 and 3	Southern California Edison Company	Y2K Ready
Seabrook, Unit 1	North Atlantic Energy Service Corporation	Y2K Ready

* All safety-related systems are Y2K ready

Table 1 NPP Y2K Readiness Status as of September 1, 1999 (continued)		
NPP Name	**NPP Licensee**	**Readiness Status/Date***
Sequoyah Nuclear Plant, Units 1 and 2	Tennessee Valley Authority	10/31/99
Shearon Harris Nuclear Power Plant, Unit 1	Carolina Power and Light Company	Y2K Ready
South Texas Project Electric Generating Station, Units 1 and 2	South Texas Project Nuclear Operating Company	10/31/99
St. Lucie Plant, Units 1 and 2	Florida Power and Light Company	Y2K Ready
Surry Power Station, Units 1 and 2	Virginia Electric and Power Company	Y2K Ready
Susquehanna Steam Electric Station, Units 1 and 2	Pennsylvania Power and Light Company	Y2K Ready
Three Mile Island Nuclear Station, Unit 1	GPU Nuclear Corp.	10/21/99
Turkey Point Plant, Units 3 and 4	Florida Power and Light Company	Y2K Ready
Vermont Yankee Nuclear Power Station	Vermont Yankee Nuclear Power Corporation	9/30/99
Virgil C. Summer Nuclear Station, Unit 1	South Carolina Electric & Gas Company	Y2K Ready
Vogtle Electric Generating Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Washington Public Power Supply System Nuclear Project No. 2	Washington Public Power Supply System	Y2K Ready
Waterford Steam Electric Station, Unit 3	Entergy Operations, Inc.	Y2K Ready
Watts Bar Nuclear Plant, Unit 1	Tennessee Valley Authority	10/31/99
William B. McGuire Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Wolf Creek Generating Station	Wolf Creek Nuclear Operating Corporation	Y2K Ready

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Beaver Valley Power Station, Units 1 and 2	Atmospheric Radioactive Effluent Release Assessment System (ARERAS). This system calculates environmental releases using data from the plant process monitoring and trending computers and the meteorological tower instruments. The ARERAS performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, safety status or generation capability of the plant would not be affected, but it could result in the loss of automatic calculation of release quantities and projections, which would require manual calculation of these values. This system is required for meeting regulatory requirements; it is being replaced with a system that is Y2K compliant.	Operations	9/30/99
	Emergency Response Data System (ERDS). This system automatically transmits selected plant data to the NRC in the event of a plant accident or emergency. ERDS performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, it could result in the loss of automated data transmission to regulatory agencies. Data would be communicated through other means such as telephone and facsimile. Automatic control of plant systems would not be affected. A vendor is remediating the system.	Operations	9/15/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Beaver Valley Power Station, Unit 1	Plant Monitoring and Trending Computer (IPC). This system monitors and trends Unit 1 processes. The IPC performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, it would not affect the safety status or generation capability of the plant but could require operators to revert to primary indicators and data sources. A vendor is remediating the system.	Operations	9/30/99
Beaver Valley Power Station, Unit 2	Emergency Response Facility Monitoring and Trending Computer (ERFCS). This system monitors and trends data and sends them to the emergency response facility in the event of an alert declaration; it functions as a safety parameter display system (SPDS) for Unit 2. The ERFCS performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, it would not affect safety status or generation capability of the plant but could result in the loss of historical trending during accidents, loss of displays in the emergency response facility, and loss of data to the ERDS; automatic control of plant functions would not be affected.	Operations	9/30/99
Browns Ferry Nuclear Power Station, Units 2 and 3	Health Physics Information Management System. This administrative computer system tracks and reports radiation exposure and access control to radiation areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process. The replacement program is complete and training is in progress to facilitate implementation.	Admin.	10/31/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Browns Ferry Nuclear Power Station, Units 2 and 3 (cont)	Security Check-In Process Software. This administrative computer system logs and confirms access to plant areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process; the replacement program is being tested. Minimal training and rollout will be required because this program has limited distribution and use.	Admin.	10/31/99
	Nuclear Operations Management System. This administrative system logs and reports reactor operations information. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would resort to manual logs as specified by current procedures. Programming and testing are complete, and implementation is scheduled for September 1999. Procedural revisions required for implementation that include process improvements currently restrict closure.	Admin.	10/31/99
Clinton Power Station, Unit 1	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually. Y2K readiness of this application was delayed by plant restart. General Electric Nuclear Energy (GENE) required 100% power data from the current Clinton Power Station fuel configuration to complete the site-specific design package (including Baseline 96 software). The Baseline 96 software package has been verified to be Y2K ready and has been successfully installed at other nuclear facilities.	Operations	9/22/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)			
NPP	**NPP System and Completion Activities**	**NPP System Type**	**Completion Date***
Comanche Peak Steam Electric Station, Unit 1	Unit 1 Condensate Polishing Programmable Logic Controller System. This non-safety related computer system controls feedwater treatment processes for water being drawn off the condenser. If this system is left uncorrected and it fails because of a Y2K-related failure, this system may be bypassed. The Unit 1 modification is similar to the successful modification at Unit 2. Modification of this system requires a plant outage.	Operations	11/30/99
Comanche Peak Steam Electric Station, Units 1 and 2	Common Facility - Plant Simulator. The plant training simulator provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding onsite training facility capabilities, and plant operator training schedules could be affected.	Admin.	10/30/99
Cooper Nuclear Station	Integrated Contingency Planning. The integrated contingency plan (ICP) provides facility management with a comprehensive perspective of the risks associated with Y2K-induced events, and includes any remedial actions planned during key rollover dates. The licensee has developed contingency plans for individual systems and components. The licensee is in the process of integrating these individual contingency plans into the ICP.	Operations	9/20/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Main Annunciator System (MAS). This non-safety related system provides primary and intermediate notifications of plant equipment status and plant operating status information in the main control room. The MAS is referenced in the plant emergency operating procedures as part of the instructions for confirming plant component status. The MAS could affect operability of radiation monitor alarms. If this system is left uncorrected, the licensee would continue to use the existing annunciator system with the clocks turned back to prevent system clock rollover into 2000. The upgraded MAS is scheduled to be installed no later than the end of the upcoming Unit 2 refueling outage.	Operations	10/31/99
Donald C. Cook Nuclear Plant, Units 1 and 2	Meteorological Information and Dispersion Assessment System (MIDAS). This administrative computer system tracks meteorological conditions and calculates radioactivity release dispersion patterns based on existing meteorological data. If this system is left uncorrected and it fails because of a Y2K-related failure, entry into a technical specification action statement would be required. Meteorological information can be manually obtained from the meteorological towers and transmitted to the control room for manual calculations. A design upgrade is in progress to install new computer hardware and software that is Y2K ready.	Admin.	10/30/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)			
NPP	**NPP System and Completion Activities**	**NPP System Type**	**Completion Date***
Hope Creek Nuclear Station, Unit 1	Plant Training Simulator. This system provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding on site training facility capabilities, and plant operator training schedules could be affected. The licensee is upgrading the plant simulator with the same software being used to upgrade the SPDS.	Admin.	10/29/99
	Emergency Response Data System (ERDS). This PC-based system sends emergency response data information to the NRC and local authorities. If this system is left uncorrected and it fails because of a Y2K-related failure, the licensee would report information using existing plant emergency operating procedures. The licensee is waiting for a replacement engineer workstation to be delivered.	Admin.	9/30/99
Joseph M. Farley Nuclear Plant, Unit 2	Unit 2 Turbine Digital Electrohydraulic Controller. This system controls steam flow to the plant main turbine, and provides turbine overspeed protection. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. This system was successfully installed on Unit 1 and was tested for Y2K dates. Remediation of this system is scheduled for a plant refueling outage from October 16 to December 16, 1999.	Operations	12/16/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Limerick Generating Station, Unit 2	Plant Monitoring System and 3D Monicore. This system is needed for startup and continued long-term plant operations. The 3D Monicore system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually.	Operations	9/30/99
North Anna Power Station, Unit 2	High Capacity Steam Generator (SG) Blowdown Radiation Monitor. This component monitors radiation levels in the SG blowdown effluent. This monitor does not perform a safety function but is included in the design for added protection against the potential for release of radioactivity to the environment. If this monitor is left uncorrected and it fails because of a Y2K-related failure, the plant operators will use alternate radiation monitors to detect radioactivity on the shell side of the steam generators. The firmware in the local processing and local display units will be upgraded to a Y2K compliant version.	Admin.	10/29/99
	High Capacity Steam Generator Blowdown Distributed Control System (SGBCS). This non-safety related system controls ionic impurity concentrations on the shell side of the steam generators. It is not required for continued operation of the facility. If this system is left uncorrected and it fails because of a Y2K-related failure, it would be bypassed and ionic concentrations would be determined manually. Required materials and software are on-hand and design change development is nearing completion. The original system vendor is supporting factory and on-site installation and acceptance testing.	Admin.	10/29/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)			
NPP	**NPP System and Completion Activities**	**NPP System Type**	**Completion Date***
Oyster Creek Nuclear Generating Station	REM/AACS/CISCO. This integrated software system manages personnel radiation exposure and controls access to radiologically controlled areas. If this system is left uncorrected and it fails because of a Y2K-related failure, control of radiation exposure and access would be tracked manually.	Admin.	9/30/99
Peach Bottom Atomic Power Station, Unit 2	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually.	Operations	9/30/99
Peach Bottom Atomic Power Station, Unit 3	Digital Feedwater System. This non-safety-related system controls feedwater flow rate into the reactor vessel, and is required for plant operation. The digital feedwater system to be installed in Unit 3 is identical to the Peach Bottom Unit 2 system, which has been installed, tested, and is operational. The hardware and software have been developed, and are on-site, ready for installation. A planned outage for installing this system is currently scheduled.	Operations	10/31/99
	Turbine Vibration Monitor. This system monitors reactor feedwater pump turbine and the main turbine system operation and trips these turbines when excessive vibration is detected. If this system is left uncorrected and it fails because of a Y2K-related failure, it will not result in a spurious feedwater pump turbine trip or a main turbine trip. These two trips are for equipment protection only. An identical computer system upgrade has been performed on Peach Bottom Unit 2. The Unit 3 work will be performed during the next outage.	Operations	10/31/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Peach Bottom Atomic Power Station, Unit 3 (cont)	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually.	Operations	9/30/99
Salem Nuclear Generating Station, Unit 1	Advanced Digital Feedwater System. This non-safety-related system controls feedwater flow rate into the steam generators, and is required for plant operation. The system is identical to the Salem Unit 2 system, which has been installed, tested, and is operational. The only part of this system affected by Y2K-related issues is an engineering workstation, which provides the human interface to the feedwater system. If this system is left uncorrected and the workstation fails because of a Y2K-related failure, the operators could adjust feedwater flow rate manually using existing control room instrumentation and controls. This upgrade has been performed on Salem Unit 2 and is scheduled for installation during the Unit 1 refueling outage.	Operations	11/6/99
	Overhead Annunciators. These components provide primary and intermediate notifications of plant equipment status and plant operating status information in the main control room. The overhead annunciators are referenced in the plant emergency operating procedures as part of the instructions for confirming plant component status. If the annunciators are left uncorrected and it fails because of a Y2K-related failure, plant equipment status would be monitored manually. Replacement of this system is outage-dependent. This upgrade has been performed on Salem Unit 2 and a similar upgrade is scheduled for the Unit 1 refueling outage.	Operations	11/6/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Salem Nuclear Generating Station, Unit 1 (cont)	Plant Computer Monitoring and Alarm System. This system monitors and displays plant data for reactor operations. If this system is left uncorrected and it fails because of a Y2K-related failure, the operators would obtain needed plant information from the normal plant indications. This system is needed for operations when the reactor core coolant level is lowered to support mid-loop operations (a special refueling outage maintenance procedure for steam generator maintenance). There are no regulatory requirements for this system while the plant is at full power. This upgrade must be performed while the plant is in an outage. This upgrade has been performed on Salem Unit 2 and a similar upgrade is scheduled for the Unit 1 refueling outage.	Operations	11/6/99
Salem Nuclear Generating Station, Units 1 and 2	Plant Training Simulator. The plant training simulator provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding on site training facility capabilities, and plant operator training schedules could be affected. The licensee is upgrading the plant simulator with the same software being used to upgrade the SPDS.	Admin.	10/29/99
	Emergency Response Data System (ERDS). This PC-based system sends emergency response data information to the NRC and local authorities. If this system is left uncorrected and it fails because of a Y2K-related failure, the licensee would report information using existing plant emergency operating procedures. The licensee is waiting for a replacement engineer workstation to be delivered.	Admin.	9/30/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Sequoyah Nuclear Plant, Units 1 and 2	Health Physics Information Management System. This administrative system tracks and reports radiation exposure and access control to radiation areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process. The replacement program is complete and training in progress to facilitate implementation.	Admin.	10/31/99
	Security Check-In Process Software. This administrative computer system logs and confirms access to plant areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process; the replacement program is in BETA testing. Minimal training and rollout will be required because this program has limited distribution and use.	Admin.	10/31/99
	Nuclear Operations Management System. This administrative computer system logs and reports rector operations information. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would resort to manual logs as specified by current procedures. Programming and testing are complete, and implementation is scheduled for September 1999. Procedural revisions required for implementation that include process improvements currently restrict closure.	Admin.	10/31/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)			
NPP	**NPP System and Completion Activities**	**NPP System Type**	**Completion Date***
South Texas Project Electric Generating Station, Units 1 and 2	Plant Integrated Computer System (ICS). This system collects plant operating information and displays plant status in the main control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the operators would use existing plant instrumentation information as required by plant procedures and training. This system has been installed and tested for Y2K readiness, but the final change from all legacy systems to the new ICS has not yet occurred. This project has been ongoing for several years to address obsolescence, and was not implemented as a result of the licensee's Y2K project.	Operations	10/31/99
Three Mile Island Nuclear Station, Unit 1	Digital Turbine Control System. This system controls steam flow to the plant main turbine. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. A replica simulation of the digital turbine control system was configured and tested in the designer/supplier's shop to demonstrate the system is Y2K ready.	Operations	10/21/99
	REM/AACS/CISCO. This system manages personnel radiation exposures and controls access to radiologically controlled areas. If this system is left uncorrected and it fails because of a Y2K-related failure, control of radiation exposure and access would be tracked manually.	Admin.	9/30/99

* All safety-related systems are Y2K ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)

NPP	NPP System and Completion Activities	NPP System Type	Completion Date*
Vermont Yankee Nuclear Power Station	Refueling Platform - This system controls the refueling platform during fuel movements. If this system is left uncorrected and it fails because of a Y2K-related failure, the electronic logic required for control of the safety-related platform would be rendered inoperable, preventing fuel movement. However, the refueling platform is not expected to be moved occur during the key rollover dates. If the platform is needed immediately following the 1999 refueling outage (after December 31, 1999) and hasn't been remediated, the computer date could be manually reset to an earlier 1999 date.	Admin.	9/30/99
Watts Bar Nuclear Plant, Unit 1	Health Physics Information Management System. This administrative system tracks and reports radiation exposure and access control to radiation areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process. The replacement program is complete and training is in progress to facilitate implementation.	Admin.	10/31/99
	Nuclear Operations Management System. This administrative system logs and reports reactor operations information. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would resort to manual logs as specified by current procedures. Programming and testing are complete, and implementation is scheduled for September 1999. Procedural revisions required for implementation that include process improvements currently restrict closure.	Admin.	10/31/99

* All safety-related systems are Y2K ready

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NRC ESTABLISHES POLICY FOR REGULATORY ACTIONS FOR NUCLEAR

POWER PLANTS THAT ARE NOT "Y2K READY"

The Nuclear Regulatory Commission has approved a policy to guide regulatory actions for nuclear power plant licensees that did not report that their facilities were "Y2K ready" by July 1.

The new policy, which applies to those 35 plants that were not Y2K ready as of July 1, provides for regulatory actions to be taken sufficiently in advance of the December 31 to January 1 transition to assure that nuclear power plants will be in a stable, safe condition during the Y2K rollover date.

Under the new policy, for those plants with a projected Y2K item completion date between July 1 and September 30, (about 13 plants) the NRC will continue to monitor licensees' progress, verify completion of remaining Y2K-related activities, and document results in NRC inspection reports.

The degree of additional NRC scrutiny for the remaining plants (about 22) will depend on the nature of the work that needs to be completed to be Y2K-ready.

Plants with non-safety, support systems and components that are not Y2K-ready or plants that have incomplete contingency plans for these systems could require additional meetings, audits, or requests for additional information. There are about 10 plants in this category.

- Plants with non-safety systems that affect power operation that are Y2K-ready or those plants that have incomplete contingency plans for these systems will be subject to additional regulatory actions which may include issuance of an order requiring specific actions by the licensee. There are about 12 plants in this category.

By September 30, NRC will make a final determination whether additional regulatory action is warranted to address Y2K readiness issues. At this time, NRC believes that all licensees will be able to operate their plants safely during the transition from 1999 to 2000, and that NRC-directed plant-specific action will not be needed.

All 103 operating nuclear power plants reported July 1 that their plant safety systems were Y2K-ready and that there were no remaining Y2K-related problems that could directly affect the performance of safety systems or the capability for safe shutdown of the reactor. In addition, 68 of these plants reported they had completed, as the next order of priority, Y2K-readiness work for all of their computer systems that support plant operation. The remaining 35 plants reported that, to be fully Y2K-ready, they still had

additional work to complete on a few non-safety computer systems or devices.

For about one half of the 35 plants, some work remains on systems needed for power generation. Other plants must perform remediation on plant monitoring and administrative systems. Typically, the remaining Y2K work will be completed during a scheduled plant outage in the fall or delayed while awaiting the delivery of a replacement component. In each case, the licensees with work remaining have provided satisfactory schedules for completing the work.

Current Status of Nuclear Power Plant Y2K Readiness

The plants that have Y2K work remaining are continuing to progress toward Y2K readiness. As of August 1, five more plants have reported that they are Y2K-ready bringing the total to 73 operating nuclear power plants that are fully Y2K-ready. This reduces to 30 the number of plants that have remaining work on non-safety systems and components to be fully Y2K-ready.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction. "Y2K-ready" means that functions provided by computer systems will be carried out successfully with the coming of the Year 2000.

Additional information on the policy can be found in a staff paper, SECY-99-162, on NRC's Y2K web site at: www.nrc.gov/NRC/NEWS/year2000.html.

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NRC SENDS LETTERS TO UTILITIES TO FOLLOW UP Y2K READINESS AT NUCLEAR POWER PLANTS

The Nuclear Regulatory Commission has sent letters to those utilities with nuclear power plants that are scheduled to be "Y2K ready" after September 30 to verify the status of readiness and the dates when plants will be fully Y2K ready.

There are no Y2K-related problems affecting the performance of safety systems needed to safely operate or shut down at any of the 103 nuclear power plants. By September 30, 91 of these plants are scheduled to have completed all remaining Y2K work for their computer systems that support plant operation. In addition, they will have contingency plans in place. The remaining 12 plants have additional work to complete on a few non-safety systems or devices, to be fully Y2K ready. These plants are continuing to progress toward Y2K readiness.

As a follow-up to July 1 Y2K readiness reports from licensees, the NRC has sent letters to these 12 plants to ensure that all deficiencies are repaired before the Y2K transition. In order to schedule NRC inspections, licensees were asked to provide any changes to the scope of remaining Y2K work or to the projected completion date (previously provided to NRC July 1). The NRC sent letters to the following plants:

Plant Name	Nearest City	Y2K Ready Date
Comanche Peak Unit 1	Glen Rose, TX	11/30/99
Comanche Peak Unit 2	Glen Rose, TX	10/30/99
Cook Units 1 & 2	Bridgman, MI	10/30/99
Hope Creek	Hancocks Bridge, NJ	10/29/99
Farley Unit 2	Columbia, AL	12/16/99
Peach Bottom Unit 3	Delta, PA	10/31/99
Salem Unit 1	Hancocks Bridge, NJ	11/6/99
Salem Unit 2	Hancocks, Bridge, NJ	10/29/99

South Texas Units 1 & 2	Bay City, TX	10/31/99
Three Mile Island Unit 1	Middletown, PA	10/21/99

Typically, the remaining work will be completed in conjunction with a scheduled plant outage or when a replacement component is delivered. The NRC will continue to monitor and verify completion of Y2K activities at these plants.

Details of the remaining work are provided in an NRC report, NUREG 1706, "Year 2000 Readiness in U.S. Nuclear Power Plants." It is available on the NRC's Y2K web site at: http://www.nrc.gov/NRC/NEWS/year2000.html.

The "Y2K" problem refers to a computer's potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, a computer system could read "00" as 1900, rather than 2000, potentially causing a computer system to malfunction. "Y2K ready" means that functions provided by a computer will be carried out successfully with the coming of the Year 2000.

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United States Nuclear Regulatory Commission

Status Report on Year 2000 Activities for June 1999

INTRODUCTION

This report is the sixth periodic report on the status of agency Y2K activities. The report covers the period from May 1 through May 31, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

The NRC regional staffs have completed eleven Y2K site reviews and forwarded the preliminary results (checklists) to the Office of Nuclear Reactor Regulation (NRR) for evaluation. The results of these reviews will be considered along with licensees' responses to Generic Letter (GL) 98-01 -- due July 1 -- and integrated into a single report to be issued in August. A public announcement on the overall status of nuclear power plants' Y2K readiness is planned for early July.

Preliminary conclusions from these reviews indicate licensees are following plans that are consistent with the industry guidance (NEI/NUSMG 97-07 and NEI/NUSMG 98-07). Most assessment and remediation activities are complete. Licensees have started, but not completed, contingency planning. They are appropriately concentrating their efforts on finishing detailed assessments of software applications and embedded components.

The staff is preparing criteria for regulatory action that may be needed for nuclear power plants that have not completed their Y2K readiness activities, including remediation and contingency planning, by July 1. These criteria are currently under review by NRR and Regional management.

During the week of May 17, the NRR staff completed three of the six planned audits of licensee Y2K contingency plans. The sites audited were Indian Point 2, Turkey Point, and Palo Verde. Reports from the audits will be made publicly available on the NRC Y2K Website.

The NRC staff found that all three licensees were following acceptable industry guidance. Palo Verde and Turkey Point, have completed most of their contingency planning for internal and external events. Indian Point 2 was not as far along as the other two plant sites; however, the licensee (Consolidated Edison Co.) expects to complete contingency planning by the end of June. The NRC plans to conduct the remaining audits of licensees' Y2K contingency plans by mid-June at the Diablo Canyon, Duane Arnold, and Oconee plants.

On May 18, the staff forwarded SECY-99-135, "Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition" to the Commission for approval.

The staff is incorporating comments from the Office of the General Counsel and the Office of Nuclear Material Safety and Safeguards on the draft response to the three Nuclear and Information and Resource Service (NIRS) petitions relating to Y2K.

As reported in the April 13, 1999 Agency Y2K Status report, the Nuclear Energy Institute (NEI) informed the staff that about 20 sites will not be fully Y2K ready on July 1, 1999. These sites will have completed nearly all Y2K readiness activities except where work on a small number of systems or components remains incomplete. It appears that approximately half of these 20 sites will complete their work by September 1999. The remaining half will complete their work by November 1999 and are, for example, waiting for a scheduled outage to implement a repair or for delivery of parts by vendors to complete their Y2K readiness activities. All other sites are expected to be Y2K ready by July 1, 1999. The staff plans to meet with NEI in mid-June to discuss industry Y2K activities.

The industry continues to be actively engaged in addressing the Y2K problem. On April 30, the North American Electric Reliability Council (NERC) released its First Quarter 1999 status report on "Preparing the Electric Power Systems of North America for Transition to the Year 2000." This report is located on the NERC website at http://www.nerc.com.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

The staff is developing two Y2K Information Notices (INs) for nuclear materials licensees. The first IN updates licensees on the staff's Y2K activities and provides website addresses for Y2K information. The second IN emphasizes the importance of Y2K contingency plans. These INs are scheduled to be issued by July 1.

The NRC's Office of Nuclear Materials Safety and Safeguards and the Department of Energy are working together to provide a single, national response to an International Atomic Energy Agency (IAEA) Y2K Safeguards Questionnaire. This questionnaire is similar to the previous IAEA Y2K questionnaire dealing with nuclear safety. Additional information on IAEA Y2K activities can be found at http://www.iaea.org.

CONTINGENCY PLANNING

On May 18, the staff forwarded to the Commission SECY-99-134, "Agency Contingency Plans for the Year 2000 Computer Problem in the Nuclear Industry," to the Commission. The Commission is expected to act on this paper in early June.

The staff is planning a Y2K Contingency Plan table top exercise involving the NRC, Baltimore Gas and Electric (BGE), the State of Maryland and counties surrounding the Calvert Cliffs Nuclear Power Plant for July 14. On October 15, the NRC staff plans to fully exercise the Agency's Y2K Contingency Plan. Commonwealth Edison is coordinating the exercise play from a half dozen nuclear power plant licensees. This exercise will also test the back-up communications systems, including soon-to-be procured NRC satellite telephones. Procurement will be based on a consultant's cost-benefit analysis of the available satellite communication options.

INTERNATIONAL PROGRAMS

On May 18, 1999, four members of the French National Y2K Committee met with representatives from the Office of International Programs, NRR, and the Incident Response Operations to discuss Y2K issues regarding nuclear safety, grid stability and contingency planning. The French team was on a tour in the U.S. to discuss Y2K issues with private organizations and other government agencies.

The second prototype of the Y2K Early Warning System (YEWS) was completed and distributed for

comment. South Korea and Taiwan have committed to participate in YEWS. Discussions with Japan on participation in YEWS are in progress.

CONGRESSIONAL AFFAIRS

The House Government Reform Committee's Subcommittee on Government Management, Information, and Technology is planning a series of field hearings in July on federal, state, and local preparedness for Y2K. At this time, the NRC is not expected to be invited. The Subcommittee, chaired by Rep. Horn (R-CA), is tentatively planning hearings in Kansas, Chicago, and Detroit on successive days from July 7-9. Panels might include GAO and local witnesses representing power, water, food storage, and telephone companies, hospitals, and emergency preparedness departments.

PUBLIC AFFAIRS AND Y2K COMMUNICATION ACTIVITIES

As of the end of May, the NRC Web site was responding to approximately 3,000 page-requests per week for Year 2000 information - down from 5,800 page-requests per week for mid- March. Currently, the most frequently-requested pages are:

NRC Year 2000 Page	31 percent of Y2K requests
Y2K Contingency Planning Page	11 percent of Y2K requests
Nuclear Reactors Y2K Page	8 percent of Y2K requests
NRC Y2K Draft Contingency Plan	7 percent of Y2K requests
Y2K Frequently Asked Questions	5 percent of Y2K requests
May 1999 EDO Y2K Status Report	4 percent of Y2K requests
NRC Y2K References Page	4 percent of Y2K requests

Less than ten requests per day are being received for information, such as the NRC reports on twelve previously- completed Y2K audits of nuclear power plants and the NRC Inspection Manual Temporary Instruction TI-2515/141 (Review of Year 2000 Readiness of Computer Systems at Nuclear Power Plants).

United States Nuclear Regulatory Commission

Status Report on Year 2000 Activities for October 1999

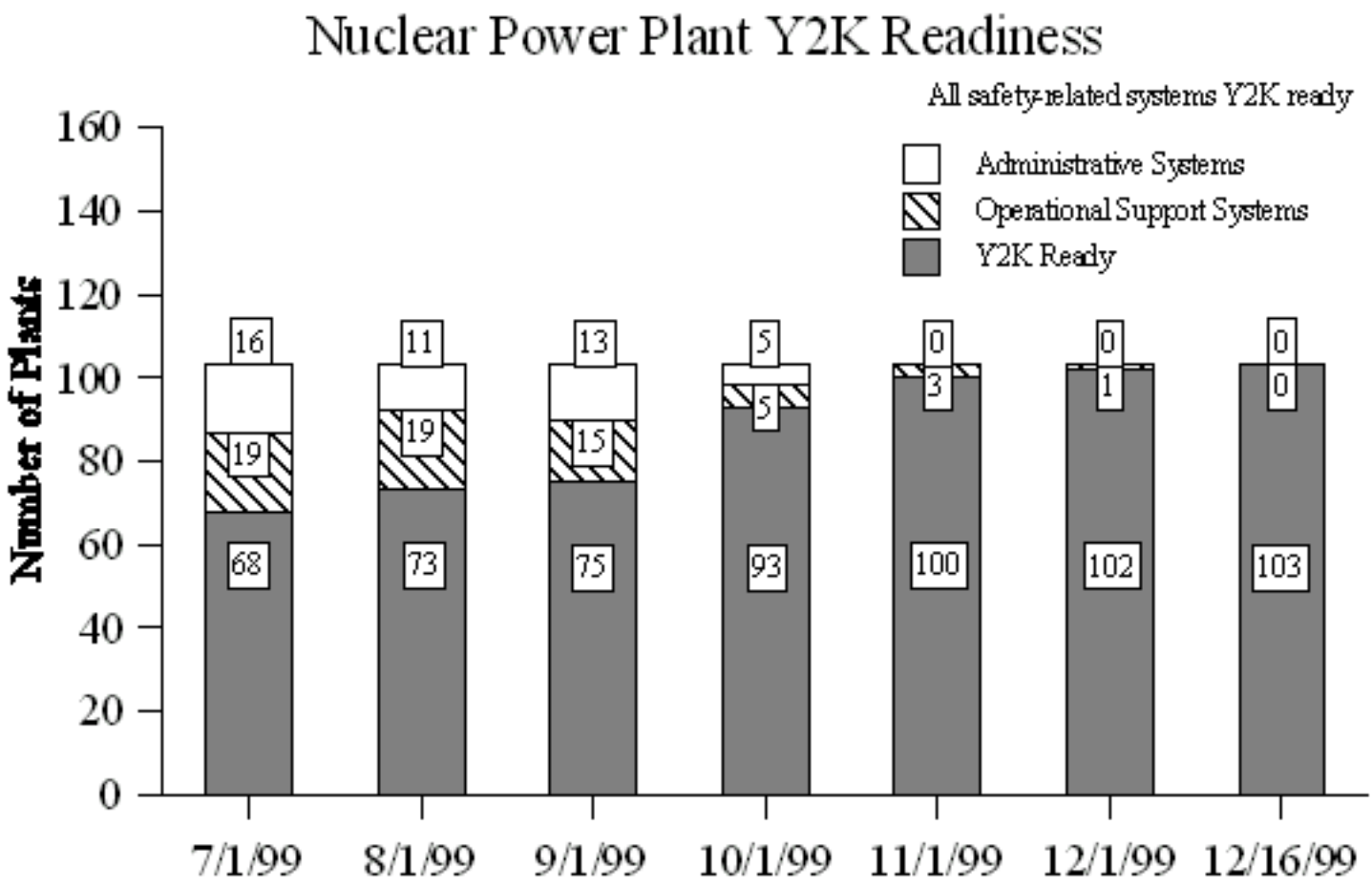
INTRODUCTION

This report is the tenth periodic report on the status of agency Y2K activities. The report covers the period from September 1 through September 30, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

As previously reported, by July 1, 1999, all 103 operating nuclear power plants reported status of Y2K readiness to the NRC. Regarding NRC's highest priority-the uninterrupted performance of plant safety systems-all nuclear power plants report that their efforts are complete, and that no remaining Y2K-related problems exist that could directly affect the performance of safety systems or the capability for safe shutdown. Sixty-eight of these plants had also completed the next order of priority as of July 1, stating that all of their computer systems that support plant operation are "Y2K ready." The remaining 35 plants reported that, to be fully Y2K ready, they still have additional work to complete on a few non-safety computer systems or devices. Typically, the remaining Y2K work is waiting on a scheduled plant outage or the delivery of a replacement component. In each case, the licensees with work remaining have provided schedules for completing that work.

The plants that have Y2K work remaining are continuing to progress toward Y2K readiness. As of September 30, 1999, only 10 plants had Y2K work remaining and 93 plants have reported that they were Y2K ready. During September, we received letters from Beaver Valley 1 & 2, Browns Ferry 2 & 3, Clinton 1, Cooper, Diablo Canyon 1 & 2, Limerick 2, North Anna 2, Oyster Creek, Peach Bottom 2, Sequoyah 1 & 2, South Texas 1 & 2, Vermont Yankee, and Watts Bar 1 reporting that they were Y2K ready. Table 1 (Attachment 1A) provides a summary of nuclear power plant (NPP) Y2K readiness status. Table 2 (Attachment 1B) provides a summary of NPP systems and components requiring completion of Y2K readiness activities. The NRC will continue to monitor progress at those plants with remaining work and will independently verify completion of the scheduled items, including reviews of licensee Y2K contingency plans. The following chart illustrates plant readiness.



The solid shaded regions of the chart represent the number of NPPs that are already Y2K ready or are scheduled to be Y2K ready on the corresponding date. The diagonally shaded regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and have systems to be remediated that could affect power operations. (Remediation is defined in Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 98-07 "Nuclear Utility Year 2000 Readiness Contingency Planning" (an NRC endorsed industry guidance document) as the process of retiring, replacing, or modifying software or devices that have been determined to be affected by the Y2K problem.) The unshaded regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and that have only systems that could affect NPP administrative functions.

As discussed in the previous monthly report, the staff identified 14 of the 103 operating NPPs that required additional staff follow-up reviews in order for the staff to evaluate more fully each phase of the licensee's Y2K program. In 13 of the 14 reviews, the staff was able to conclude that the licensees were following a program that was consistent with industry guidance. However, in reviewing the integrated contingency planning activities at Cooper Nuclear Station (CNS), the staff determined that the licensee's Integrated Contingency Plan (ICP) was not sufficiently complete for the staff to conclude that CNS was fully Y2K ready, although all safety-related systems and components were Y2K ready. The licensee for CNS has since revised the ICP to include twenty-four new or enhanced individual contingency plans. The licensee reported that the revised Y2K contingency plans were approved on September 2, 1999, and that they include sufficient detail to meet the guidelines of NEI/NUSMG 98-07. Additionally, the licensee reported that a thorough review of additional assessment packages, including material in the

database, revealed no other deficiencies related to the earlier reported three instances of inaccurate information being provided by the contractor (none of these components involved systems needed to safely shut down the plant and the licensee's Y2K readiness status was not affected). The licensee has updated the documentation to correct the inaccuracies. The resident inspector has confirmed that CNS has satisfactorily addressed the above items, including the integrated contingency planning that had previously been assessed as "not ready" by the staff.

During September, the staff sent letters to the licensees of the 12 facilities that were not expected to be Y2K ready by September 30, 1999, to confirm their completion schedules for the remaining work. These plants included Comanche Peak Units 1 & 2, Cook Unit 1 & 2, Hope Creek, Farley Unit 2, Peach Bottom Unit 3, Salem Units 1 & 2, South Texas Units 1 & 2, and Three Mile Island Unit 1. However, it should be noted that on September 28, South Texas Units 1 & 2 reported that they had completed their work ahead of schedule and were Y2K ready.

Typically, the remaining work will be completed in conjunction with a scheduled plant outage or when a replacement component is delivered. At this time, we believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond, and we do not anticipate the need for the NRC to direct any plant-specific action.

OTHER Y2K RELATED ACTIVITIES

NUREG-1706, "Year 2000 Readiness in US Nuclear Power Plants," was published. This NUREG provides the results of NRC conducted onsite reviews of licensee Y2K programs at the 103 nuclear power plants, additional staff assessment of followup reviews of 14 plants, and updated information relating to plant-specific reviews. On the basis of the results of the completed reviews, the staff concluded that all licensees were implementing Y2K programs that were consistent with the NRC-approved industry guidance. NUREG-1706 is available on the NRC's web site at http://www.nrc.gov/NRC/NEWS/year2000.html.

On September 9, 1999, the staff monitored one of the critical dates (9/9/99) considered in the Y2K readiness programs at nuclear power plants and found that no plant problems attributable to this date were reported.

The staff continues to work with industry to address situations where a licensee or vendor discovers that a component or equipment previously thought to be Y2K ready, is found to have a Y2K deficiency. The staff met with NEI on September 10, 1999, to discuss Y2K readiness activities, including configuration control and sharing of generic Y2K information. Additionally, during the last week of October the staff will be participating in the NUSMG 21st Semi-Annual Workshop entitled, "Software Project Controls & Software Configuration Management," hosted by the New York Power Authority. A presentation on the NRC's Y2K activities and various other Y2K related issues will be given. Lessons learned from Y2K programs will also be discussed with NUSMG representatives. Also, the staff is participating in EPRI 7th Y2K Embedded Systems Workshop in San Diego on October 28.

The staff has nearly completed implementing procedures for Y2K-related Notices of Enforcement Discretion (NOEDs) for inclusion in the NRC Contingency Plan. This procedure contains the process for granting Y2K-related and other NOEDs during the Y2K transition, the delegation of authority memorandum from the Director of NRR, the staffing plan, a sample NOED processing worksheet, and examples of possible NOED scenarios. This implementing procedure will be finalized after the October

15, 1999, Y2K exercise. The staff is also preparing responses to individuals who provided comments on the Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

The Office of Nuclear Material Safety and Safeguards (NMSS) representatives visited the Paducah gaseous diffusion plant during the week of September 20, 1999, to discuss Y2K readiness activities. An NMSS inspection report on the Paducah visit is being written and is expected to be issued in October and will be placed on the NMSS Y2K webpage.

An NMSS inspection report for the Y2K inspection at the Portsmouth gaseous diffusion plant has been completed. A summary of the report will be placed on the NMSS Y2K webpage.

NMSS will provide an expert in gaseous diffusion plants and high enriched uranium fuel fabrication facilities to Region IV during the October 15 Y2K exercise and during the Y2K transition.

An updated status of the Y2K readiness of fuel cycle facilities as of September 30, 1999 is provide as Table 3 (Attachment 1C).

CONGRESSIONAL INTERACTION

On September 23, Mr. Frank Miraglia, Deputy Executive Director for Reactor Programs, testified before the Senate Energy and Natural Resources Committee on "Y2K: Will the Lights Go Out?" Mr. Miraglia reported on the Y2K readiness of nuclear plants' safety systems and on the NRC's plans for those plants with remaining Y2K issues. Witnesses from the Department of Energy and the North American Electric Reliability Council also presented testimony. A tentative hearing is being planned for October 22 to be jointly conducted by the House Government Reform SubCommittee on Government Management, Information, and Technology and the House Science Technology Committee on the Y2K readiness of nuclear power plants domestically and abroad.

NRC responded to one controlled correspondence item on Y2K issues from Representative Barbara Lee. Several other replies to Congressional letters are being prepared.

CONTINGENCY PLANNING AND INTERNATIONAL PROGRAMS

Final plans and preparations for the October 15th exercise were made during the month of September. On September 29-30, an Emergency Response Coordinator (ERC) counterpart meeting was held in Region III to discuss the detailed Y2K implementing procedures that will be tested during the October 15th exercise. Testing of the satellite phones has progressed as planned. Regions that have completed their testing report that the Iridium phones work well. A Y2K Contingency Plan Task Force representative observed the North American Electric Reliability Council drill on September 9th, 1999. The exercise successfully demonstrated how grid stability concerns would ultimately be communicated from the source to the White House Information Coordination Center (ICC) during the Y2K transition. The staff prepared a memo to the Commission outlining plans for staffing the White House ICC. The ICC exercise scheduled for October 13-14th has been canceled. There will now be only two ICC exercises; the first exercise will be on November 3-4th and the second (stressed) exercise will be December 8-9. The staff plans to make use of the press center facilities in the NRC auditorium to simulate the ICC Joint Public Information Center during the October 15th exercise.

The prototype of the Y2K Early Warning System (YEWS) went online during the week of September 27 to allow users to familiarize themselves with its features and to solicit user comments. So far there are 107 registered users from 25 countries and 17 U.S. utilities. After modifications to YEWS, based on user comments, the system will be made available again during the week of October 11 and for the NRC's Y2K contingency plan exercise on October 15, which will have international participation.

PUBLIC AFFAIRS AND Y2K COMMUNICATIONS ACTIVITIES

During September, the Office of Public Affairs issued three press releases on Y2K--

- 9/2 - Notice on 9/10 meeting with the Nuclear Energy Institute to discuss the status of Y2K readiness at nuclear power plants and how Y2K readiness will be maintained as well as reporting any changes in readiness to the NRC.
- 9/7 - NRC's confirmation of no Y2K problems affecting safety systems of nuclear power plants and an update showing 75 plants fully Y2K ready.
- 9/28 - Notice of NRC sending follow-up letters to 12 nuclear power plants to verify work to be completed and the dates when they will be fully Y2K ready; 91 plants fully Y2K ready.

During the month of September 1999, the NRC Web site saw a lower demand for Year 2000 information. The NRC Year 2000 Page dropped to 24th most requested page on the NRC Web site but remains the 7th most popular single entry page. A single entry page indicates visitors have either bookmarked the page or have obtained the page address from another source.

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," (an Adobe Acrobat file) was the 4th most downloaded file on the NRC Web site. This report has now replaced the NRC Y2K Contingency Plan on the agency's top 10 downloads list.

Attachments:

1A. Table 1, "NPP Y2K Readiness Status as of October 1, 1999"

1B. Table 2, "NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of October 1, 1999"

1C. Table 3, "Fuel Fabrication and Gaseous Diffusion Plant Systems and Components Requiring Completion of Year 2000 Readiness Activities as of October 1, 1999"

Table 1 NPP Y2K Readiness Status as of October 1, 1999*		
NPP Name	**NPP Licensee**	**Readiness Status/Date****
Arkansas Nuclear One, Units 1 and 2	Entergy Operations, Inc.	Y2K Ready
Beaver Valley Power Station, Units 1 and 2	Duquesne Light Company	Y2K Ready
Braidwood Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Browns Ferry Nuclear Power Station, Units 2 and 3	Tennessee Valley Authority	Y2K Ready

Brunswick Steam Electric Plant, Units 1 and 2	Carolina Power and Light Company	Y2K Ready
Byron Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Callaway Plant, Unit 1	Union Electric Company	Y2K Ready
Calvert Cliffs Nuclear Power Plant, Units 1 and 2	Baltimore Gas and Electric Company	Y2K Ready
Catawba Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Clinton Power Station, Unit 1	Illinois Power Company	Y2K Ready
Comanche Peak Steam Electric Station, Unit 1	Texas Utilities Electric Company	11/30/99
Comanche Peak Steam Electric Station, Unit 2	Texas Utilities Electric Company	10/30/99
Cooper Nuclear Station	Nebraska Public Power District	Y2K Ready
Crystal River Unit 3 Nuclear Generating Plant	Florida Power Corporation	Y2K Ready
Davis-Besse Nuclear Power Station, Unit 1	First Energy Services Corporation	Y2K Ready
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Pacific Gas and Electric Company	Y2K Ready
Donald C. Cook Nuclear Plant, Units 1 and 2	Indiana Michigan Power Company	10/30/99
Dresden Nuclear Power Station, Units 2 and 3	Commonwealth Edison Company	Y2K Ready
Duane Arnold Energy Center	IES Utilities, Inc.	Y2K Ready
Edwin I. Hatch Nuclear Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Enrico Fermi Atomic Power Plant, Unit 2	Detroit Edison Company	Y2K Ready
Fort Calhoun Station, Unit 1	Omaha Public Power District	Y2K Ready
Grand Gulf Nuclear Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
H. B. Robinson Plant, Unit 2	Carolina Power and Light Company	Y2K Ready
Hope Creek Nuclear Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	10/29/99
Indian Point Unit No. 2	Consolidated Edison Company of New York, Inc.	Y2K Ready
Indian Point Station, Unit 3	Power Authority of the State of New York	Y2K Ready
James A. FitzPatrick Nuclear Power Plant	Power Authority of the State of New York	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 1	Southern Nuclear Operating Company, Inc.	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 2	Southern Nuclear Operating Company, Inc.	12/16/99
Kewaunee Nuclear Power Plant	Wisconsin Public Service Corporation	Y2K Ready
LaSalle County Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Limerick Generating Station, Unit 1	PECO Energy Company	Y2K Ready
Limerick Generating Station, Unit 2	PECO Energy Company	Y2K Ready
Millstone Nuclear Power Station, Units 2 and 3	Northeast Nuclear Energy Company	Y2K Ready
Monticello Nuclear Generating Plant	Northern States Power Company	Y2K Ready
Nine Mile Point Nuclear Station, Units 1 and 2	Niagara Mohawk Power Corporation	Y2K Ready

North Anna Power Station, Unit 1	Virginia Electric and Power Company	Y2K Ready
North Anna Power Station, Unit 2	Virginia Electric and Power Company	Y2K Ready
Oconee Nuclear Station, Units 1, 2, and 3	Duke Energy Corporation	Y2K Ready
Oyster Creek Nuclear Generating Station	GPU Nuclear Corp.	Y2K Ready
Palisades Nuclear Plant	Consumers Energy Company	Y2K Ready
Palo Verde Nuclear Generating Station, Units 1, 2, and 3	Arizona Public Service Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 2	PECO Energy Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 3	PECO Energy Company	10/31/99
Perry Nuclear Power Plant, Unit 1	First Energy Nuclear Operating Company	Y2K Ready
Pilgrim Nuclear Power Station, Unit 1	Boston Edison Company	Y2K Ready
Point Beach Nuclear Plant, Units 1 and 2	Wisconsin Electric Power Company	Y2K Ready
Prairie Island Nuclear Generating Plant, Units 1 and 2	Northern States Power Company	Y2K Ready
Quad Cities Nuclear Power Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
River Bend Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
Robert Emmet Ginna Nuclear Plant, Unit 1	Rochester Gas and Electric Corp.	Y2K Ready
Salem Nuclear Generating Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	11/6/99
Salem Nuclear Generating Station, Unit 2	Public Service Electric and Gas Co. of New Jersey	10/29/99
San Onofre Nuclear Generating Station, Units 2 and 3	Southern California Edison Company	Y2K Ready
Seabrook, Unit 1	North Atlantic Energy Service Corporation	Y2K Ready
Sequoyah Nuclear Plant, Units 1 and 2	Tennessee Valley Authority	Y2K Ready
Shearon Harris Nuclear Power Plant, Unit 1	Carolina Power and Light Company	Y2K Ready
South Texas Project Electric Generating Station, Units 1 and 2	South Texas Project Nuclear Operating Company	Y2K Ready
St. Lucie Plant, Units 1 and 2	Florida Power and Light Company	Y2K Ready
Surry Power Station, Units 1 and 2	Virginia Electric and Power Company	Y2K Ready
Susquehanna Steam Electric Station, Units 1 and 2	Pennsylvania Power and Light Company	Y2K Ready
Three Mile Island Nuclear Station, Unit 1	GPU Nuclear Corp.	10/21/99
Turkey Point Plant, Units 3 and 4	Florida Power and Light Company	Y2K Ready
Vermont Yankee Nuclear Power Station	Vermont Yankee Nuclear Power Corporation	Y2K Ready
Virgil C. Summer Nuclear Station, Unit 1	South Carolina Electric & Gas Company	Y2K Ready
Vogtle Electric Generating Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Washington Public Power Supply System Nuclear Project No. 2	Washington Public Power Supply System	Y2K Ready
Waterford Steam Electric Station, Unit 3	Entergy Operations, Inc.	Y2K Ready
Watts Bar Nuclear Plant, Unit 1	Tennessee Valley Authority	Y2K Ready

William B. McGuire Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Wolf Creek Generating Station	Wolf Creek Nuclear Operating Corporation	Y2K Ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of October 1, 1999*

NPP	NPP System and Completion Activities	**NPP System Type**	**Completion Date****
Comanche Peak Steam Electric Station, Unit 1	Unit 1 Condensate Polishing Programmable Logic Controller System. This non-safety related computer system controls feedwater treatment processes for water being drawn off the condenser. If this system is left uncorrected and it fails because of a Y2K-related failure, this system may be bypassed. The Unit 1 modification is similar to the successful modification at Unit 2. Modification of this system requires a plant outage.	Operations	11/30/99
Comanche Peak Steam Electric Station, Units 1 and 2	Common Facility - Plant Simulator. The plant training simulator provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding onsite training facility capabilities, and plant operator training schedules could be affected.	Admin.	10/30/99
Donald C. Cook Nuclear Plant, Units 1 and 2	Meteorological Information and Dispersion Assessment System (MIDAS). This administrative computer system tracks meteorological conditions and calculates radioactivity release dispersion patterns based on existing meteorological data. If this system is left uncorrected and it fails because of a Y2K-related failure, entry into a technical specification action statement would be required. Meteorological information can be manually obtained from the meteorological towers and transmitted to the control room for manual calculations. A design upgrade is in progress to install new computer hardware and software that is Y2K ready.	Admin.	10/30/99
Hope Creek Nuclear Station, Unit 1	Plant Training Simulator. This system provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding on site training facility capabilities, and plant operator training schedules could be affected. The licensee is upgrading the plant simulator with the same software being used to upgrade the SPDS.	Admin.	10/29/99
	Emergency Response Data System (ERDS). This PC-based system sends emergency response data information to the NRC and local authorities. If this system is left uncorrected and it fails because of a Y2K-related failure, the licensee would report information using existing plant emergency operating procedures. The licensee is waiting for a replacement engineer workstation to be delivered.	Admin.	
Joseph M. Farley Nuclear Plant, Unit 2	Unit 2 Turbine Digital Electrohydraulic Controller. This system controls steam flow to the plant main turbine, and provides turbine overspeed protection. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. This system was successfully installed on Unit 1 and was tested for Y2K dates. Remediation of this system is scheduled for a plant refueling outage from October 16 to December 16, 1999.	Operations	12/16/99
Peach Bottom Atomic Power Station, Unit 3	Digital Feedwater System. This non-safety-related system controls feedwater flow rate into the reactor vessel, and is required for plant operation. The digital feedwater system to be installed in Unit 3 is identical to the Peach Bottom Unit 2 system, which has been installed, tested, and is operational. The hardware and software have been developed, and are on-site, ready for installation. A planned outage for installing this system is currently scheduled.	Operations	10/31/99

	Turbine Vibration Monitor. This system monitors reactor feedwater pump turbine and the main turbine system operation and trips these turbines when excessive vibration is detected. If this system is left uncorrected and it fails because of a Y2K-related failure, it will not result in a spurious pump turbine trip or a main turbine trip. These two trips are for equipment protection only. An identical computer system has been performed on Peach Bottom Unit 2. The Unit 3 work will be performed during the next outage.	Operations	
	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually. The Unit 3 work will be performed during the next outage.	Operations	
Salem Nuclear Generating Station, Unit 1	Advanced Digital Feedwater System. This non-safety-related system controls feedwater flow rate into the steam generators, and is required for plant operation. The system is identical to the Salem Unit 2 system, which has been installed, tested, and is operational. The only part of this system affected by Y2K-related issues is an engineering workstation, which provides the human interface to the feedwater system. If this system is left uncorrected and the workstation fails because of a Y2K-related failure, the operators could adjust feedwater flow rate manually using existing control room instrumentation and controls. This upgrade has been performed on Salem Unit 2 and is scheduled for installation during the Unit 1 refueling outage.	Operations	11/6/99
	Overhead Annunciators. These components provide primary and intermediate notifications of plant equipment status and plant operating status information in the main control room. The overhead annunciators are referenced in the plant emergency operating procedures as part of the instructions for confirming plant component status. If the annunciators are left uncorrected and it fails because of a Y2K-related failure, plant equipment status would be monitored manually. Replacement of this system is outage-dependent. This upgrade has been performed on Salem Unit 2 and a similar upgrade is scheduled for the Unit 1 refueling outage.	Operations	
Salem Nuclear Generating Station, Unit 1(cont)	Plant Computer Monitoring and Alarm System. This system monitors and displays plant data for reactor operations. If this system is left uncorrected and it fails because of a Y2K-related failure, the operators would obtain needed plant information from the normal plant indications. This system is needed for operations when the reactor core coolant level is lowered to support mid-loop operations (a special refueling outage maintenance procedure for steam generator maintenance). There are no regulatory requirements for this system while the plant is at full power. This upgrade must be performed while the plant is in an outage. This upgrade has been performed on Salem Unit 2 and a similar upgrade is scheduled for the Unit 1 refueling outage.	Operations	11/6/99
Salem Nuclear Generating Station, Units 1 and 2	Plant Training Simulator. The plant training simulator provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding on site training facility capabilities, and plant operator training schedules could be affected. The licensee is upgrading the plant simulator with the same software being used to upgrade the SPDS.	Admin.	10/29/99
	Emergency Response Data System (ERDS). This PC-based system sends emergency response data information to the NRC and local authorities. If this system is left uncorrected and it fails because of a Y2K-related failure, the licensee would report information using existing plant emergency operating procedures. The licensee is waiting for a replacement engineer workstation to be delivered.	Admin.	
Three Mile Island Nuclear Station, Unit 1	Digital Turbine Control System. This system controls steam flow to the plant main turbine. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. A replica simulation of the digital turbine control system was configured and tested in the designer/supplier's shop to demonstrate the system is Y2K ready.	Operations	10/21/99
	REM/AACS/CISCO. This system manages personnel radiation exposures and controls access to radiologically controlled areas. If this system is left uncorrected and it fails because of a Y2K-related failure, control of radiation exposure and access would be tracked manually.	Admin.	

Table 3 Fuel Fabrication and Gaseous Diffusion Plant Systems and Components Requiring Completion of

Year 2000 Readiness Activities as of October 1, 1999

Site	Is The Site Y2K Ready	Will Site be Operating During Y2K Transition?	Systems That Need to be Made Y2K Ready	When Will Site be Y2K Ready?
AlliedSignal[1]	Yes	No	N/A	07/01/99
BXW Technologies	No	No	Badging and access systems Nuclear Criticality Safety Analysis Server	11/01/99
Combustion Engineering-Hematite	Yes	Unknown	N/A	07/01/99
Framatome Cogema Fuels	Yes	No	N/A	07/01/99
General Electric-Wilmington	Yes	No	N/A	09/01/99
Nuclear Fuel Services	No	Unknown	Nuclear Material Management and Safeguards System Bioassay analysis software	11/01/99
Siemens Power Corporation	No	Unknown	Inventory Control and Maintenance Tracking System Material Control and Accounting System Primary Process Control System for the Dry Conversion Process	11/01/99
United States Enrichment Corporation	Yes, for both GDPs	Yes, for both GDPs	N/A	07/01/99
Westinghouse Electric Company	No	No	Chemical Area Manufacturing Processing System Westinghouse Accountability, Tracking, and Traceability System	11/01/99

[1] Allied Signal responded that they would be Y2K Compliant by 12/31/99; however in a telephone conversation they indicated that they were Y2K Ready by July 1, 1999. A letter dated 8/16/99 confirmed that Allied Signal wasY2K ready by 8/2/99.

Amplifying Notes: (1) NRC inspected the Y2K status at the facilities in 1997 and 1998, in conjunction with other safety inspections

(2) NRC conducted follow-up Y2K inspections at the Portsmouth GDP in August 1999 and at the Paducah GDP in September 1999

(3) NRC will have cognizant staff in the Operations Center to respond to the facilities during the Y2K transition on December 31, 1999

(4) NRC will have a resident inspector at each GDP during the Y2K transition on December 31, 1999

(5) NRC will have cognizant staff in the RIV IRC to respond to the facilities during the Y2K transition on December 31, 1999

United States Nuclear Regulatory Commission

Status Report on Year 2000 Activities for November 1999

INTRODUCTION

This report is the eleventh periodic report on the status of agency Y2K activities. The report covers the period from October 1 through October 31, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

After the period covered by this report, the NRC received a report from Joseph M. Farley Nuclear Plant, Unit 2, that it was Y2K ready. Therefore, all 103 nuclear power plants are now Y2K ready.

As previously reported, by July 1, 1999, all 103 operating nuclear power plants reported status of Y2K readiness to the NRC. Regarding NRC's highest priority the uninterrupted performance of plant safety systems all nuclear power plants reported that their efforts were complete, and that no remaining Y2K-related problems existed that could directly affect the performance of safety systems or the capability for safe shutdown. Sixty-eight of these plants had also completed the next order of priority as of July 1, stating that all of their computer systems that support plant operation were "Y2K ready." The remaining 35 plants reported that, to be fully Y2K ready, they still had additional work to complete on a few non-safety computer systems or devices. Typically, the remaining Y2K work was awaiting a scheduled plant outage or the delivery of a replacement component. In each case, the licensees with work remaining provided schedules for completing that work.

As noted in previous reports, the staff had sent letters to the licensees of 12 facilities that were not expected to be Y2K ready by September 30, 1999, to confirm their completion schedules and tasks for remaining work. The staff determined that these plants with Y2K work remaining were continuing to progress toward Y2K readiness. In fact, by September 30, we received licensee reports indicating that only 10 of the 12 plants had Y2K work remaining and 93 plants were Y2K ready. During October, we received letters indicating that Y2K ready status had been achieved by Comanche Peak 1& 2, D.C. Cook 1 & 2, Hope Creek 1, Peach Bottom 3, Salem 1 & 2, and Three Mile Island 1. Therefore, as of November 1, the NRC has received Y2K readiness status reports from licensees indicating that 102 of the 103 nuclear power plants are Y2K ready. The remaining plant, Farley 2, was scheduled to be ready by December 16; however, as noted earlier in this section, NRC received a report from Farley 2 and on November 4 confirmed that it was Y2K ready. Therefore, all 103 nuclear power plants are now Y2K ready. Table 1 provides a summary of nuclear power plant (NPP) Y2K readiness status as of November 1.

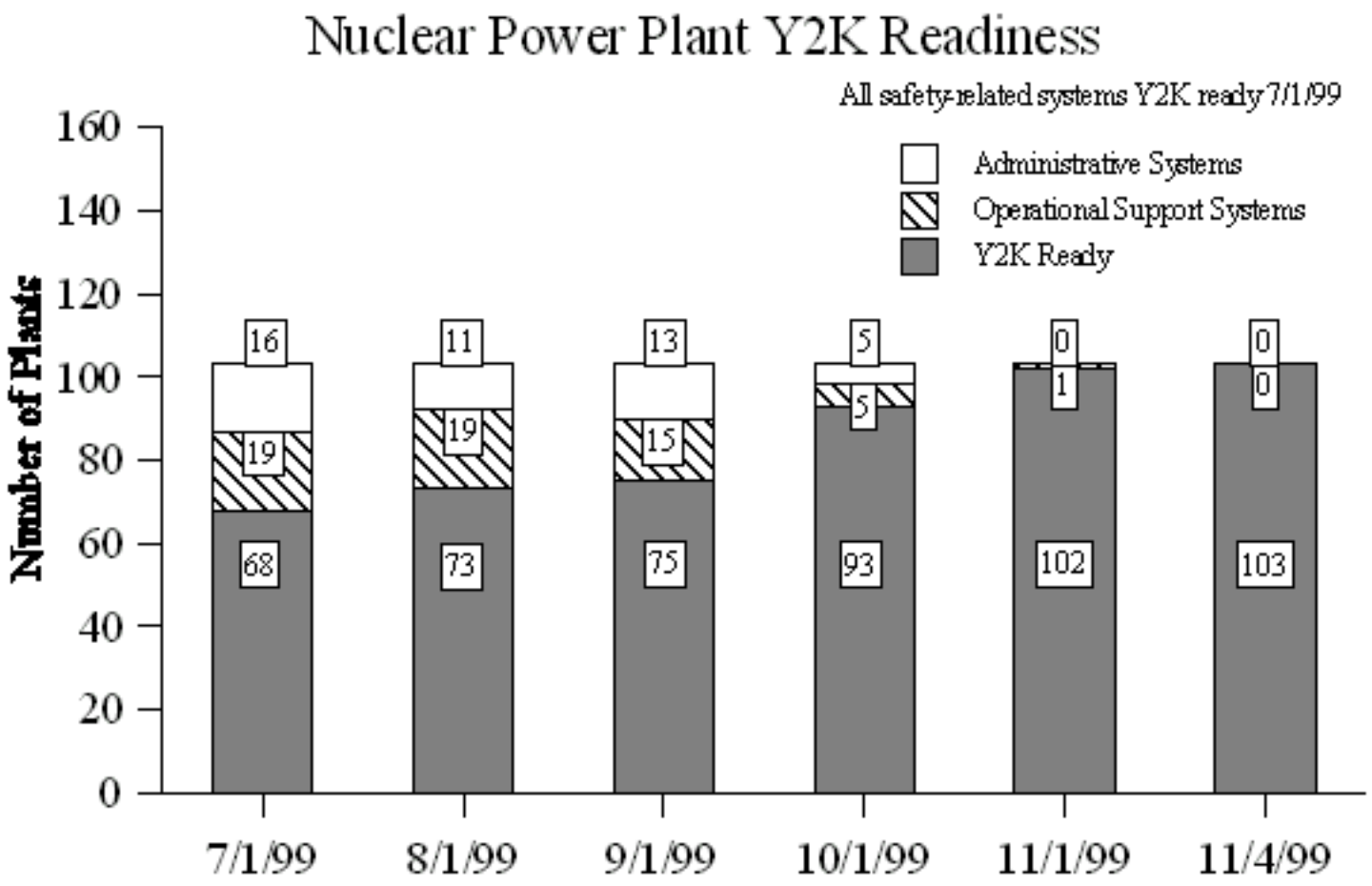


Table 2 provides a summary of NPP systems and components requiring completion of Y2K readiness activities as of November 1. The preceding chart illustrates plant readiness.

The solid shaded regions of the chart represent the number of NPPs that are already Y2K ready or are scheduled to be Y2K ready on the corresponding date. The diagonally shaded regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and have systems to be remediated that could affect power operations. (Remediation is defined in Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 98-07 "Nuclear Utility Year 2000 Readiness Contingency Planning" as the process of retiring, replacing, or modifying software or devices that have been determined to be affected by the Y2K problem.) The unshaded regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and that have only systems that could affect NPP administrative functions.

The staff will continue its efforts to confirm completion of scheduled items. In addition, the staff will continue to review Y2K contingency plans and day-one plans, using guidance in the implementing procedures for the NRC Y2K Contingency Plan. At this time, we believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond, and we do not anticipate the need for the NRC to direct any plant-specific action.

OTHER Y2K RELATED ACTIVITIES

The staff provided Y2K readiness status and contingency planning details to the Government Accounting Office (GAO) for their testimony before the House Subcommittee on Technology and Subcommittee on

Government, Management, Information, and Technology. The staff also provided GAO with written responses to a series of Y2K related questions.

The staff prepared testimony and briefed the Deputy Executive Director for Regulatory Programs on Y2K readiness activities and readiness status, including contingency planning, of nuclear power plants in preparation for an October 26 hearing with the House Subcommittee on Technology and Subcommittee on Government, Management, Information, and Technology (This was the same hearing at which GAO testified). The purpose of the hearing was to provide a status report on the Y2K readiness of reactors and the reliability of the grid throughout the Y2K transition. In addition to the testimony the staff prepared a series of questions and answers related to Y2K and other current activities.

The staff responded to Y2K related controlled correspondence from Representatives Don Young, Don Sherwood, and John Tierney. Additionally, the staff responded to Y2K related inquiries from the California Office of Emergency Services, Emergency Services Coordinator, regarding nuclear power plants in California.

The Office of Nuclear Reactor Regulation (NRR) staff participated in the October 15, NRC Y2K Contingency Plan exercise (discussed in a following section).

The draft implementing procedure for Y2K-related Notices of Enforcement Discretion (NOEDs) for inclusion in the NRC Contingency Plan was completed and made available to the public before the October 15 exercise and is discussed in a following section of this report. This procedure contains the process for granting Y2K-related and other NOEDs during the Y2K transition, the delegation of authority memorandum from the Director of NRR, the staffing plan, a sample NOED processing worksheet, and examples of possible NOED scenarios. The staff also prepared responses to individuals who provided comments on the Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition. The procedure will be finalized and formally provided to all licensees after lessons-learned from the exercise are incorporated.

During the last week of October the staff participated in the NUSMG 21st Semi-Annual Workshop entitled, "Software Project Controls & Software Configuration Management," hosted by the New York Power Authority. A presentation on the NRC's Y2K activities and various other Y2K related issues was given. Lessons learned from Y2K programs were also discussed with NUSMG representatives. Additionally, on October 26-28, the staff participated in the EPRI 7th Y2K Embedded Systems Workshop in San Diego.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

An Office of Nuclear Material Safety and Safeguards (NMSS) inspection report for the Y2K inspection at the Paducah Gaseous Diffusion Plant has been completed. A summary of the report will be placed on the NMSS Y2K website.

NMSS staff participated in the October 6, NRC Y2K Contingency Plan Exercise training.

NMSS management and staff participated in the NRC Y2K Contingency Plan Exercise on October 15, at the Headquarters Operations Center, the Region IV Incident Response Center, and at the Paducah Gaseous Diffusion Plant.

NMSS provided updated Y2K information for the EDO testimony for the Congressional Hearing on

October 26, as well as providing answers to original and supplemental Y2K questions from the GAO for their testimony.

An updated status of the Y2K readiness of fuel cycle facilities as of November 1, is provided as Table 3.

CONGRESSIONAL INTERACTION

As mentioned in an earlier section, on October 26, a hearing was conducted jointly by the House Science Committee's Subcommittee on Technology and the Government Reform Committee's Subcommittee on Government Management, Information, and Technology on "Y2K and Nuclear Power: Will Reactors React Responsibly?" Frank Miraglia, the Deputy Executive Director for Reactor Programs, testified for the NRC, along with GAO and the Nuclear Energy Institute. NRC's testimony described the agency's Y2K program for licensees and responded to GAO's recommendations for additional actions. Questions were received regarding NRC's audits of facilities, contingency plans, embedded chips, and foreign reactors. Members appeared satisfied that the purpose of the hearing, to reassure the public that U.S. nuclear power plants were prepared for the Y2K transition, had been met.

CONTINGENCY PLANNING AND INTERNATIONAL PROGRAMS

A full scale exercise was conducted on October 15, to validate the readiness of the NRC to execute the provisions of the NRC's Y2K Contingency Plan for the Nuclear Industry. During the first phase of the exercise, an NRC "early warning" team monitored information reported by nuclear power plant regulators in other nations, most of which would experience the Y2K transition in advance of the U.S. information on infrastructure concerns (i.e., electric grid and telecommunications). Plant operations information was provided through an Internet based Y2K early warning system (YEWS) developed by NRC and supported by the Nuclear Energy Agency. Regulators from Austria, Belgium, Canada, Finland, France, Germany, Japan, South Korea, the Netherlands, Spain, Switzerland, and Taiwan participated by entering information into this system simulating potential Y2K problems. NRC nuclear power plant licensees were able to access this information, on a read-only basis, to monitor for potential problems at foreign nuclear power plants similar in design to their own.

The second phase of the exercise commenced at 10:00 a.m. and focused on potential problems at NRC licensed facilities. In preparation for this second phase of the exercise, NRC assembled a Y2K response team that included staff in the Headquarters Operations Center, the Regional Incident Response Centers, and the participating nuclear power plant sites. Licensee participants from eleven reactor sites and three fuel cycle facilities presented challenges ranging from requests for enforcement discretion to plant upsets resulting in an NRC emergency response activation. In some cases, licensee participants conducted internal Y2K exercises in parallel with this exercise. About two hours into the exercise, a Y2K related failure involving the Headquarters Operations Center was simulated, necessitating a transfer of all Headquarters functions to the back up Operations Center in Region IV. The back up Operations Center assumed the lead role for NRC response and exercised their ability to assume the vital headquarters response roles.

Throughout the exercise, a mock White House Information Coordination Center (ICC) was operated in the NRC Auditorium. The personnel who will represent the NRC at the ICC had the opportunity to test the procedures for communicating and sharing data between the Operations Center, the Back up Operations Center and the ICC. Frank Miraglia, the senior Agency spokesperson at the ICC held a press conference and answered questions from the mock media--journalism students from American

University who pretended to be in the ICC Joint Public Information Center.

Throughout the course of the exercise the NRC was effective in responding to several emergencies and multiple enforcement discretion requests. Although the exercise was considered a success, it did highlight several areas for improvement. The staff has posted the major lessons learned on the NRC Y2K web site based on comments from NRC responders, exercise observers and the participating utilities. Actions for ensuring that necessary improvements are addressed are being actively tracked.

In the wake of the exercise several comments on improving YEWS were put forward and work on implementing these proposals is underway. Efforts are also underway to broaden the membership base of YEWS which currently includes the following countries: Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Korea (Republic Of), Mexico, Netherlands, Norway, Portugal, Romania, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, and the United States of America.

The staff participated in a baseline exercise at the White House ICC on November 3 and 4, and plans to participate in a stressed exercise on December 8. The baseline exercise focused on the ICC Operations Center and involved the Technical Communicator and the Information Technology Support Specialist. For the stressed exercise, the ICC Joint Public Information Center (JPIC) will be incorporated as well. During this exercise, the NRC Senior Spokesperson and Senior Public Affairs Official in the ICC JPIC will work with the NRC team in the ICC Operations Center to deal with a number of simulated Y2K concerns affecting the NRC. This will involve coordination with other Federal Agencies at the ICC and communication with the NRC Operations Center. The staff plans to use the December 8 ICC exercise to test certain aspects of the Y2K Contingency Plan that were not fully tested on October 15. For example, the staff plans to simulate the interface with the actual ICC--not a mock ICC as was done during the October 15 exercise. In some areas, changes that have been implemented based on the lessons learned from the October 15 exercise will also be tested. For example, the staff plans to demonstrate that it can obtain plant status information and enter it into YEWS in a more rapid manner. In addition, the ability of the "early warning team" to obtain, analyze, and coordinate information from various foreign sources (including YEWS) will also be tested.

In recent months, as confidence in the Y2K readiness of private and government entities within the United States has grown, concern has shifted toward potential international problems. Consequently, the President's Council on Y2K has requested federal agencies to provide information about their legal authority to provide assistance to organizations outside the United States Government in the reconstitution of critical systems that experience Y2K problems. The staff is preparing an NRC response in this regard. On a related matter, the staff has been working with their counterparts in the Department of State, the Department of Energy, and the Environmental Protection Agency to discuss how information on foreign nuclear facility problems that could potentially be received during the Y2K transition will be validated and coordinated (There is a heightened awareness of this issue based on the experience of the recent Japanese criticality event). Finally, at the request of DOE, the NRC sent a representative from IRO to Moscow to observe a Y2K Contingency Planning exercise involving the Kursk nuclear power plant. A separate trip report highlighting the observations from this exercise will be provided separately to the Commission.

PUBLIC AFFAIRS AND Y2K COMMUNICATIONS ACTIVITIES

During the month of October 1999, the NRC Web site saw a lower demand for Year 2000 information.

The NRC Year 2000 Page dropped from 24th to 26th most requested page on the NRC Web site, but it remains among the top ten most popular single entry pages. A single entry page indicates a visitor knows exactly where to look, meaning the page was either bookmarked or the address was taken from another source, such as a press release.

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," (an Adobe Acrobat file) dropped from 4th to 6th most downloaded file on the NRC Web site. This report has replaced the NRC Y2K Contingency Plan on the agency's list of top 10 downloads (the Contingency Plan is now in 15th place).

The Office of Public Affairs (OPA) provided the NRC's staffing plans to the Y2K Council's Information Coordination Center (Joint Public Information Center) and has developed a public affairs communications plan.

During October, the OPA issued one press release on Y2K--

- On Oct. 19, NRC issued a press release on the October 15, 1999, full-scale emergency preparedness exercise in preparation for Y2K

Attachments:

1. Table 1, "NPP Y2K Readiness Status as of November 1, 1999"
2. Table 2, "NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of November 1, 1999"
3. Table 3, "Fuel Fabrication and Gaseous Diffusion Plant Systems and Components Requiring Completion of Year 2000 Readiness Activities as of November 1, 1999"

Table 1 NPP Y2K Readiness Status of November 1, 1999

NPP Name	**NPP Licensee**	**Readiness Status/Date**
Arkansas Nuclear One, Units 1 and 2	Entergy Operations, Inc.	Y2K Ready
Beaver Valley Power Station, Units 1 and 2	Duquesne Light Company	Y2K Ready
Braidwood Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Browns Ferry Nuclear Power Station, Units 2 and 3	Tennessee Valley Authority	Y2K Ready
Brunswick Steam Electric Plant, Units 1 and 2	Carolina Power and Light Company	Y2K Ready
Byron Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Callaway Plant, Unit 1	Union Electric Company	Y2K Ready
Calvert Cliffs Nuclear Power Plant, Units 1 and 2	Baltimore Gas and Electric Company	Y2K Ready
Catawba Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Clinton Power Station, Unit 1	Illinois Power Company	Y2K Ready
Comanche Peak Steam Electric Station, Unit 1	Texas Utilities Electric Company	Y2K Ready
Comanche Peak Steam Electric Station, Unit 2	Texas Utilities Electric Company	Y2K Ready

Cooper Nuclear Station	Nebraska Public Power District	Y2K Ready
Crystal River Unit 3 Nuclear Generating Plant	Florida Power Corporation	Y2K Ready
Davis-Besse Nuclear Power Station, Unit 1	First Energy Services Corporation	Y2K Ready
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Pacific Gas and Electric Company	Y2K Ready
Donald C. Cook Nuclear Plant, Units 1 and 2	Indiana Michigan Power Company	Y2K Ready
Dresden Nuclear Power Station, Units 2 and 3	Commonwealth Edison Company	Y2K Ready
Duane Arnold Energy Center	IES Utilities, Inc.	Y2K Ready
Edwin I. Hatch Nuclear Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Enrico Fermi Atomic Power Plant, Unit 2	Detroit Edison Company	Y2K Ready
Fort Calhoun Station, Unit 1	Omaha Public Power District	Y2K Ready
Grand Gulf Nuclear Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
H. B. Robinson Plant, Unit 2	Carolina Power and Light Company	Y2K Ready
Hope Creek Nuclear Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	Y2K Ready
Indian Point Unit No. 2	Consolidated Edison Company of New York, Inc.	Y2K Ready
Indian Point Station, Unit 3	Power Authority of the State of New York	Y2K Ready
James A. FitzPatrick Nuclear Power Plant	Power Authority of the State of New York	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 1	Southern Nuclear Operating Company, Inc.	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 2	Southern Nuclear Operating Company, Inc.	12/16/99
Kewaunee Nuclear Power Plant	Wisconsin Public Service Corporation	Y2K Ready
LaSalle County Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Limerick Generating Station, Unit 1	PECO Energy Company	Y2K Ready
Limerick Generating Station, Unit 2	PECO Energy Company	Y2K Ready
Millstone Nuclear Power Station, Units 2 and 3	Northeast Nuclear Energy Company	Y2K Ready
Monticello Nuclear Generating Plant	Northern States Power Company	Y2K Ready
Nine Mile Point Nuclear Station, Units 1 and 2	Niagara Mohawk Power Corporation	Y2K Ready
North Anna Power Station, Unit 1	Virginia Electric and Power Company	Y2K Ready
North Anna Power Station, Unit 2	Virginia Electric and Power Company	Y2K Ready
Oconee Nuclear Station, Units 1, 2, and 3	Duke Energy Corporation	Y2K Ready
Oyster Creek Nuclear Generating Station	GPU Nuclear Corp.	Y2K Ready
Palisades Nuclear Plant	Consumers Energy Company	Y2K Ready
Palo Verde Nuclear Generating Station, Units 1, 2, and 3	Arizona Public Service Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 2	PECO Energy Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 3	PECO Energy Company	Y2K Ready

Perry Nuclear Power Plant, Unit 1	First Energy Nuclear Operating Company	Y2K Ready
Pilgrim Nuclear Power Station, Unit 1	Boston Edison Company	Y2K Ready
Point Beach Nuclear Plant, Units 1 and 2	Wisconsin Electric Power Company	Y2K Ready
Prairie Island Nuclear Generating Plant, Units 1 and 2	Northern States Power Company	Y2K Ready
Quad Cities Nuclear Power Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
River Bend Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
Robert Emmet Ginna Nuclear Plant, Unit 1	Rochester Gas and Electric Corp.	Y2K Ready
Salem Nuclear Generating Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	Y2K Ready
Salem Nuclear Generating Station, Unit 2	Public Service Electric and Gas Co. of New Jersey	Y2K Ready
San Onofre Nuclear Generating Station, Units 2 and 3	Southern California Edison Company	Y2K Ready
Seabrook, Unit 1	North Atlantic Energy Service Corporation	Y2K Ready
Sequoyah Nuclear Plant, Units 1 and 2	Tennessee Valley Authority	Y2K Ready
Shearon Harris Nuclear Power Plant, Unit 1	Carolina Power and Light Company	Y2K Ready
South Texas Project Electric Generating Station, Units 1 and 2	South Texas Project Nuclear Operating Company	Y2K Ready
St. Lucie Plant, Units 1 and 2	Florida Power and Light Company	Y2K Ready
Surry Power Station, Units 1 and 2	Virginia Electric and Power Company	Y2K Ready
Susquehanna Steam Electric Station, Units 1 and 2	Pennsylvania Power and Light Company	Y2K Ready
Three Mile Island Nuclear Station, Unit 1	GPU Nuclear Corp.	Y2K Ready
Turkey Point Plant, Units 3 and 4	Florida Power and Light Company	Y2K Ready
Vermont Yankee Nuclear Power Station	Vermont Yankee Nuclear Power Corporation	Y2K Ready
Virgil C. Summer Nuclear Station, Unit 1	South Carolina Electric & Gas Company	Y2K Ready
Vogtle Electric Generating Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Washington Public Power Supply System Nuclear Project No. 2	Washington Public Power Supply System	Y2K Ready
Waterford Steam Electric Station, Unit 3	Entergy Operations, Inc.	Y2K Ready
Watts Bar Nuclear Plant, Unit 1	Tennessee Valley Authority	Y2K Ready
William B. McGuire Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Wolf Creek Generating Station	Wolf Creek Nuclear Operating Corporation	Y2K Ready

All safety-related systems are Y2K ready.

Table 2 - NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of November 1, 1999

NPP	NPP System and Completion Activities	**NPP System Type**	**Completion Date**
Joseph M. Farley Nuclear Plant, Unit 2	Unit 2 Turbine Digital Electrohydraulic Controller. This system controls steam flow to the plant main turbine, and provides turbine overspeed protection. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. This system was successfully installed on Unit 1 and was tested for Y2K dates. Remediation of this system is scheduled for a plant refueling outage from October 16 to December 16, 1999[(1)].	Operations	12/16/99

All safety-related systems are Y2K ready.

Table 3 - Status of Year 2000 Readiness Activities at Fuel Cycle Facilities as of November 1, 1999

Site	Type of Facility [1]	Is Site Y2K Ready?	Will Site be Operating During Y2K Transition?	Does Site have Plans for Controlled Startup after Y2K Transition?	Systems That Need to be Made Y2K Ready	When Will Site be Y2K Ready?
AlliedSignal	UF6	Yes	No	Yes	N/A	07/01/99
BXW Technologies	HEU	Yes	No	No (will have soon)	N/A	11/01/99
Combustion Engineering-Hematite	LEU	Yes	No	Yes	N/A	07/01/99
Framatome Cogema Fuels	LEU	Yes	No	Yes	N/A	07/01/99
General Electric-Wilmington	LEU	Yes	No	Yes	N/A	09/01/99
Nuclear Fuel Services	HEU	Yes	No	Yes	N/A	11/01/99
Siemens Power Corporation	LEU	Yes	No	Yes	N/A	11/01/99
United States Enrichment Corporation	GDP	Yes, for both facilities	Yes, for both facilities	N/A	N/A	07/01/99
Westinghouse Electric Company	LEU	No	No	Yes	Chemical Area Manufacturing Processing System (ChAMPS) [2] Westinghouse Accountability, Tracking, and Traceability System	12/15/99

1 Legend:

GDP = Gaseous Diffusion Enrichment Facility HEU = High Enriched Uranium Fuel Fabrication Facility

LEU = Low Enriched Uranium Fuel Fabrication Facility UF6 = Uranium Hexafluoride Production Facility

2 Westinghouse:

The current Item Control System (ICS) that will be replaced by ChAMPS will not be Y2K ready until February 2000. If ChAMPS and the backup systems in the contingency plan do not work, then the current ICS would be used next in April 2000. Otherwise, the current ICS will be eliminated in April 2000.

Notes:

- NRC inspected the Y2K status at the facilities in 1997 and 1998, in conjunction with other safety inspections
- NRC conducted follow-up Y2K inspections at the Portsmouth GDP in August 1999 and at the Paducah GDP in September 1999
- NRC will have cognizant staff in the HQ Operations Center to respond to the facilities during the Y2K transition on December 31, 1999
- NRC will have cognizant staff in the Region IV IRC to respond to the facilities during the Y2K transition on December 31, 1999
- NRC will have a resident inspector at each GDP and HEU during the Y2K transition on December 31, 1999

1. After the period covered by this report, the NRC received a report from Joseph M. Farley Nuclear Plant, Unit 2, and on November 4, confirmed that it was Y2K ready.

United States Nuclear Regulatory Commission Status Report on Year 2000 Activities for May 1999

INTRODUCTION

Over the past several months, the staff has periodically provided the Commission with status reports on Year 2000 (Y2K) activities. This report is the fifth periodic report and updates the status of agency Y2K activities. The report covers the period from 1 April to 30 April. Additional, more detailed, Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

The staff recently completed its review of the public comments related to the Nuclear Information and Resource Service petitions for rulemaking regarding Y2K issues. The public comments will be considered as the staff completes its review of the petitions. The staff is preparing a Federal Register notice, Congressional letters and a Commission paper regarding the resolution of the petitions.

The staff provided several briefings on the status of the nuclear industry and agency Y2K readiness activities. These briefings included:

April 16, 1999	The President's Council Working Group on Energy/Electric Power
April 26, 1999	Electric Power Research Institute (EPRI) Y2K Embedded Systems Workshop
April 28, 1999	Nuclear Utility Software Management Group (NUSMG) Conference on Y2K Issues
April 28, 1999	Catastrophic Disaster Response Group meeting.

On April 28, 1999, the staff issued information notice IN 99-12, "Year 2000 Computer Systems Readiness Audits," to inform nuclear power plant licensees of observations made by NRC staff during audits conducted on the Year 2000 readiness programs of 12 plant sites. This document is available on the NRC's Y2K website.

The staff's proposed "Interim Policy Statement on Enforcement Discretion for Y2K" has been drafted and is currently undergoing management review. This guidance, once approved by the Commission, will provide guidelines for the staff and industry concerning the use of enforcement discretion during the Year 2000 transition period.

The staff commenced its site-specific Y2K reviews. Year 2000 activities at all 66 sites (103 nuclear power units) will be reviewed by NRC Regional staff. These reviews are scheduled to be completed by the end of July. Regional inspectors will use a checklist to review licensee Y2K readiness programs including the area of contingency planning. Headquarters staff will participate in selected reviews to assure the consistency of the reviews across all four NRC Regions. The results from these reviews will be consolidated and issued as a single report by August, 1999. The report will be made publically

available and posted at the NRC Y2K website.

In addition, the staff conducts periodic conference calls to discuss review results, help assure uniformity of the reviews, and to provide advice and clarify implementation procedures. The staff is developing the approach for evaluating the results of the Y2K site reviews, as well as the responses from the licensees to NRC Y2K generic letters.

The staff continued planning for the contingency plan audits. These audits will focus on Y2K contingency planning at six sites. These six sites will involve licensees other than those that comprised the original 12 Y2K audits. Management will participate in selected aspects of several of these audits. The audits will take place between May 17 and June 18, 1999. The six sites are:

Oconee	Indian Point 2
Palo Verde	Turkey Point
Duane Arnold	Diablo Canyon

The staff is currently developing guidelines that will be used to assist the staff in determining what additional NRC oversight activities, if any, are appropriate for those plants that will not be Y2K ready by July 1, 1999.

Finally, although GL 98-01 was addressed to: "All holders of operating licenses for nuclear power plants, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel," the staff plans to evaluate the need to assess Y2K issues and licensee readiness at decommissioned and permanently shutdown facilities.

The industry continues to be actively engaged in addressing the Y2K problem. On April 30, 1999, the North American Electric Reliability Council (NERC) released its First Quarter 1999 status report on "Preparing the Electric Power Systems of North America for Transition to the Year 2000." This report is located on the NERC website at http://www.nerc.com.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

The staff has completed updating the materials and fuel cycle portion of the NRC's Y2K website. The front page has more information regarding materials-related Y2K activities. Useful links to other Y2K websites have been added.

The staff has drafted two materials-related Y2K Information Notices (INs). The first IN updates licensees on the staff's Y2K activities and provides website addresses for Y2K information. The second IN emphasizes the importance of Y2K contingency plans. Both INs will be issued by mid-May.

The staff plans to conduct follow-up Y2K reviews at the gaseous diffusion plants. In addition, the staff contacted the licensee for the Paducah gaseous diffusion plant regarding participation in the NRC's October Y2K exercise. Paducah indicated that they are interested in participating.

CONTINGENCY PLANNING

The NRC Y2K Contingency Planning Task Force continued to develop and refine the NRC Y2K contingency plan based on stakeholder feedback and the February 19, 1999 Staff Requirements

Memorandum (SRM). The final agency Y2K Contingency Plan is currently undergoing management review and is expected to be forwarded to the Commission by mid-May.

A Y2K Contingency Plan table top exercise involving NRC, Baltimore Gas and Electric (BGE), the State of Maryland and counties surrounding the Calvert Cliffs Nuclear Power Plant is tentatively planned for July 14, 1999. On October 15, 1999, the NRC staff plans to exercise the agency's Y2K Contingency Plan. Commonwealth Edison is coordinating the exercise play from a half dozen nuclear power plant licensees. This exercise will also test the back-up communications systems, including newly procured NRC satellite phones. The staff's consultant recently completed a cost-benefit analysis of the available satellite communication options.

PUBLIC AFFAIRS AND Y2K COMMUNICATION ACTIVITIES

The staff continued to respond to inquiries regarding Y2K activities provided comments and input for the frequently-asked questions (FAQs) about Y2K issues. The FAQs and answers have been posted at the NRC Web site.

As of the end of April, the NRC Web site was responding to approximately 3,800 page-requests per week for Year 2000 information - down from 5,800 page-requests per week for mid- March. Currently, the most frequently-requested pages are:

NRC Year 2000 Page	44 percent of Y2K requests
Nuclear Reactors Y2K Page	11 percent of Y2K requests
Y2K Contingency Planning Page	10 percent of Y2K requests
April 1999 EDO Y2K Status Report	7 percent of Y2K requests
NRC Y2K Contingency Plan	7 percent of Y2K requests
Y2K Frequently Asked Questions	6 percent of Y2K requests
February 1999 OMB Y2K Status Report	4 percent of Y2K requests
NRC Y2K References Page	4 percent of Y2K requests

A small number (less than ten requests per day) are being received for the final version of NRC Inspection Manual Temporary Instruction TI-2515/141 (Review of Year 2000 Readiness of Computer Systems at Nuclear Power Plants). Requests for reports on the twelve previously-completed Y2K audits of nuclear power plants are also very low (5 to 7 requests per day for each report).

United States Nuclear Regulatory Commission

Status Report on Year 2000 Activities for September 1999

INTRODUCTION

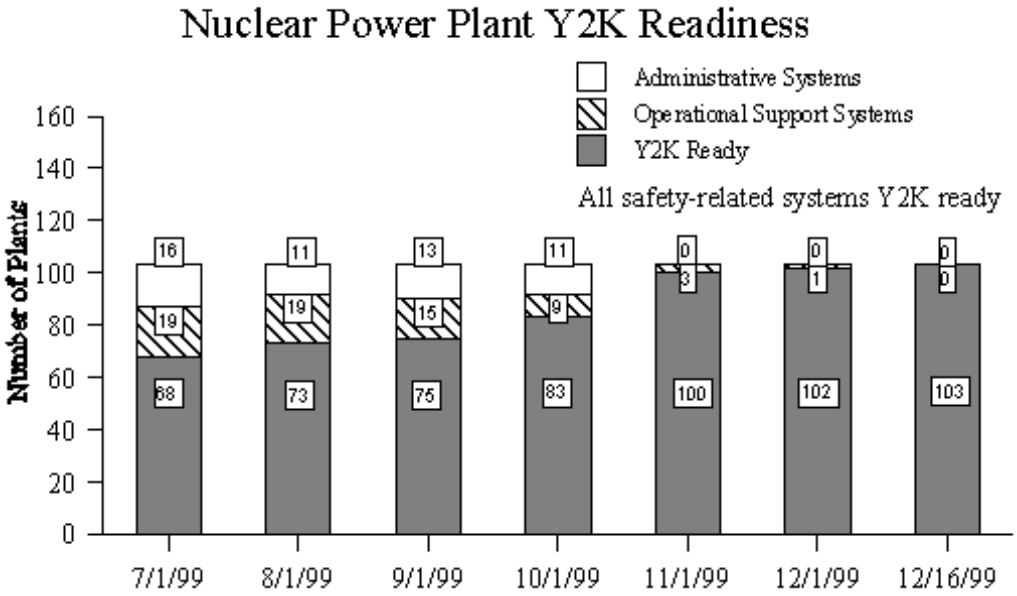
This report is the ninth periodic report on the status of agency Y2K activities. The report covers the period from August 1 through August 31, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html

POWER REACTORS

As previously reported, by July 1, 1999, all 103 operating nuclear power plants reported status of Y2K readiness to the NRC. Regarding NRC's highest priority - the uninterrupted performance of plant safety systems - all nuclear power plants report that their efforts are complete, and that no remaining Y2K-related problems exist that could directly affect the performance of safety systems or the capability for safe shutdown. Sixty-eight of these plants had also completed the next order of priority as of July 1, stating that all of their computer systems that support plant operation are "Y2K ready." The remaining 35 plants reported that, to be fully Y2K ready, they still have additional work to complete on a few non-safety computer systems or devices.

By August 31, 1999, 75 plants are Y2K ready. Table 1 (Attachment 1) provides a summary of nuclear power plant (NPP) Y2K readiness status. Table 2 (Attachment 2) provides a summary of NPP systems and components requiring completion of Y2K readiness activities. The information in Tables 1 and 2 has been extracted from the forthcoming NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," that was issued on September 7, 1999. Fifteen plants have work remaining on systems impacting power generation, thirteen plants have work remaining on monitoring or administrative systems including one plant that requires its contingency plan to be completed before becoming Y2K ready. Typically, the remaining Y2K work is waiting on a scheduled plant outage or the delivery of a replacement component. In each case, the licensees with work remaining have provided schedules for completing that work. The NRC will continue to monitor progress at those plants that have remaining work to be performed and will independently verify completion of these items, including Y2K contingency plans. By September 30, 1999, we will make a final determination whether additional regulatory action is warranted to address Y2K readiness issues. At this time, we believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond, and we do not anticipate the need for the NRC to direct any plant-specific action.

The status of NPP Y2K readiness is shown in the following figure. The solid shaded regions of the chart represent the number of NPPs that are already Y2K ready or are scheduled to be Y2K ready on the corresponding date. The diagonally shaded regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and have systems to be remediated that could affect power operations. (Remediation is defined in NEI/NUSMG 98-07 as the process of retiring, replacing, or modifying software or devices that have been determined to be affected by the Y2K problem.) The unshaded regions of the chart represent the number of NPPs that are not scheduled to be Y2K ready on the corresponding date, and that have only systems that could affect NPP administrative functions.



Results of NRC conducted onsite reviews of licensee Y2K programs at the 103 nuclear power plants, additional staff assessment of followup reviews of 14 plants, and updated information relating to plant-specific reviews will be provided in NUREG-1706.

FOLLOWUP INSPECTIONS

The staff conducted reviews of licensee Y2K program implementations at all 103 operating NPP sites between April 1999 and July 1999. In some cases, staff reviews were performed before the licensees had completed all phases of their Y2K programs. For example, many licensees did not complete integrated contingency planning activities until late June 1999, but were reviewed by the staff in May or early June. Consequently, these licensees could not provide the staff sufficient information at the time of the initial review for the staff to conclude that the licensee's integrated contingency planning process was consistent with industry guidance.

The staff identified 14 of the 103 operating NPPs that required additional staff follow-up reviews in order for the staff to evaluate more fully each phase of the licensee's Y2K program. The staff's follow-up review activities were conducted between July 1, 1999, and August 13, 1999, and addressed only those portions of the applicable Temporary Instruction (TI) 2515/141 acceptance criteria that could not be evaluated during the staff's initial review, or that required additional clarification regarding the manner of implementing certain Y2K activities. Specifically, the staff reviewed detailed assessment activities and contingency planning activities at eight NPPs, only detailed assessment activities at two NPPs, and only contingency planning activities at four NPPs. The NPPs receiving staff follow-up reviews were:

- Arkansas Nuclear One, Units 1 and 2
- Beaver Valley Power Station, Units 1 and 2
- Cooper Nuclear Station
- Grand Gulf Nuclear Station, Unit 1
- Indian Point Unit No. 2
- Prairie Island Nuclear Generating Plant, Units 1 and 2
- River Bend Station, Unit 1
- Three Mile Island Nuclear Station, Unit 1
- Vermont Yankee Nuclear Power Station
- Virgil C. Summer Nuclear Station, Unit 1
- Waterford Steam Electric Station, Unit 3

In 13 of the 14 reviews, the staff was able to conclude that the licensees were following a program that was consistent with industry guidance. In reviewing the integrated contingency planning activities at Cooper Nuclear Station (CNS), the staff determined that the licensee's Integrated Contingency Plan (ICP) was not sufficiently complete for the staff to conclude that CNS was fully Y2K ready, although all safety-related systems and components were Y2K ready. The licensee provided a completion date of September 20, 1999, for completing the ICP. The staff will review the CNS ICP upon its completion.

Additionally, during a self-initiated audit of its Y2K program implementation documents, the licensee for CNS discovered that three items had not been adequately assessed. The first item was a radiation monitor that was incorrectly classified as Y2K compliant, but was only Y2K ready. The second item was a device used for testing batteries that should have been classified as Y2K-ready instead of Y2K-compliant. The third item was a device used for testing that was omitted from the licensee's Y2K database. This device was not included in their inventory database because it is only used as a backup calibration device in case other calibration devices fail. None of these components involved systems needed to safely shut down the plant, and did not change the licensee's Y2K readiness status. The licensee is performing additional audits of its Y2K program.

On the basis of the results of the completed reviews for all 103 operating NPPs, the staff concluded that all licensees were implementing Y2K programs that were consistent with the NRC-approved industry guidance.

OTHER Y2K RELATED ACTIVITIES

The staff is working with industry to address situations where a licensee or vendor discovers that a component or equipment previously thought to be Y2K ready, is found to have a Y2K deficiency. The staff is meeting with NEI on September 10, 1999, to discuss configuration management issues regarding systems and embedded components for Y2K problems in order for the staff to gain confidence that the industry is confirming through ongoing processes that unexpected Y2K problems are dealt with and generic information shared in a timely manner.

SECY-99-162 proposed the policy for regulatory actions that the staff would take for licensees of nuclear power plants that have not completed their Y2K readiness activities, including remediation and contingency planning, by July 1, 1999. In a Staff Requirements Memorandum dated August 5, 1999, the Commission approved the proposed policy pending further clarification so that stakeholders understand that nuclear power plants will be in a stable, safe condition during the Y2K transition, and that regulatory action, where appropriate, will be taken sufficiently in advance of the Y2K rollover date (i.e., as soon as September 30, but no later than December 1, 1999). The staff is revising the policy in accordance with the Commission direction.

On the night of August 21, 1999,at 23:59:47 Universal Time Coordinated, the Global Positioning System (GPS) satellite clocks rollover for Week Number occurred. This rollover changed the week number from 1023 to 0 and reset the time to January 1, 1980. After the rollover, the GPS clock reset itself from "1023" to "0000." The staff assessed effects of this disruption in the "Time-Synchronization" feature of the GPS on safe operation of Nuclear Power Plants in USA. NRR had staff "on-call" and the Headquarters Operations Center had an extra duty officer to monitor affects of the GPS clock rollover. The Operations Center did not receive any reports of plant problems attributable to GPS

Week-Number rollover.

On August 17, 1999, NRC's response to three Rulemaking Petitions (PRM-50-65, PRM-50-66, PRM-50-67) were completed and issued and the petitioners' requests were denied. The petitions involved Shutdown of Nuclear Facilities not Compliant with Y2K issues, Y2K issues and Emergency Planning for Nuclear Facilities, and Assurance of Reliable Back-up Sources of Power for Nuclear Facilities. The letter to the Petitioner, Congressional letters, and all three FRNs have been issued. The denials for the petitions were published in the Federal Register (64FR45900, 64FR45908, 64FR45911) on August 23, 1999.

NRC responded to two controlled correspondence items on Y2K issues, one from Senator Paul Coverdell and other from Congressman Jack Kingston. By a letter dated August 16, 1999, to the Nuclear Information and Research Service (NIRS), NRC provided a clarification on the issue of black-start capability after a loss of offsite power event.

The staff is preparing responses to several individuals who provided comments on the "Interim Enforcement Policy regarding Enforcement Discretion for Nuclear Power Plants during the Year 2000 Transition."

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

The Office of Nuclear Material Safety and Safeguards (NMSS) and the Department of Energy (DOE) worked together to provide a single U.S. response to an International Atomic Energy Agency (IAEA) Y2K Safeguards Questionnaire. On August 30, 1999, NRC sent the combined NRC/DOE response to the State Department for transmittal to the U.S. mission to the IAEA.

NMSS representatives visited the Portsmouth gaseous diffusion plant (GDP) during the week of August 16, 1999, to discuss Y2K readiness activities. An NMSS inspection report on the Portsmouth visit is being drafted. NMSS representatives plan to visit the Paducah GDP during the week of September 20, 1999 to discuss Y2K readiness activities.

Based on a review of the responses to Generic Letter 98-03, a Y2K Fuel Cycle Facility Action Plan was developed to track the Y2K issue with respect to fuel cycle facilities. The elements of the plan are the two GDP inspections, telephone conversations with facilities, and updated written responses from facilities that were not Y2K ready by July 1, 1999.

NMSS was interviewed by McGraw Hill concerning the Y2K activities of fuel cycle facilities on August 31, 1999. The purpose of the interview was to confirm information that was found on the NRC Y2K website.

CONTINGENCY PLANNING

The staff continued preparations for the full scale exercise on October 15, 1999. This two-phased exercise will test all key aspects of the Y2K contingency plan. The first phase, which will begin around 6:00 a.m. will test the International Y2K monitoring team. Countries participating in the Y2K Early Warning System (YEWS) will enter information into the system, based on simulated Y2K problems. The monitoring team will then evaluate and communicate this information accordingly. The second phase, which will begin around 10:00 a.m. and last until about 2:00 p.m., will test the NRC's ability to respond to domestic Y2K problems - primarily those that involve or affect our licensees. During the second phase NRC Operations Center and the Regional Incident Response Centers will be staffed in accordance with the Y2K contingency plan. Approximately 10 nuclear plant licensees will simulate requests for enforcement discretion. In addition, at least two nuclear plant licensees and one fuel cycle facility will simulate an emergency condition because of a Y2K problem. The exercise will also involve a simulated Headquarters communication failure with transfer of critical HQ response functions to the Region IV back-up Operations Center. Back-up communication systems between NRC headquarters, the regional Incident Response Centers and the resident inspectors will also be tested. The NRC auditorium will be established as a mock joint information center (JIC) for the White House Information Coordination Center (ICC). Journalism students from a local university will play the role of the press. The NRC ICC senior spokesperson(s) will provide briefings in the auditorium (simulated ICC JIC) on the status of any Y2K problems in the nuclear industry, just as they will be expected to do, if necessary, during the Y2K transition.

The ICC plans to conduct four exercises before the Y2K transition. The first exercise, scheduled for September 8-9, 1999, will simply involve faxing the ICC information on any Y2K effects involving NRC systems. The staff is working with the ICC on the exact information that will be provided. Subsequent exercises involving use of an Internet-based system are planned as shown below.

Exercise/Seminar	DATE
FRP Table Top	May 19-20
NRC Y2K Table Top	July 14
NERC Y2K Exercise	September 8-9
Cabinet Seminar on Y2k	September 18
ICC Exercise	October 13-14
NRC Full-scale Y2k Exercise	October 15
ICC Stress Exercise	November 3-4
Final ICC Exercise	December 8-9
Implement Y2k Contingency Plan	December 31-January

IRO staff continued to work with their counterparts in the regions to ensure that the draft Y2K implementing procedures are complete and consistent. The Emergency Response Coordinator (ERC) counterpart meeting on September 29-30 will focus on Y2K issues and will include a detailed "walk-through" of the Y2K implementing procedures. The procedures will be tested during the October 15, 1999 exercise.

Iridium satellite phones were delivered to the Regions and Headquarters and are currently being tested. Training on the Iridium phones will be conducted during the upcoming ERC counterpart meeting.

NRC staff will be observing, but not participating in, the September 8-9, 1999 NERC exercise.

INTERNATIONAL PROGRAMS

The NRC conducted a video conference with the International Atomic Energy Agency (IAEA) to discuss coordination of the Y2K Early Warning System (YEWS) with the international Incident Reporting System (IRS). It was agreed that there was no duplication between the systems and that YEWS and the IRS would both fulfill important roles during the Y2K transition period.

So far twenty countries have agreed to participate in the YEWS project: Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Japan, Korea (Republic Of), Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the USA. Invitations to other countries have been issued, in particular to former Soviet republics and Russia.

Further information on YEWS can be found on the Internet at this location: http://www.nrc.gov/NRC/IP/yewsfaq.ht ml

PUBLIC AFFAIRS AND Y2K COMMUNICATION ACTIVITIES

NRC press releases were issued addressing: 1) the "Policy for Regulatory Actions for Nuclear Power Plants that are not Y2K Ready" (August 6, 1999); and 2) "NRC Denies Three Petitions from NIRS on Year 2000 Concerns" (August 27, 1999). The Commission was consulted on the former issue in staff paper SECY-99-162 and on the latter issue in staff paper SECY-99-173. Both papers are accessible on NRC's web site at: www.nrc.gov/NRC/NEWS/year2000.html

On August 3, Chairman Dicus briefed reporters at a press conference hosted by NERC and the Department of Energy held at the National Press Club to provide a status report on the Y2K readiness at nuclear power plants.

As of the end of August, the NRC Web site continues to respond to over 3,000 page-requests per week for Year 2000 information. The NRC Year 2000 Page, the NRC Y2K Contingency Planning Page, Press Release 99-168 (Regulatory Actions for Plants that are not "Y2K Ready") and Press Release 99-175 (NRC Denial of Three NIRS Petitions) are among the top 50 most frequently-requested pages on the entire NRC Web site. All four pages are also among the top 10 single-access pages, indicating visitors have either bookmarked these pages or have obtained the page address from another source.

The NRC Y2K Contingency Plan (an Adobe Acrobat file) continues to be among the agency's top 10 most frequently downloaded files.

Table 1 NPP Y2K Readiness Status as of September 1, 1999*

NPP Name	NPP Licensee	Readiness Status/Date**
Arkansas Nuclear One, Units 1 and 2	Entergy Operations, Inc.	Y2K Ready
Beaver Valley Power Station, Units 1 and 2	Duquesne Light Company	9/30/99
Braidwood Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Browns Ferry Nuclear Power Station, Units 2 and 3	Tennessee Valley Authority	10/31/99
Brunswick Steam Electric Plant, Units 1 and 2	Carolina Power and Light Company	Y2K Ready
Byron Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Callaway Plant, Unit 1	Union Electric Company	Y2K Ready
Calvert Cliffs Nuclear Power Plant, Units 1 and 2	Baltimore Gas and Electric Company	Y2K Ready
Catawba Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Clinton Power Station, Unit 1	Illinois Power Company	9/22/99
Comanche Peak Steam Electric Station, Unit 1	Texas Utilities Electric Company	11/30/99
Comanche Peak Steam Electric Station, Unit 2	Texas Utilities Electric Company	10/30/99

Cooper Nuclear Station	Nebraska Public Power District	9/20/99
Crystal River Unit 3 Nuclear Generating Plant	Florida Power Corporation	Y2K Ready
Davis-Besse Nuclear Power Station, Unit 1	First Energy Services Corporation	Y2K Ready
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Pacific Gas and Electric Company	10/31/99
Donald C. Cook Nuclear Plant, Units 1 and 2	Indiana Michigan Power Company	10/30/99
Dresden Nuclear Power Station, Units 2 and 3	Commonwealth Edison Company	Y2K Ready
Duane Arnold Energy Center	IES Utilities, Inc.	Y2K Ready
Edwin I. Hatch Nuclear Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Enrico Fermi Atomic Power Plant, Unit 2	Detroit Edison Company	Y2K Ready
Fort Calhoun Station, Unit 1	Omaha Public Power District	Y2K Ready
Grand Gulf Nuclear Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
H. B. Robinson Plant, Unit 2	Carolina Power and Light Company	Y2K Ready
Hope Creek Nuclear Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	10/29/99
Indian Point Unit No. 2	Consolidated Edison Company of New York, Inc.	Y2K Ready
Indian Point Station, Unit 3	Power Authority of the State of New York	Y2K Ready
James A. FitzPatrick Nuclear Power Plant	Power Authority of the State of New York	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 1	Southern Nuclear Operating Company, Inc.	Y2K Ready
Joseph M. Farley Nuclear Plant, Unit 2	Southern Nuclear Operating Company, Inc.	12/16/99
Kewaunee Nuclear Power Plant	Wisconsin Public Service Corporation	Y2K Ready
LaSalle County Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
Limerick Generating Station, Unit 1	PECO Energy Company	Y2K Ready
Limerick Generating Station, Unit 2	PECO Energy Company	9/30/99
Millstone Nuclear Power Station, Units 2 and 3	Northeast Nuclear Energy Company	Y2K Ready
Monticello Nuclear Generating Plant	Northern States Power Company	Y2K Ready
Nine Mile Point Nuclear Station, Units 1 and 2	Niagara Mohawk Power Corporation	Y2K Ready
North Anna Power Station, Unit 1	Virginia Electric and Power Company	Y2K Ready
North Anna Power Station, Unit 2	Virginia Electric and Power Company	10/29/99
Oconee Nuclear Station, Units 1, 2, and 3	Duke Energy Corporation	Y2K Ready
Oyster Creek Nuclear Generating Station	GPU Nuclear Corp.	9/30/99
Palisades Nuclear Plant	Consumers Energy Company	Y2K Ready
Palo Verde Nuclear Generating Station, Units 1, 2, and 3	Arizona Public Service Company	Y2K Ready
Peach Bottom Atomic Power Station, Unit 2	PECO Energy Company	9/30/99

Peach Bottom Atomic Power Station, Unit 3	PECO Energy Company	10/31/99
Perry Nuclear Power Plant, Unit 1	First Energy Nuclear Operating Company	Y2K Ready
Pilgrim Nuclear Power Station, Unit 1	Boston Edison Company	Y2K Ready
Point Beach Nuclear Plant, Units 1 and 2	Wisconsin Electric Power Company	Y2K Ready
Prairie Island Nuclear Generating Plant, Units 1 and 2	Northern States Power Company	Y2K Ready
Quad Cities Nuclear Power Station, Units 1 and 2	Commonwealth Edison Company	Y2K Ready
River Bend Station, Unit 1	Entergy Operations, Inc.	Y2K Ready
Robert Emmet Ginna Nuclear Plant, Unit 1	Rochester Gas and Electric Corp.	Y2K Ready
Salem Nuclear Generating Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	11/6/99
Salem Nuclear Generating Station, Unit 2	Public Service Electric and Gas Co. of New Jersey	10/29/99
San Onofre Nuclear Generating Station, Units 2 and 3	Southern California Edison Company	Y2K Ready
Seabrook, Unit 1	North Atlantic Energy Service Corporation	Y2K Ready
Sequoyah Nuclear Plant, Units 1 and 2	Tennessee Valley Authority	10/31/99
Shearon Harris Nuclear Power Plant, Unit 1	Carolina Power and Light Company	Y2K Ready
South Texas Project Electric Generating Station, Units 1 and 2	South Texas Project Nuclear Operating Company	10/31/99
St. Lucie Plant, Units 1 and 2	Florida Power and Light Company	Y2K Ready
Surry Power Station, Units 1 and 2	Virginia Electric and Power Company	Y2K Ready
Susquehanna Steam Electric Station, Units 1 and 2	Pennsylvania Power and Light Company	Y2K Ready
Three Mile Island Nuclear Station, Unit 1	GPU Nuclear Corp.	10/21/99
Turkey Point Plant, Units 3 and 4	Florida Power and Light Company	Y2K Ready
Vermont Yankee Nuclear Power Station	Vermont Yankee Nuclear Power Corporation	9/30/99
Virgil C. Summer Nuclear Station, Unit 1	South Carolina Electric & Gas Company	Y2K Ready
Vogtle Electric Generating Plant, Units 1 and 2	Southern Nuclear Operating Company, Inc.	Y2K Ready
Washington Public Power Supply System Nuclear Project No. 2	Washington Public Power Supply System	Y2K Ready
Waterford Steam Electric Station, Unit 3	Entergy Operations, Inc.	Y2K Ready
Watts Bar Nuclear Plant, Unit 1	Tennessee Valley Authority	10/31/99
William B. McGuire Nuclear Station, Units 1 and 2	Duke Energy Corporation	Y2K Ready
Wolf Creek Generating Station	Wolf Creek Nuclear Operating Corporation	Y2K Ready

Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999*

NPP	NPP System and Completion Activities	NPP System Type	Completion Date**
Beaver Valley Power Station, Units 1 and 2	Atmospheric Radioactive Effluent Release Assessment System (ARERAS). This system calculates environmental releases using data from the plant process monitoring and trending computers and the meteorological tower instruments. The ARERAS performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, safety status or generation capability of the plant would not be affected, but it could result in the loss of automatic calculation of release quantities and projections, which would require manual calculation of these values. This system is required for meeting regulatory requirements; it is being replaced with a system that is Y2K compliant.	Operations	9/30/99
	Emergency Response Data System (ERDS). This system automatically transmits selected plant data to the NRC in the event of a plant accident or emergency. ERDS performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, it could result in the loss of automated data transmission to regulatory agencies. Data would be communicated through other means such as telephone and facsimile. Automatic control of plant systems would not be affected. A vendor is in the process of remediating the system.	Operations	9/15/99
Beaver Valley Power Station, Unit 1	Plant Monitoring and Trending Computer (IPC). This system monitors and trends Unit 1 processes. The IPC performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, it would not affect the safety status or generation capability of the plant but could require operators to revert to primary indicators and data sources. A vendor is in the	Operations	9/30/99

	process of remediating the system.		
Beaver Valley Power Station, Unit 2	Emergency Response Facility Monitoring and Trending Computer (ERFCS). This system monitors and trends data and sends them to the emergency response facility in the event of an alert declaration; it functions as a safety parameter display system (SPDS) for Unit 2. The ERFCS performs no plant control or actuation functions. If this system is left uncorrected and it fails because of a Y2K-related failure, it would not affect safety status or generation capability of the plant but could result in the loss of historical trending during accidents, loss of displays in the emergency response facility, and loss of data to the ERDS; automatic control of plant functions would not be affected.	Operations	9/30/99
Browns Ferry Nuclear Power Station, Units 2 and 3	Health Physics Information Management System. This administrative computer system tracks and reports radiation exposure and access control to radiation areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process. The replacement program is complete and training is in progress to facilitate implementation.	Admin.	10/31/99
	Security Check-In Process Software. This administrative computer system logs and confirms access to plant areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process; the replacement program is being tested. Minimal training and rollout will be required because this program has limited distribution and use.	Admin.	10/31/99

Browns Ferry Nuclear Power Station, Units 2 and 3 (cont.)	Nuclear Operations Management System. This administrative system logs and reports reactor operations information. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would resort to manual logs as specified by current procedures. Programming and testing are complete, and implementation is scheduled for September 1999. Procedural revisions required for implementation that include process improvements currently restrict closure.	Admin.	10/31/99
Clinton Power Station, Unit 1	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually. Y2K readiness of this application was delayed by plant restart. General Electric Nuclear Energy (GENE) required 100% power data from the current Clinton Power Station fuel configuration to complete the site-specific design package (including Baseline 96 software). The Baseline 96 software package has been verified to be Y2K ready and has been successfully installed at other nuclear facilities.	Operations	9/22/99
Comanche Peak Steam Electric Station, Unit 1	Unit 1 Condensate Polishing Programmable Logic Controller System. This non-safety related computer system controls feedwater treatment processes for water being drawn off the condenser. If this system is left uncorrected and it fails because of a Y2K-related failure, this system may be bypassed. The Unit 1 modification is similar to the successful modification at Unit 2. Modification of this system requires a plant outage.	Operations	11/30/99

Comanche Peak Steam Electric Station, Units 1 and 2	Common Facility - Plant Simulator. The plant training simulator provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding onsite training facility capabilities, and plant operator training schedules could be affected.	Admin.	10/30/99
Cooper Nuclear Station	Integrated Contingency Planning. The integrated contingency plan (ICP) provides facility management with a comprehensive perspective of the risks associated with Y2K-induced events, and includes any remedial actions planned during key rollover dates. The licensee has developed contingency plans for individual systems and components. The licensee is in the process of integrating these individual contingency plans into the ICP.	Operations	9/20/99
Diablo Canyon Nuclear Power Plant, Units 1 and 2	Main Annunciator System (MAS). This non-safety related system provides primary and intermediate notifications of plant equipment status and plant operating status information in the main control room. The MAS is referenced in the plant emergency operating procedures as part of the instructions for confirming plant component status. The MAS could affect operability of radiation monitor alarms. If this system is left uncorrected, the licensee would continue to use the existing annunciator system with the clocks turned back to prevent system clock rollover into 2000. The upgraded MAS is scheduled to be installed no later than the end of the upcoming Unit 2 refueling outage.	Operations	10/31/99

Donald C. Cook Nuclear Plant, Units 1 and 2	Meteorological Information and Dispersion Assessment System (MIDAS). This administrative computer system tracks meteorological conditions and calculates radioactivity release dispersion patterns based on existing meteorological data. If this system is left uncorrected and it fails because of a Y2K-related failure, entry into a technical specification action statement would be required. Meteorological information can be manually obtained from the meteorological towers and transmitted to the control room for manual calculations. A design upgrade is in progress to install new computer hardware and software that is Y2K ready.	Admin.	10/30/99
Hope Creek Nuclear Station, Unit 1	Plant Training Simulator. This system provides operator training in a simulated control room environment identical to the plant control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding on site training facility capabilities, and plant operator training schedules could be affected. The licensee is upgrading the plant simulator with the same software being used to upgrade the SPDS.	Admin.	10/29/99
	Emergency Response Data System (ERDS). This PC-based system sends emergency response data information to the NRC and local authorities. If this system is left uncorrected and it fails because of a Y2K-related failure, the licensee would report information using existing plant emergency operating procedures. The licensee is waiting for a replacement engineer workstation to be delivered.	Admin.	9/30/99

Joseph M. Farley Nuclear Plant, Unit 2	Unit 2 Turbine Digital Electrohydraulic Controller. This system controls steam flow to the plant main turbine, and provides turbine overspeed protection. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. This system was successfully installed on Unit 1 and was tested for Y2K dates. Remediation of this system is scheduled for a plant refueling outage from October 16 to December 16, 1999.	Operations	12/16/99
Limerick Generating Station, Unit 2	Plant Monitoring System and 3D Monicore. This system is needed for startup and continued long-term plant operations. The 3D Monicore system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually.	Operations	9/30/99
North Anna Power Station, Unit 2	High Capacity Steam Generator (SG) Blowdown Radiation Monitor. This component monitors radiation levels in the SG blowdown effluent. This monitor does not perform a safety function but is included in the design for added protection against the potential for release of radioactivity to the environment. If this monitor is left uncorrected and it fails because of a Y2K-related failure, the plant operators will use alternate radiation monitors to detect radioactivity on the shell side of the steam generators. The firmware in the local processing and local display units will be upgraded to a Y2K compliant version.	Admin.	10/29/99

North Anna Power Station, Unit 2 (cont)	High Capacity Steam Generator Blowdown Distributed Control System (SGBCS). This non-safety related system controls ionic impurity concentrations on the shell side of the steam generators. It is not required for continued operation of the facility. If this system is left uncorrected and it fails because of a Y2K-related failure, it would be bypassed and ionic concentrations would be determined manually. Required materials and software are on-hand and design change development is nearing completion. The original system vendor is supporting factory and on-site installation and acceptance testing.	Admin.	10/29/99
Oyster Creek Nuclear Generating Station	REM/AACS/CISCO. This integrated software system manages personnel radiation exposure and controls access to radiologically controlled areas. If this system is left uncorrected and it fails because of a Y2K-related failure, control of radiation exposure and access would be tracked manually.	Admin.	9/30/99
Peach Bottom Atomic Power Station, Unit 2	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually.	Operations	9/30/99
Peach Bottom Atomic Power Station, Unit 3	Digital Feedwater System. This non-safety-related system controls feedwater flow rate into the reactor vessel, and is required for plant operation. The digital feedwater system to be installed in Unit 3 is identical to the Peach Bottom Unit 2 system, which has been installed, tested, and is operational. The hardware and software have been developed, and are on-site, ready for installation. A planned outage for installing this system is currently scheduled.	Operations	10/31/99

Peach Bottom Atomic Power Station, Unit 3 (cont)	Turbine Vibration Monitor. This system monitors reactor feedwater pump turbine and the main turbine system operation and trips these turbines when excessive vibration is detected. If this system is left uncorrected and it fails because of a Y2K-related failure, it will not result in a spurious pump turbine trip or a main turbine trip. These two trips are for equipment protection only. An identical computer system has been performed on Peach Bottom Unit 2. The Unit 3 work will be performed during the next outage.	Operations	10/31/99
	3D Monicore. This system monitors reactor operation processes and calculates reactor thermal power operating limits. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant operators would calculate thermal operating limits manually.	Operations	9/30/99
Salem Nuclear Generating Station, Unit 1	Advanced Digital Feedwater System. This non-safety-related system controls feedwater flow rate into the steam generators, and is required for plant operation. The system is identical to the Salem Unit 2 system, which has been installed, tested, and is operational. The only part of this system affected by Y2K-related issues is an engineering workstation, which provides the human interface to the feedwater system. If this system is left uncorrected and the workstation fails because of a Y2K-related failure, the operators could adjust feedwater flow rate manually using existing control room instrumentation and controls. This upgrade has been performed on Salem Unit 2 and is scheduled for installation during the Unit 1 refueling outage.	Operations	11/6/99

Salem Nuclear Generating Station, Unit 1(cont)	Overhead Annunciators. These components provide primary and intermediate notifications of plant equipment status and plant operating status information in the main control room. The overhead annunciators are referenced in the plant emergency operating procedures as part of the instructions for confirming plant component status. If the annunciators are left uncorrected and it fails because of a Y2K-related failure, plant equipment status would be monitored manually. Replacement of this system is outage-dependent. This upgrade has been performed on Salem Unit 2 and a similar upgrade is scheduled for the Unit 1 refueling outage.	Operations	11/6/99
	Plant Computer Monitoring and Alarm System. This system monitors and displays plant data for reactor operations. If this system is left uncorrected and it fails because of a Y2K-related failure, the operators would obtain needed plant information from the normal plant indications. This system is needed for operations when the reactor core coolant level is lowered to support mid-loop operations (a special refueling outage maintenance procedure for steam generator maintenance). There are no regulatory requirements for this system while the plant is at full power. This upgrade must be performed while the plant is in an outage. This upgrade has been performed on Salem Unit 2 and a similar upgrade is scheduled for the Unit 1 refueling outage.	Operations	11/6/99
Salem Nuclear Generating Station, Units 1 and 2	Plant Training Simulator. The plant training simulator provides operator training in a simulated control room environment identical to the plant control room.. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would not meet its regulatory commitment regarding on site training facility capabilities, and plant operator training schedules could be affected. The licensee is upgrading the plant simulator	Admin.	10/29/99

	with the same software being used to upgrade the SPDS.		
Salem Nuclear Generating Station, Units 1 and 2 (cont)	Emergency Response Data System (ERDS). This PC-based system sends emergency response data information to the NRC and local authorities. If this system is left uncorrected and it fails because of a Y2K-related failure, the licensee would report information using existing plant emergency operating procedures. The licensee is waiting for a replacement engineer workstation to be delivered.	Admin.	9/30/99
Sequoyah Nuclear Plant, Units 1 and 2	Health Physics Information Management System. This administrative system tracks and reports radiation exposure and access control to radiation areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process. The replacement program is complete and training in progress to facilitate implementation.	Admin.	10/31/99
	Security Check-In Process Software. This administrative computer system logs and confirms access to plant areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process; the replacement program is in BETA testing. Minimal training and rollout will be required because this program has limited distribution and use.	Admin.	10/31/99
	Nuclear Operations Management System. This administrative computer system logs and reports rector operations information. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would resort to manual logs as specified by current procedures. Programming and testing are complete, and implementation is scheduled for September 1999. Procedural revisions required for implementation that include process improvements currently restrict closure.	Admin.	10/31/99

South Texas Project Electric Generating Station, Units 1 and 2	Plant Integrated Computer System (ICS). This system collects plant operating information and displays plant status in the main control room. If this system is left uncorrected and it fails because of a Y2K-related failure, the operators would use existing plant instrumentation information as required by plant procedures and training. This system has been installed and tested for Y2K readiness, but the final change from all legacy systems to the new ICS has not yet occurred. This project has been ongoing for several years to address obsolescence, and was not implemented as a result of the licensee's Y2K project.	Operations	10/31/99
Three Mile Island Nuclear Station, Unit 1	Digital Turbine Control System. This system controls steam flow to the plant main turbine. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant could not control turbine speed, which could affect electrical power generation. Contingency plans have been developed to mitigate the impact of Y2K-related events at key rollover dates. A replica simulation of the digital turbine control system was configured and tested in the designer/supplier's shop to demonstrate the system is Y2K ready.	Operations	10/21/99
	REM/AACS/CISCO. This system manages personnel radiation exposures and controls access to radiologically controlled areas. If this system is left uncorrected and it fails because of a Y2K-related failure, control of radiation exposure and access would be tracked manually.	Admin.	9/30/99
Vermont Yankee Nuclear Power Station	Refueling Platform - This system controls the refueling platform during fuel movements. If this system is left uncorrected and it fails because of a Y2K-related failure, the electronic logic required for control of the safety-related platform would be rendered inoperable, preventing fuel movement. However, the refueling platform is not expected to be moved occur during the key rollover dates. If the platform is	Admin.	9/30/99

	needed immediately following the 1999 refueling outage (after December 31, 1999) and hasn't been remediated, the computer date could be manually reset to an earlier 1999 date.		
Watts Bar Nuclear Plant, Unit 1	Health Physics Information Management System. This administrative system tracks and reports radiation exposure and access control to radiation areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process. The replacement program is complete and training is in progress to facilitate implementation.	Admin.	10/31/99
	Nuclear Operations Management System. This administrative system logs and reports reactor operations information. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would resort to manual logs as specified by current procedures. Programming and testing are complete, and implementation is scheduled for September 1999. Procedural revisions required for implementation that include process improvements currently restrict closure.	Admin.	10/31/99
	Security Check-In Process Software. This administrative system logs and confirms access to plant areas. If this system is left uncorrected and it fails because of a Y2K-related failure, the plant would default to a manual process; the replacement program is in BETA testing. Minimal training and rollout will be required because this program has limited distribution and use.	Admin.	10/31/99

United States Nuclear Regulatory Commission Status Report on Year 2000 Activities for April 1999

INTRODUCTION

In September and October 1998 and in January 1999, the staff provided the Commission with status reports on Year 2000 (Y2K) activities. These previous reports focused principally on agency Y2K activities for nuclear power plants. This report focuses more broadly on all agency Y2K activities. Attached to this report is a timeline of major NRC Y2K milestones and the Nuclear Utility Year 2000 Readiness March 1999 Survey Summary. The Nuclear Energy Institute provided this summary to the NRC on April 8, 1999. These reports, along with other detailed Y2K-related information on NRC Y2K activities, are available on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

The NRC supports the efforts of the President's Council on Year 2000 Conversion and is a active member of the Council's Year 2000 Energy/Electric sector, Health Care sector, and Emergency Services sector working groups. NRC continues to work with representatives from the Federal Energy Regulatory Commission and the Department of Energy to share information regarding potential problems associated with the Year 2000. Additional information concerning the activities of the President's Council can be found on the Council's website at http://www.y2k.gov.

On February 11, 1999, the Commission met with John Koskinen, Chair of the President's Council on Year 2000 Conversion, members of the NRC staff, and representatives from the Nuclear Energy Institute and the Nuclear Information and Resource Service (NIRS) to discuss Y2K issues. On February 24, 1999, Dr. William Travers, Executive Director for Operations, testified before the NRC's Senate oversight committee on NRC's Y2K activities.

NRC YEAR 2000 ACTIVITIES

Over the past several years the U.S. Nuclear Regulatory Commission (NRC) staff has been working with our licensees to prepare for the Y2K transition. The NRC continues to maintain an appropriate regulatory framework for overseeing Y2K readiness efforts at all NRC-licensed facilities.

Since 1996, the NRC has been working with nuclear industry organizations and licensees to address the Y2K problem. To ensure that senior-level management at operating NRC-licensed facilities was aware of the Y2K issue, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. IN 96-70 describes the potential problems that nuclear facility computer systems and software might encounter during the transition to the new millennium. All U.S. nuclear power plants, fuel cycle facilities, and other material licensees were provided with copies of this document.

POWER REACTORS

In 1997, the Nuclear Energy Institute (NEI) agreed to take the lead in developing industry-wide guidance

for addressing the Y2K issue at nuclear power reactors. In November 1997, NEI issued a guidance document to all U.S. nuclear power plant licensees, titled "Nuclear Utility Year 2000 Readiness" (NEI/NUSMG 97-07).

In Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," May 11, 1998; the NRC accepted the NEI/NUSMG 97-07 guidance as an appropriate program for nuclear power plant readiness and required that all operating U.S. nuclear power plant licensees submit written responses regarding their facility-specific Y2K readiness programs in order to obtain confirmation that licensees are addressing the Y2K issue effectively. All licensees have responded to GL 98-01 stating that they have adopted plant-specific programs that are intended to make the plants Y2K ready by July 1, 1999. GL 98-01 also requires a written response, no later than July 1, 1999, confirming that these facilities are Y2K ready. Licensees who are not Y2K ready by July 1, 1999, must provide a status report and schedule for remaining work to ensure timely Y2K readiness.

One of a number of initiatives undertaken by the NRC staff to address the Y2K problem was the conduct of 12 sample audits of licensee Y2K readiness programs. A sample audit approach was determined by the NRC staff to be an appropriate means of oversight of licensee Y2K readiness efforts based on the fact that 1) all licensees had committed to the nuclear power industry Y2K readiness guidance (NEI/NUSMG 97-07) in their first response to GL 98-01 and 2) the NRC staff had not identified any Y2K problems in safety-related actuation systems. The 12-licensee sample included large utilities such as Commonwealth Edison and Tennessee Valley Authority (TVA) as well as small single unit licensees such as North Atlantic Energy (Seabrook) and Wolf Creek Nuclear Operating Corporation. Because licensee Y2K programs are corporate-wide, many of the NRC staff audits included more than a single nuclear power plant site since many utilities own more than one nuclear power plant. In all, a total of 42 of 103 operating nuclear power plant units were associated with the Y2K readiness program audits of 12 utilities. The NRC staff selected a variety of types of plants of different ages and locations in this sample in order to obtain the necessary assurance that nuclear power industry Y2K readiness programs are being effectively implemented and that licensees are on schedule to meet the readiness target date of July 1, 1999, established in GL 98-01.

In late January 1999, we completed the 12 audits. Based on the results of these audits, we concluded that the audited licensees were effectively addressing Y2K issues and were undertaking the actions necessary to achieve Y2K readiness per the GL 98-01 target date. We did not identify any issues that would preclude these licensees from achieving readiness. These findings are consistent with those recently reported by the Department of Energy in the report prepared by the North American Electric Reliability Council on the status of Y2K readiness of the electric power grid.

The majority of commercial nuclear power plants have protection systems that are analog rather than digital. Since Y2K concerns are associated with digital systems, analog reactor protection system functions are not impacted by Y2K issues. Digital systems are being addressed as part of the licensee Y2K readiness programs. Errors such as incorrect dates in print-outs, logs or displays have been identified by licensees in safety-related devices, but the errors do not affect the functions performed by the devices or systems. Most Y2K issues are in balance-of-plant and other systems such as security and plant monitoring systems which support day-to-day plant operation but have no direct functions necessary for safe operation of the reactor. These systems are being addressed in the licensee Y2K readiness programs consistent with the industry guidance and GL 98-01 schedule. To date, the NRC staff has not identified any Y2K problems in nuclear power plant systems that directly impact actuation of

safety functions.

We have noted from the completed audits that licensee Y2K contingency planning efforts have not progressed far enough for a complete NRC staff review, and, therefore, additional oversight of this area is planned for the Spring of 1999. The NRC staff currently plans to review the contingency planning efforts of six different licensees from those included in the initial 12 sample Y2K readiness audits, beginning in May 1999 and ending in June 1999. Licensee Y2K programs are corporate-wide and many utilities own more than one nuclear power plant. Therefore, a total of 18 operating nuclear power plant units will be associated with these six licensee reviews. These reviews will focus on the licensee's approach to addressing both internal and external Y2K risks to safe plant operations based on the guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." Headquarters staff will perform the 2-3 day audit with assistance from the applicable region and/or resident inspector. The following sites were selected and the corresponding licensees were informed of these future audits:

Oconee	Indian Point 2
Palo Verde	Turkey Point
Duane Arnold	Diablo Canyon

In addition to the NRC staff activities addressed above, NRC inspectors will review plant-specific Y2K program implementation activities at all nuclear power plant facilities. The inspectors will be using guidance prepared by the NRC headquarters staff who conducted the 12 sample audits. The results of these plant- specific Y2K program reviews will be documented in publically available documents which will be posted on the NRC Year 2000 website. In April 1999, the staff plans to issue an information notice (IN) regarding the results of the 12-plant sample audit.

The NRC staff will continue its oversight of the Y2K issue in nuclear power plants through the remainder of 1999. In July 1999, we will review all licensee responses to GL 98-01 and address any responses that raise concerns. By September 1999, we will determine the need for issuing orders to address Y2K readiness issues, including, if warranted, shutdown of a plant. At this time, we believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and do not believe that significant plant-specific action directed by the NRC is likely to be needed.

Nevertheless, the nuclear utility industry and the NRC are developing comprehensive contingency plans to cope with any unanticipated problems should they arise during the Year 2000 transition. This approach is consistent with the defense-in- depth philosophy applied to assuring nuclear safety.

Since the last periodic report on Y2K activities the Office of Nuclear Reactor Regulation has re-organized and the responsibility for reactor-related Y2K activities has been transferred to the Division of Engineering. Richard Wessman, Deputy Director of the Division of Engineering, is the lead management point of contact for reactor-related Y2K activities. Jared Wermiel has assumed a new position as Chief, Reactor Systems Branch.

At the NRC Regulatory Information Conference which was held from March 3 through March 5, 1999, in Washington D.C., the staff discussed Y2K related issues with NEI and nuclear power plant owners.

The staff has developed a Temporary Instruction (TI) and review checklist and completed training of inspectors to support review of Y2K activities at all power reactors. The TI has been placed on the NRC

web site. All day training sessions on the TI and the site reviews were conducted on March 25 and March 31, 1999. Regional Offices were connected via video conference and the appropriate resident or regional inspectors attended the subject sessions. A video tape based upon the training sessions will be made available for other regional personnel.

The comment period for the three Nuclear Information and Resource Service (NIRS) rulemaking petitions ended on March 28, 1999 and the staff is preparing its response. The staff has initiated a dialogue with NIRS and invited NIRS to participate in a public meeting with NEI. The staff will continue to engage NIRS in future public meetings and workshops.

The staff has been invited and plans to participate in the EPRI Y2K Embedded Systems Workshop to be held from April 26 through 30, 1999. The staff has also been invited and plans to participate in the Nuclear Utility Software Management Group (NUSMG) Conference on Y2K Issues, to be held on April 28 and 29, 1999.

The industry is actively engaged in addressing the Y2K problem. The North American Electric Reliability Council (NERC) established recommended industry-wide milestones for ensuring that U.S. electric systems are ready for the Year 2000. The recommended completion date for the remediation/testing phase of Y2K preparations is May 1999. Mission-critical systems and components (e.g., power production, energy management systems, telecommunications, substation controls and system protection, and distribution systems) are to be made Y2K ready by June 30, 1999. NEI has collected data from the industry regarding Y2K progress provided the NRC with a summary report on April 8, 1999. This summary report is attached. NEI has encouraged licensees to make a public announcement when their internal review has been completed and they have concluded that their plants are Y2K ready.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

In order to gather Y2K information regarding fuel cycle facilities and materials licensees, the Office of Nuclear Material Safety and Safeguards (NMSS) formed a Y2K Team. From September 1997 through December 1997, the NMSS Y2K Team visited a cross-section of materials licensees and fuel cycle facilities and conducted Y2K interviews. Each licensee or facility visited by the team indicated that they were aware of the Y2K issue and were in various stages of implementing their Year 2000 readiness programs. Also, telephone interviews were conducted with device manufacturers and distributors. From the interviews and site visits, NRC was assured by licensees that health and safety at materials facilities and fuel facilities would not be compromised due to Y2K problems. Further, NRC determined that few materials licensees use processes that are computer-controlled. From the interviews, NRC learned that early versions of some treatment planning systems (computer systems for calculating dose to medical patients being treated with radiation or radioactive material) have Y2K problems and that upgrades for treatment planning systems were available. However, treatment planning systems are not regulated by the NRC, because they do not contain licensed material. NRC has shared information on non-Y2K compliant treatment planning systems with the Food and Drug Administration (FDA). For materials licensees, no Y2K issues for NRC regulated material were identified. For fuel cycle facilities, one database was identified that had a Y2K problem, and the facility indicated that they would convert it to a Y2K compliant database as part of their Y2K Readiness Program. As a result of the interviews and site

visits, NRC's focus has been to determine if any commercially-available devices (medical and industrial) are Y2K vulnerable, and to assure that licensees evaluate self-developed systems, commercial off the shelf software and hardware, and safety systems.

Since November 17, 1997, materials and fuel cycle inspectors have been instructed to confirm receipt of NRC's Y2K Information Notices by materials and fuel cycle licensees and certificate holders; determine whether the licensees and certificate holders have identified any potential problems associated with the Y2K issue; and note any corrective actions taken by the licensees and certificate holders. Generic Year 2000 information, received from inspectors, will be passed on to NRC licensees. To date, only treatment planning systems, dose calibrators, and a tote position display for an irradiator have been found to have Y2K problems. As stated above, NRC has informed the FDA of all treatment planning systems and dose calibrators that materials licensees have found to have Y2K problems. Upgrades for these treatment planning systems and dose calibrators are available from manufacturers. Materials inspectors have indicated that licensees are aware of these upgrades and that the licensees will complete the upgrades before the end of 1999. The irradiator tote position display is not a safety system. Further, the irradiator tote position display system that had the Y2K problem was made susceptible by a one-of-a-kind modification made by the licensee. The licensee was authorized by NRC to make the modifications and is updating the display system. To date, no generic Y2K issues for NRC regulated material used by materials licensees have been identified.

In addition to Y2K inquiries during routine inspections, NRC is monitoring several list servers, manufacturer websites, ne media, Congressional reports, and Presidents' Y2K Council reports for Y2K issues that may affect materials licensees. If Y2K issues that will affect materials licensees are discovered, the information will be sent to licensees through generic communications and placed on the NRC Y2K webpage.

To alert licensees and certificate holders to the Y2K problem, NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996, IN 97-61, "U.S. Department of Health and Human Services Letter, to Medical Device Manufacturers, on the Year 2000 Problem," on August 6, 1997, and IN 98-30, "Effect of the Year 2000 Computer Problem on NRC Licensees and Certificate Holders," on August 12, 1998. In IN 96-70, the staff described the potential problems that computer systems and software may encounter as a result of the change from the year 1999 to the year 2000 and how the Y2K issue may affect NRC licensees and certificate holders. IN 96-70 encouraged licensees and certificate holders to examine their uses of computer systems and software well before the year 2000 and suggested that they consider appropriate actions to examine and evaluate their computer systems for Y2K vulnerabilities. In IN 97-61, the NRC staff forwarded to licensees a letter from the U.S. Department of Health and Human Services, Food and Drug Administration, to medical device manufacturers, regarding the Y2K problem. In a letter dated June 25, 1997, the FDA reminded medical device manufacturers that some computer systems and software applications currently used in medical devices, including embedded microprocessors, may experience problems as a result of the turn to the new century. In addition, the letter indicated that computer-controlled design, production, or quality control processes could be adversely affected. In IN 98-30, the staff alerted licensees and certificate holders to systems that were known to be or may be affected by Y2K problems, encouraged licensees and certificate holders to contact vendors and test their systems for Y2K problems, and provided elements of a sample Y2K readiness program. All Y2K related Information Notices and Generic Letters that were sent to licensees have been placed on the NRC's external Web site.

In an effort to provide our medical licensees with Y2K information, NRC has been working with the FDA. NRC and FDA will continue to share Y2K information.

In order to obtain confirmation that fuel cycle licensees and certificate holders are effectively addressing the Y2K issue, NRC issued GL 98-03, "NMSS Licensees' and Certificate Holders' Year 2000 Readiness Programs," in June 1998. Similar to GL 98-01 for nuclear power plants, GL 98-03 required that fuel cycle facilities submit written responses regarding their facility- specific Y2K readiness program. In the first of three required responses to GL 98-03, all ten fuel cycle facilities (nine fuel cycle licensees and certificate holders) responded that they have adopted facility-specific Y2K readiness programs. In the second of three required responses to GL 98-03, all ten fuel cycle facilities responded. One facility will be Y2K ready by April 1999, six facilities will be Y2K ready by July 1999, two facilities will be Y2K ready by October 1999, and one facility reported that they will be Y2K compliant by December 1999. However, in subsequent communications, the licensee for the facility reporting Y2K compliance by December 1999 informed the NRC that although they will not be Y2K compliant until December 1999, they are currently Y2K ready. The third of three required responses to GL 98-03 is due by July 1, 1999, and requires confirmation that the facility is Y2K ready. Fuel cycle facilities which are not Y2K ready by July 1, 1999, must provide a status report and schedule for remaining work to become Y2K ready.

Between September 1997 and October 1998, the ten major fuel cycle facilities were, in conjunction with other inspection activities, inspected for Y2K concerns. Based on these Y2K inspections, the facilities were aware of the Y2K problem and were adequately addressing Y2K issues.

In support of the President's Council on Year 2000 Conversion, NRC has participated in and provided information to the Health Care Sector and the Environmental Protection Sector. Further, NRC participated in the Y2K medical event (exercise) at George Washington University Hospital.

Recently, NMSS participated in Y2K Health Care Sector meetings, led by Health Care Financing Administration (HCFA), to plan Y2K Action week, March 29 though April 2. HCFA sponsored Y2K events in 12 cities. HCFA, FDA, Veterans Administration, and Department of Defense and guests from local utilities, telecommunications, banking, transportation, emergency services, State Medicaid agencies, and other Health and Human Services agencies participated in the events. Professional associations notified members of the Y2K events. NRC attended planning meetings, but did not participate in the events because the materials licensee community is relatively small, with a narrow scope of health care operations, and the Y2K events were aimed at a broader health care and public audience.

NMSS is currently updating the materials and fuel cycle Y2K webpage. The front page will include more information regarding NRC Y2K activities. Additionally, useful links to other Y2K websites will be added.

AGREEMENT STATES

In February 1998, NRC provided information to Agreement States to increase their awareness of the Y2K problem. (Ref. All Agreement States Letter SP-98-008). Through the letter, States were provided information on the nature and scope of the Y2K problem, potential problems for materials licensees, and the actions NRC was taking to encourage NRC materials licensees to examine their computer systems

and software. In the letter, we recommended that Agreement States also encourage their licensees to conduct similar examinations to assure they are Y2K compliant. NRC also requested Agreement States to share information with NRC on any Y2K problems identified by Agreement State licensees that could impact NRC, other Agreement States, or other licensees.

To help provide further information to Agreement States, a link was established on the Office of State Programs (OSP) home page directly to the NRC Y2K website to help States obtain access to NRC information. We also provided the Agreement States with information on how to subscribe to the NRC year 2000 list server that would automatically E-MAIL information to subscribers as it became available.

On January 26, 1999, all Agreement States were contacted again through the OSP list server referring them to the earlier February 6, 1998 letter, and asking that they be sure to share with us any information on Y2K problems that may have been identified by their licensees. We also asked for information on the status of their efforts to address Y2K issues.

State responses, although limited in number, indicated that Y2K was being addressed through State wide efforts and anticipated completion before the year 2000. No licensee problems were identified.

In addition, during Management Review Board (MRB) meetings for the Integrated Material Performance Evaluation Program over the past 18 months, the MRB Chair has questioned Agreement State managers about their State's Y2K activities. The managers have indicated that Y2K issues in their programs were being addressed as part of statewide efforts.

CONTINGENCY PLANNING

The NRC Y2K Contingency Planning Task Force is an interoffice, multi-disciplinary team constituted to provide recommendations and guidance to help ensure that the agency can appropriately respond to unanticipated Y2K problems at our licensed facilities. To support this goal, the Task Force has developed a draft Contingency Plan that will be used to deal with unforseen Y2K problems that may affect NRC licensed facilities. This draft plan was placed on the NRC's external Y2K web site (http://www.nrc.gov/NRC/NEWS/year2000.html) to facilitate external stakeholder coordination and to solicit input. The staff is also developing a one-time "Interim Policy Statement on Enforcement Discretion for Y2K" that will be forwarded to the Commission for review.

After external stakeholder input has been incorporated into the contingency plan, it will be submitted to the Commission for formal approval. The NRC is also actively participating in several Inter-Agency working groups that are planning for Y2K contingencies. These groups include the Catastrophic Disaster Response Group and the President's Council Y2K Emergency Services Sector working group. The NRC plans to conduct exercises in preparation for potential Y2K problems.

The Task Force continued to develop and refine the NRC Y2K contingency plan based on stakeholder feedback and the February 19, 1999 Staff Requirements Memorandum (SRM). Comments on the draft contingency plan were received from several Federal Agencies, from NEI and several utilities, from public citizen groups (e.g., NIRS, Massachusetts Citizens for Safe Energy, Global Resource Action Center for the Environment) and from private citizens. Major milestones are summarized below.

Exercises

The task force is presently considering two different exercises. The first exercise would be a Table Top exercise sometime this summer that would involve NRC (Headquarters and the Regions), a utility, a State, and a county. The purpose of this exercise would be to talk through how contingency plans for each organization would be used in response to a number of scenarios (e.g., loss of telecommunications, loss of power). Both BG&E; and the State of Maryland are interested in participating in this exercise. The second exercise would be a larger scale exercise. During this exercise, the NRC would test the Y2K contingency plan in its entirety, including the information sharing and regulatory response aspects of the contingency plan. To date, about a half-dozen utilities have expressed an interest in participating in this exercise.

Coordination and Communication

The staff is working closely with FEMA and the President's Council on the Y2K issue. The staff supported regional FEMA workshops by providing input on the NRC Y2K program as part of the workshop package. The purpose of workshops is to communicate to regional Federal agencies, States, and local government officials, the status of Y2K issues associated with the major sectors of the infrastructure (transportation, energy, food supplies, health care, etc.) and to assist them in contingency planning efforts. The staff is also working closely with FEMA on their plans to conduct Y2K workshops for the State and local radiological emergency preparedness (REP) community. These workshops will also include participation by NRC and our nuclear power plant licensees.

The staff has also worked closely with the National Communication System (NCS) regarding the National Telecommunications Coordination Network (NTCN) that is being developed to provide for emergency communications in the event of a widespread telecommunications outage. In addition, the staff has consulted Booz Allen to provide recommendations for portable satellite equipment to support the Y2K contingency plan and to augment the NRC Emergency Telecommunications System. One of the requirements of this equipment is compatibility with the NTCN. At the request of NRC, the NCS has contacted telecommunications companies that provide service to NRC nuclear power plant licensees regarding Y2K readiness.

NRC and IAEA are coordinating contingency plans for direct NRC-IAEA communications in case of a U.S. nuclear emergency. In February 1999 OIP met with the IAEA's emergency response team and discussed coordination of Y2K contingency plans. Further discussions will be held in May 1999 during the visit of an IAEA emergency response team member to the NRC

INTERNATIONAL PROGRAMS

The Office of International Programs (OIP) participates in international multilateral information exchange and coordination fora such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA).

International Atomic Energy Agency (IAEA)

In preparation for the 42nd IAEA General Conference in September 1998, the NRC took the lead in drafting a resolution on Y2K readiness for the safety of nuclear power plants, fuel cycle facilities, and other enterprises using radioactive materials. That resolution urged, among other things, that Member

States submit information to the IAEA on activities underway to inventory and remediate Y2K problems at their nuclear facilities, and that the IAEA act as a central coordination point in disseminating information about member state Y2K activities.

During numerous bilateral meetings with countries such as Argentina, Lithuania, Russia, and the Ukraine, the NRC presented the draft resolution and urged their support. Ultimately, 28 member states co-sponsored the resolution, including a number of countries that have nuclear facilities whose safety are of particular concern to the U.S. Government.

In response, the IAEA has created a special project to address nuclear Y2K-related safety concerns and contingency planning for nuclear power plants and research reactors, and is in the process of holding several Y2K workshops. The IAEA also conducted a survey of its Member State's Y2K programs in which the NRC participated (see http://www.iaea.org/ns/nusafe/y2000 /y2kinfor.htm).

Since the General Conference, the NRC has worked with the IAEA to formulate a Y2K program that would address nuclear safety aspects of Y2K issues, particularly those at Soviet-designed reactors in the New Independent States (NIS) and Central and Eastern Europe (CEE).

The U.S. also provided a cost-free expert to the IAEA to assist in the establishment of IAEA Y2K guidelines and Y2K contingency planning.

The IAEA Department of Safeguards established a project in 1996 for Y2K conversion activities. The project covers assessment, conversion and testing of the software applications, instrument evaluation software, embedded systems, PC hardware attached to various equipment and computer infrastructure. In addition, the IAEA is working closely with Member States and the State's systems of accounting for control of nuclear material and on the conversion of systems used jointly with Member States at nuclear facilities.

In February 1999 OIP participated in an international seminar on Y2K and safeguards and physical protection sponsored by the IAEA. The seminar was attended by 47 IAEA Member States and OIP presented a progress report on the NRC's Y2K efforts. A working group was established and issued recommendations to regulatory authorities and facility operators on how to remediate Y2K problems in the area of physical protection.

Nuclear Energy Agency (NEA)

In February 1998, the NEA sent a Y2K questionnaire to members of its Committee on Nuclear Regulatory Agencies (CNRA). The responses showed that participating regulatory bodies were taking aggressive steps with licensees to identify and solve Y2K issues. In August 1998, the NEA finished its work on an international e- mail notification system, enabling CNRA members to rapidly and confidentially exchange Y2K information. The CNRA members are Belgium, Canada, Czech Republic, Finland, France, Germany, Hungary, IAEA, Japan, Netherlands, South Korea, Spain, Sweden, Switzerland, United Kingdom, and United States.

The NEA also organized a International Workshop on the Impact of the Year 2000 on the Nuclear Industry which was held in Ottawa, Canada in February 1999 (co-sponsored by the IAEA). This workshop was also attended by regulators from the former Soviet Union and Central and Eastern Europe. On February 9, 1999, NRC Chairman Jackson provided a keynote address and invited countries to participate in a Y2K contingency plan exercise later this year.

NRC and NEA are in the process of creating a Y2K Early Warning System (YEWS). Countries in earlier time zones, which will experience any Y2K-related problems before the U.S. does, have been invited to relate information about Y2K issues to YEWS in the quickest possible manner to enable licensees in participating countries avoid common-cause failures. This effort includes mainly Far Eastern countries, such as Japan, South Korea, and Taiwan, which operate U.S.-style reactors, as well as certain European countries and Canada and Mexico. The time difference for these countries vs. EST or PST ranges from plus 12 to 15 hours (Far East) to 6 to 9 hours (Europe). To the extent feasible YEWS will also be coordinated with the Departments of State and Energy.

NRC's main focus of bilateral contingency planning efforts is on Canada and Mexico. The NRC enjoys close bilateral ties with both countries and special emergency procedures are already in place permitting rapid and redundant communications should an emergency arise. Contingency planning for these countries involves, among other things, the examination of existing procedures and communications channels for Y2K compliance. In addition, Canada and Mexico will participate in YEWS.

The Atomic Energy Control Board (AECB) of Canada is addressing the Y2K issue at Canadian nuclear power plants and hopes to have all plants Y2K compliant by June 30, 1999. Members of the NRC's contingency planning team met with the AECB in December 1998 and again in February 1999 to discuss coordination of their respective Y2K contingency plans.

On April 5, representatives from the OIP discussed Y2K issues, among other topics, with the Mexican regulators in Mexico City. OIP has issued a formal invitation to the Mexican regulator to discuss Y2K contingency plan coordination and expects to take up work in this area soon.

Other countries with which the NRC has technical information exchange arrangements are being individually contacted by NRC regarding Y2K issues as part of the ongoing emergency preparedness information exchange. NRC is exploring the possibility of using existing bilateral means of communications as redundant communications channels should the regular international emergency response system fail during the Y2k transition period.

The Office of the Chief Information Officer prepared an information package to describe NRC's internal Y2K readiness program. OIP subsequently forwarded the information package to all countries with whom the NRC has bilateral safety cooperation arrangements.

CONGRESSIONAL AFFAIRS

Congressional interest in Y2K issues remains high. New letters this month include: 1) Senator Bennett (R-UT) of the Special Committee on the Year 2000 Technology Problem wrote requesting the status of the NRC's mission critical systems; 2) that same Committee jointly with the Senate Appropriations Committee wrote inquiring about NRC's continuity of operations and contingency planning, 3) Rep. Markey (D-MA) wrote suggesting additional actions the NRC should take with its licensees regarding Y2K, and 4) Senator Snowe (R-ME) wrote regarding NRC's Y2K requirements for licensees. Additionally, Rep. Luther's (D-MN) office called requesting basic NRC Y2K contacts in preparation for a town meeting he held in late March on Y2K at which he wants to distribute information on government-wide contacts. The Special Committee on the Year 2000 Technology Problem is planning a hearing for late April on "Y2K and Nuclear Issues" at which DOE and DOD will testify, focusing on nuclear concerns involving the U.S. and Russia. Lastly, that Committee issued a report, circulated on

March 3, summarizing its findings following a series of Y2K hearings last year. The report recommended that the NRC expand its detailed Y2K assessments to include all nuclear plants and broaden the scope of its assessments to include operational issues.

The STAR (Standing for Truth About Radiation) Foundation held a "Nuclear Y2K" symposium in Washington D.C. on March 8, 1999. The NRC staff provided a perspective on the Y2K issue. Other participants were the Union of Concerned Scientists, Nuclear Information and Resource Services, Pennsylvania Department of Environmental Protection, Environmental Coalition on Nuclear Power and Congressman Edward Markey, who sponsored the symposium.

PUBLIC AFFAIRS AND Y2K COMMUNICATION ACTIVITIES

As of mid-March, the NRC Web site was responding to approximately 5,800 page-requests per week for Year 2000 information. The most frequently-requested pages were:

NRC Year 2000 Page	33 percent of Y2K requests
Nuclear Reactors Y2K Page	15 percent of Y2K requests
Y2K Contingency Planning Page	10 percent of Y2K requests
NRC Y2K Contingency Plan	7 percent of Y2K requests
January 1999 EDO Y2K Status Report	4 percent of Y2K requests
NRC Y2K References Page	4 percent of Y2K requests

The Office of Public Affairs (OPA) has developed a list of frequently asked questions and responses that have been posted to NRC's Y2K website and forwarded to the President's Council on Y2K Conversion for posting to its website that provides consumer information. In addition, a Y2K communications plan has been developed to keep both the public and employees apprized of Y2K activities of the agency.

Cable News Network (CNN) interviewed members of the NRC staff on March 8 and March 29, 1999. The questions centered around the NRC's oversight of nuclear power plant licensee's Y2K remediation efforts.

On March 23, 1999, the agency issued a press release announcing NRC plans to review Y2K programs at all 103 nuclear plants and to conduct special contingency plan audits at six plants. The inspection results will be made publically available after the completion of the reviews At the recent training session, OPA briefed inspectors on public affairs aspects of Y2K.

The staff issued an internal yellow announcement to make employees aware of NRC's Y2K contingency plan, particularly with regard to staffing our emergency operations centers and expectations for facility site staffing on December 31, 1999. The announcement was signed by the EDO and posted on the LAN for all NRC employees.

Attachments:

1. Timeline of NRC Y2K Oversight Efforts
2. NEI Nuclear Utility Y2K Readiness - March 1999 Survey Summary

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January 19, 1999

MEMORANDUM TO: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

FROM: William D.Travers
Executive Director for Operations

SUBJECT: STATUS OF Y2K PROGRAMS AT NUCLEAR POWER PLANTS

The following is provided in order to update the Commission on the status of nuclear power plant licensee Y2K readiness programs and future staff efforts on this subject based on information obtained by the staff since the previous memorandum dated October 26, 1998. The staff notes that one critical transition date (12/31/98 to 1/1/99) included in Y2K readiness programs occurred without a reportable Y2K problem at a nuclear power plant.

Since late September 1998, the staff has been conducting the 12 planned sample audits of licensee Y2K programs. To date, 9 have been completed with the remaining 3 scheduled for completion by the end of January 1999. After completion of the audits, the staff plans to issue an information notice to inform licensees of the observations and lessons learned from the audits. Overall, the audits indicate that the industry is undertaking effective Y2K readiness efforts, and schedules are consistent with NRC expectations. The following observations and lessons learned from the audits to date were shared with licensees at the NEI sponsored workshop in Atlanta, GA on December 9 and 10, 1998. Most nuclear power plant licensees were in attendance at the workshop.

Observations:

1. Nuclear power plants are generally on schedule to be Y2K ready by July 1, 1999. Licensees are completing detailed assessments of Y2K susceptibility and are remediating/replacing mission critical systems as necessary. Some licensees have scheduled testing of some mission critical remediated systems for refueling outages in the Fall 1999, but all audited licensees have confirmed that their plants will be ready to operate on January 1, 2000. No Y2K problem in a safety-related actuation system has been identified.
2. Licensees have just begun their Y2K contingency planning. While this is an important part of the Y2K program, it is not overly time consuming, and sufficient time is available to complete the effort including the training of plant staff and exercising of the plans. However, because the staff has been unable to review detailed plans as part of the 12 plant sample audits, some additional follow up review of contingency planning will be conducted at several plants other than those in the 12 plant audit program in the Spring 1999.
3. Licensee management oversight of the Y2K readiness programs has generally been aggressive and is contributing to the success of Y2K readiness efforts. Management buy-in at all levels is essential to program effectiveness. Licensees are devoting the necessary resources to their programs to achieve their readiness schedules.
4. Independent assessments and/or peer reviews of licensee programs are very useful to the

effectiveness of the program. The continued significant sharing of work and information through owners groups and utility alliances is aiding in proper program implementation.

5. As part of their contingency planning, licensees are working with regional grid councils in order to provide for additional grid capacity in the event of loss of normally available power sources due to unanticipated Y2K problems.

Lessons Learned:

1. Central control of Y2K susceptibility testing reduces the chance for testing errors.
2. Tracking of remediation efforts should be consistent with the overall plant configuration management procedure thereby avoiding the introduction of possible future non-Y2K compliant software changes. Licensees should maintain configuration control for those systems and components identified for Y2K review under the program.
3. Independent verification and validation of Y2K readiness status of remediated mission critical systems is important to ensuring their proper function.
4. Reliance on vendor certification of Y2K readiness of nonsafety systems varies. While the staff believes that it is prudent for mission critical systems to receive Y2K susceptibility testing regardless of vendor confirmation of readiness, it is recognized that no regulatory basis exists to require such testing.
5. Coordination of plant specific Y2K readiness contingency plans with other licensee facilities and regional grid councils is essential to the Y2K readiness program.

By letter dated January 4, 1999, the Chairman informed NEI that the staff will issue a supplement to Generic Letter (GL) 98-01 consistent with the recommendation from NEI in their letter to the Chairman dated November 9, 1998. The supplement to GL 98-01 provides licensees with a voluntary alternative response on overall Y2K readiness of their plants in lieu of the more narrow response to GL 98-01 which refers only to readiness within the scope of the plant license and NRC regulations. This alternative response is due by July 1, 1999, as is the response to GL 98-01 and is consistent with the Year 2000 Information and Readiness Disclosure Act (Public Law No:105-271) which was enacted in October 1998, and which encourages information sharing on Y2K readiness in order to support the availability of the nation's infrastructure. The Commission Paper with the proposed GL 98-01 supplement was sent to the Commission on January 6, 1999.

The staff will review all licensee responses to either GL 98-01 or its supplement in July 1999. No independent audits of the responses are planned. However, based on the licensee's response and any other information available on Y2K readiness, the staff will determine the need for further plant specific follow up such as an onsite review, phone call or meeting with the licensee. For example, if a licensee indicates that significant mission critical system testing is required during a Fall 1999 outage or if it is unclear from the response what the status of facility readiness is, the staff may verify via an onsite review that sufficient time has been allotted for successful completion of testing prior to January 1, 2000, or that readiness has been achieved. In this way, the staff believes sufficient time is available to make any necessary decisions for further action on a plant specific basis by September 30, 1999 including a decision to shutdown a plant. Should the staff identify a situation where the Y2K problem results in a licensee being in noncompliance with the plant license or NRC regulations, appropriate action, including a shutdown order, can be taken as necessary.

In order to provide a more clearly defined decision rationale for addressing unresolved Y2K issues with individual licensees, the staff is working with OGC to develop criteria on which to base shutdown of a plant. The staff's initial thinking is to divide the plant systems into three categories depending on their function and establish criteria for actions to be taken including plant shutdown based on the impact of the unresolved Y2K concerns on the plant license and its compliance with NRC regulations. This criteria will be provided to the Commission, as appropriate, in the Spring 1999.

With the approval of the Commission, the staff released the Draft NRC Y2K contingency plan (COMSECY-98-036) to the public. The staff is obtaining comments on the document from stakeholders including NEI and FEMA in order to finalize the plan in the first quarter of 1999. A key issue on which the staff expects input is the question of evoking the provisions of 10 CFR 50.54 (x) versus the need to develop a policy on enforcement discretion for those unanticipated situations where a Y2K problem creates a condition outside the plant license yet shutdown of the plant, in order to maintain license compliance, may not be the desirable action in view of the recognized need for continued plant operation to ensure grid stability on January 1, 2000. The staff will address these options in the final NRC contingency plan.

The staff is also continuing its interactions with the President's Council on Y2K Conversion, other government agencies, international nuclear regulatory organizations and foreign governments on the Y2K problem. Attached for your information is a copy of The President's Council on Year 2000 Conversion, First Quarterly Summary of Assessment Information and extracted information *[pp. 23-25]* from the January 11, 1999, North American Electric Reliability Council's Y2K Status Report as it relates to nuclear power plants.

The staff attended a meeting of the Catastrophic Disaster Response Group at FEMA on December 16, 1998, at which a number of issues were discussed regarding Y2K contingency planning for the nation as a whole by the Federal government. Issues discussed included staffing of the FEMA headquarters operations center during the year 2000 rollover period, collection and dissemination of information on Y2K failures and events in other countries, and brokering of scarce resources if significant Y2K problems occur in certain areas of the country. FEMA is coordinating Federal government activities including conducting regional workshops and a national tabletop Y2K exercise in June 1999 in which all affected government agencies will participate. In addition to the above meeting, the staff met with the Canadian Atomic Energy Control Board in December 1998 to share information on Y2K contingency planning actions. The staff will also participate in the NEA international conference on the Y2K problem in nuclear power plants in Ottawa in February 1999 to exchange information and experiences on the Y2K problem and contingency planning efforts. Further, the staff continues to respond to public and media inquiries on its Y2K problem efforts with the assistance of OPA.

Of further note, on December 10, 1998, the staff received three petitions for rulemaking on the Y2K problem from the Nuclear Information and Resource Service. These petitions are being published in the Federal Register for public comment in accordance with the NRC procedures for handling rulemaking petitions. Because of the time constraints imposed by the nature of the Y2K problem, the staff is seeking prompt public input in order to make a timely decision on the need for a rule on the issue.

The staff will continue to provide periodic status reports to update the Commission on its Y2K efforts and the progress of nuclear power plant licensees on addressing the issue.

United States Nuclear Regulatory Commission

Status Report on Year 2000 Activities for August 1999

INTRODUCTION

This report is the eighth periodic report on the status of agency Y2K activities. The report covers the period from July 1 through July 31, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

By July 1, 1999, all 103 operating nuclear power plants reported status of Y2K readiness to the NRC. Regarding NRC's highest priority-the uninterrupted performance of plant safety systems-all nuclear power plants report that their efforts are complete, and that no remaining Y2K-related problems exist that could directly affect the performance of safety systems or the capability for safe shutdown. Sixty-eight of these plants had also completed the next order of priority as of July 1, stating that all of their computer systems that support plant operation are "Y2K ready." The remaining 35 plants reported that, to be fully Y2K ready, they still have additional work to complete on a few non-safety computer systems or devices. For about one half of those 35 plants, some work remains on systems needed for power generation. Other plants must perform remediation on plant monitoring and administrative systems. Typically, the remaining Y2K work is waiting on a scheduled plant outage in the fall, or delayed while awaiting the delivery of a replacement component. In each case, the licensees with work remaining have provided satisfactory schedules for completing that work.

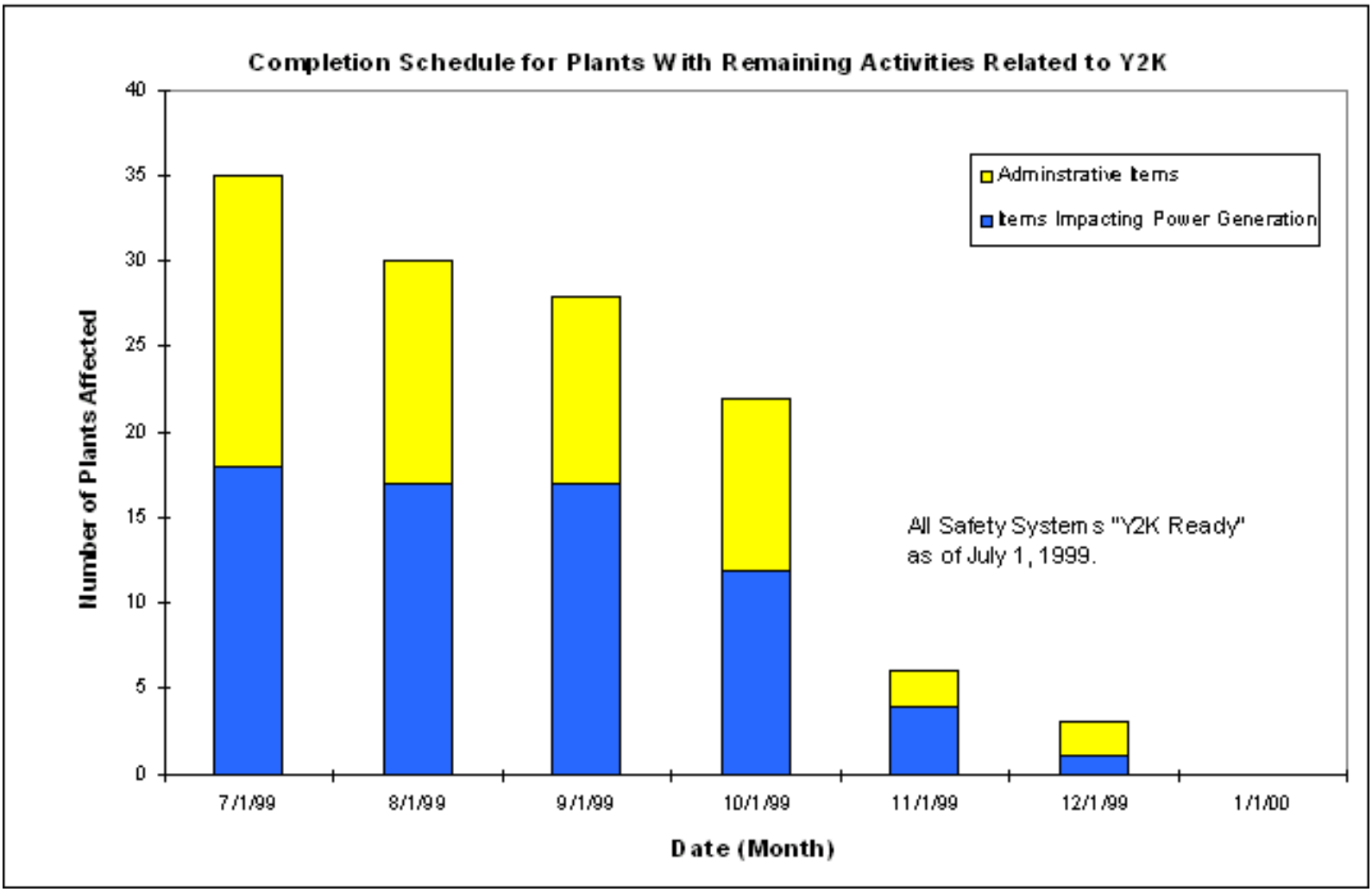
By July 30, five more plants reported Y2K ready, raising the total to 73. Table 1 lists those plants for which the licensee has provided written confirmation that the facility is Y2K ready. Table 2 provides a summary of remaining Y2K work items for those facilities that were not Y2K ready as of July 30, 1999. The information in Table 2 has been extracted from the recent licensee response to Generic Letter 98-01, Supplement 1 and, in some cases contains an initial staff assessment of the significance of the remaining work. Seventeen plants have work remaining on systems impacting power generation and 13 plants have work remaining on monitoring or administrative systems. Additional staff assessment and updated information and will be provided in a NUREG document scheduled to be issued by August 31, 1999.

The NRC issued a preliminary report on Nuclear Power Plant Y2K Readiness on July 19, 1999. This report integrated the results of the regional on-site reviews with the results of the initial staff review of licensee responses to GL 98-01, Supplement 1. This report has been placed on the NRC Web site. Audit reports for all six Headquarters audits of licensees Y2K contingency plans have been made publicly available and have also been posted on the NRC Y2K Web site.

During our integrated review of the responses to the GL 98-01 responses and the results of our independent inspection activities, we did not identify any significant inconsistencies or issues that required additional regulatory action. However, because we were not able to complete our assessment checklist at 14 plants, in large part due to the stage of readiness and program implementation of some of our licensees at the time of the inspection, we planned to conduct follow-up reviews at those 14 plants to provide additional confidence that implementation of their readiness activities is consistent with NRC-endorsed industry guidance. Follow-up reviews for eight of those plants have since been completed. Review activities are scheduled for the remaining six plants: Beaver Valley Units 1 and 2, Indian Point 2, Three Mile Island 1, Vermont Yankee, and Cooper. (The completion of these reviews will be reflected in the next report.)

The few plants that have Y2K work remaining are continuing to progress toward Y2K readiness. As of August 1, 1999, 5 more plants have reported that they are Y2K ready. These plants are Saint Lucie Units 1 and 2, Turkey

Point Units 3 and 4, and Monticello. As a result, only 30 plants still have Y2K work remaining and 73 plants are reporting Y2K readiness.



As depicted in the above chart, we expect this trend to continue. Based on the information available, by November 1, 1999, only six plants will have Y2K work remaining.

Of the 6 plants with remaining Y2K work after November 1, 1999, two (the DC Cook units) are in an extended plant shutdown (issues not related to Y2K) and have only minor Y2K work remaining on non-safety plant support systems, which the licensee plans to complete by December 15, 1999. These two units will remain shutdown during the Y2K transition. The four other plants (Brunswick Unit 1, Comanche Peak Unit 1, Salem Unit 1, and Farley Unit 2) require an outage to complete their Y2K activities. These outages have been scheduled and each of these licensees has successfully completed the most significant Y2K remediation activities on sister units.

The NRC will continue to monitor progress at those plants that have remaining work to be performed and will independently verify completion of these items, including Y2K contingency plans. By September 30, 1999, we will make a final determination whether additional regulatory action is warranted to address Y2K readiness issues. At this time, we believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000, and we do not anticipate the need for the NRC to direct any plant-specific action.

The staff is revising Temporary Instruction (TI) 2515\141 to include the necessary guidance to conduct followup reviews of the remaining non-safety items associated with 35 plants whose licensees reported they were not fully Y2K ready on July 1, 1999. The schedule for this effort is determined by the licensee's projected completion schedule.

The staff will attend a workshop sponsored by the North American Electric Reliability Council on August 5-6, 1999. The purpose of this workshop is to share information concerning Y2K issues. Co-sponsors of the workshop are EPRI, NEI, and others. At this workshop, the staff will give a presentation on the status of NRC Y2K activities.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

The Office of Nuclear Material Safety and Safeguards (NMSS) and DOE are working together to provide a single Federal government response to an IAEA Y2K Safeguards Questionnaire. NMSS previously responded to an IAEA Y2K Safety Questionnaire for Fuel Cycle Facilities.

NMSS representatives are scheduled to visit Portsmouth gaseous diffusion plant (GDP) the week of August 16, 1999, and Paducah GDP the week of September 20, 1999 to discuss Y2K readiness activities.

NMSS reviewed the third set of responses to Generic Letter 98-03. A summary of the responses is attached. The licensee for Allied Signal indicated, in a follow-up discussion, that their facility was Y2K ready by July 1, 1999.

A summary of the Y2K readiness status of major fuel cycle facilities follows. This information is based, in large, part on information contained in licensee /certificate holder response to Generic Letter 98-03 and is current as of July 28, 1999.

Site	Was Site Y2K Ready by July 1, 1999?	Will Site be Operating During Y2K Transition?	Systems That Need to be Made Y2K Ready or Percentage of Work Remaining to be Done	When Will Site be Y2K Ready?
AlliedSignal[1]	Yes	No	N/A	07/01/99
BXW Technologies	No	No	Badging and access systems Nuclear Criticality Safety Analysis Server	11/01/99
Combustion Engineering-Hematite	Yes	Unknown	N/A	07/01/99
Framatome Cogema Fuels	Yes	No	N/A	07/01/99
General Electric-Wilmington	No	No	Lab Measurement Control System	09/01/99
Nuclear Fuel Services	No	Unknown	Laboratory analysis equipment Materials Control and Accounting System Quality Control equipment Safety-Health Physics sampling equipment Security system equipment Other systems that are not safety nor security related	09/01/99

Siemens Power Corporation	No	Unknown	Inventory Control and Maintenance Tracking System Material Control and Accounting System Primary Process Control System for the Dry Conversion Process	10/01/99
United States Enrichment Corporation	Yes, for both GDPs	Yes, for both GDPs	N/A	07/01/99
Westinghouse Electric Company	No	No	Chemical Area Manufacturing Processing System Common Rod Manufacturing System Westinghouse Accountability, Tracking, and Traceability System Other systems that are not safety nor security related	10/01/99

[1] AlliedSignal responded that they would be Y2K Compliant by 12/31/99; however in a telephone conversation they indicated that they were Y2K Ready by July 1, 1999.

Notes: (1) NRC has inspected the Y2K status at the facilities in 1997 and 1998, in conjunction with other safety inspections

(2) NRC plans to conduct follow-up Y2K inspections at the GDPs in August and September, similar to those at the nuclear power plants

(3) NRC will have cognizant staff in the NRC Operations Center during the Y2K transition on December 31, 1999

(4) NRC will have a resident inspector at each GDP during the Y2K transition on December 31, 1999

CONTINGENCY PLANNING

On July 14th NRC conducted a Y2K Tabletop Exercise with Baltimore Gas and Electric, the State of Maryland and the counties surrounding the Calvert Cliffs nuclear power plant. The exercise tested Y2K contingency plan procedures against a number of scenarios, including loss of power and loss of telecommunications. The exercise confirmed that each participant had put a considerable amount of thought into preparing for potential problems during the Y2K transition. Although no major Y2K contingency plan inconsistencies were identified, there were a number of valuable observations and lessons from this tabletop. A synopsis of this exercise is on the Y2K web site (under Contingency Planning).

The staff is preparing for the full scale Y2K exercise. The exercise is scheduled for October 15th and will test all aspects of the Y2K contingency plan, including the use of back-up satellite communication systems and the sharing of information using the Y2K early warning system (YEWS). During this exercise the NRC Operations Center and the Regional Incident Response Centers will be staffed in accordance with the Y2K contingency plan. Approximately 10 licensees will simulate requests for enforcement discretion. In addition, at least two licensees (including one fuel cycle facility) will simulate an emergency because of a Y2K problem. The exercise will also involve a simulated Headquarters communication failure and transfer to the Region IV back-up Operations Center. Back-up communication systems between NRC headquarters, the regional Incident Response Centers and the resident inspectors will also be tested. The NRC auditorium will be established as a mock joint information

center (JIC) for the White House Information Coordination Center. Journalism students from local universities have been invited to play the role of the press. The NRC Information Coordination Center representative will provide briefings in the auditorium (simulated JIC) on the status of Y2K problems in the nuclear industry.

The staff placed the order for Iridium satellite phones and the phones were shipped to the Regions and Headquarters for inventory control tagging before being distributed. NRC's dedicated link from the National Telecommunication Coordinating Network to the Headquarters Operations Center was installed. FEMA recently announced plans to install NAWAS (National Warning System) circuits in all Federal Response Plan signatory Agencies (including NRC) as part of its Y2K preparedness effort. Details of this plan will be discussed at a meeting on August 17 at FEMA Headquarters.

The staff issued an information notice, IN 99-25, "Year 2000 Contingency Planning Activities" to nuclear power plant licensees and fuel cycle facilities providing information concerning the NRC's Y2K contingency plan.

INTERNATIONAL PROGRAMS

The staff has assisted the Nuclear Energy Agency in developing a prototype of an international Y2K early warning system (YEWS) that would be used by the NRC and other regulators to share information concerning Y2K problems that affect plant operation, telecommunications, or grid reliability. YEWS is a global Internet-based communications system allowing the rapid transmission of information on Y2K related occurrences affecting nuclear facility operations, local grid stability and telecommunications during the Y2K transition period.

The staff plans to place this system on a secure web server at a National Laboratory. A number of countries (most notably Japan, Taiwan, and South Korea) have already agreed to use this system as their primary means of disseminating information about nuclear power plant status during the Y2K transition. The staff has also been working with the President's Council on the Y2K Conversion, the Domestic Interagency Working Group, FEMA, DOE, NERC, and the Information Coordination Center to ensure that information that the NRC obtains during the Y2K transition will be effectively shared with the Executive Office and with appropriate Federal agencies.

Countries in earlier time zones, which will experience any Y2K-related problems before the U.S. does, have been invited to provide information to this system in the quickest possible manner to enable reactor operators in participating countries in later time zones to avoid common-cause failures. To date, this effort includes mainly Far Eastern countries which operate reactors designed by U.S. vendors, as well as some European countries, Canada and Mexico. The NRC Office of International Programs is using its bilateral agreement ties to invite countries outside of the CNRA and international nuclear organizations to participate in YEWS. Currently Japan, South Korea, Taiwan, several Western European countries, Canada and Mexico have agreed to participate in YEWS.

YEWS is being developed by the NRC in cooperation with the Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA). Recently, more formal co-ordination channels with the International Atomic Energy Agency (IAEA) were established and the IAEA provided comments on the system. Other discussions with the IAEA were focused on the co-existence and co-ordination of YEWS with the IAEA's fax-based emergency notification system. A video conference with NRC, NEA, and IAEA to discuss YEWS is scheduled for the week of August 9, 1999.

The YEWS prototype was first introduced to countries participating in the NEA's Committee on Nuclear Regulatory Agencies (CNRA) in March 1999 following an NEA sponsored international Y2K workshop in February 1999, which was also attended by regulators from the former Soviet Union and Central and Eastern Europe. The CNRA members are Belgium, Canada, Czech Republic, Finland, France, Germany, Hungary, IAEA, Japan, Netherlands, South Korea, Spain, Sweden, Switzerland, United Kingdom, and United States.

The final YEWS model was presented in June. Its design is based on comments received from CNRA countries, U.S. reactor operators and utilities, industry groups, the Departments of State and Energy, and internal NRC peer

review. Access to YEWS will be controlled by password. The system will reside on a secure server hosted by a national laboratory in the U.S.

The information received by the NRC through YEWS will be shared with licensees and the Departments of Energy and State, other Federal agencies as part of a coordinated Federal communication plan for the Y2K transition, and the Y2K Information Coordination Center which is being organized by the President's Council on the Year 2000 Conversion.

CONGRESSIONAL AFFAIRS

The Senate Special Committee on the Year 2000 Technology Problem invited Chairman Dicus to testify at a hearing focusing on the Year 2000 readiness of the electric power and gas industries. Due to the shortage of time before Congress departed for the August recess, the Committee decided to turn the hearing into its first "cyber hearing." Testimony from the witnesses has been posted on the Web rather than presented in a hearing format. Other witnesses included FERC and NERC.

PUBLIC AFFAIRS AND Y2K COMMUNICATION ACTIVITIES

An NRC press release titled "Nuclear Power Plants Report Safety Systems are Y2K Ready" was issued on July 7, 1999. Also, a summary of licensee reports on the status of Y2K readiness at nuclear power plants was placed on the NRC Web site.

An NRC press release addressing the "Interim Policy Statement on Enforcement Discretion for Y2K" was issued on July 22, 1999. The policy was noticed in the Federal Register on July 30, 1999.

The Cable News Network (CNN) interviewed the staff in the NRC Operating Center on July 7, 1999. The questions centered on the licensee responses to GL 98-01, Supplement 1.

The staff participated in a forum on "Y2K, Nuclear Plant Safety, and the Electric Power Grid." The forum was sponsored by the George Washington University Y2K group and hosted by The Washington Post Company. Other participants were David Lochbaum of The Union of Concerned Scientists, Paul Gunter and Mary Olson of the Nuclear Information and Resource Service (NIRS), James Davis of the Nuclear Energy Institute (NEI) and Paula Gordon of George Washington University. The discussions centered on the quality of NRC Y2K audits and reviews, reliability and availability of electrical power in nuclear power plants, and the petitions for rulemaking filed by NIRS.

As of the end of July, the NRC Web site continues to respond to approximately 3,000 page-requests per week for Year 2000 information. Currently, the most frequently-requested pages are:

NRC Year 2000 Page	34 percent of Y2K requests
Y2K Contingency Planning Page	11 percent of Y2K requests
Nuclear Reactors Y2K Page	9 percent of Y2K requests
Y2K Status of Power Plants	6 percent of Y2K requests
Y2K Frequently Asked Questions	5 percent of Y2K requests
NRC Y2K References Page	4 percent of Y2K requests

During the month of July, the NRC Year 2000 Page was the 12th most visited page, and the NRC Y2K Contingency Planning Page the 17th most visited page, on the NRC web site. Two PDF files, the Y2K Contingency Plan and the Y2K Status of Power Plants, were the 3rd and 7th most downloaded files, respectively, on the NRC web site.

October 26, 1998

MEMORANDUM TO: Chairman Jackson
Commissioner Diaz
Commissioner McGaffigan

FROM: William D.Travers
Executive Director for Operations

SUBJECT: STATUS OF Y2K PROGRAMS AT NUCLEAR POWER PLANTS

The following is provided in order to update the Commission on the status of nuclear power plant licensee Y2K readiness programs based on information obtained by the staff since the previous status memorandum dated September 22, 1998.

In late September 1998, the staff began the sample audits of licensee Y2K programs. The staff has scheduled 12 audits, with at least one hold point, in which the staff will assess what has been learned to date. This review will also determine the extent to which further audits will be needed, and whether the scope remains sufficient. If we complete all 12 audits, they will continue through January 1999.

The first audit was completed on September 18, 1998, at the Monticello plant and the audit report was issued on October 2, 1998, and is available to the public on the NRC external internet website. In the near future, the staff expects to issue the audit reports for the second and third audits which were conducted at the Seabrook and Brunswick plants during the weeks of September 28, 1998 and October 5, 1998, respectively. The staff noted that Northern States Power, the Monticello licensee, began their Y2K program at Monticello in June 1998, which is somewhat later than virtually all other licensees. Despite the late start, they appear to be able to achieve readiness per the Generic Letter (GL) 98-01 guidance based on limited computer use at the plant and assistance from the BWR Owners Group and a utility alliance. The staff has noted the following general observations from the audits to date:

1. The guidance in NEI/NUSMG 97-07 as endorsed in GL 98-01 results in an effective Y2K readiness program.
2. Management oversight and commitment in all aspects of the program is important to the success of the Y2K readiness efforts.
3. There is limited use of computers in mission critical (those essential to safety and continued operation) nuclear power plant systems.
4. Contingency planning efforts have barely begun but licensees are committed to the guidance in NEI/NUSMG 98-07 for this effort.
5. Sharing of information via owners groups and utility alliances is aiding licensees in their efforts.
6. Licensees should ensure that the Y2K readiness program at the plant interfaces properly with the corporate level program.

The above observations and others resulting from the audits will be used by the staff to determine the need for additional generic action beyond that already taken on the Y2K problem.

From October 7 through 9, 1998, members of the staff attended the semiannual Nuclear Utilities Software Management Group workshop and symposium on Y2K Readiness in Nuclear Power Plants in

Wilmington, NC. Most licensees were represented at the workshop and symposium. The workshop consisted of sessions on various specific Y2K readiness program topics including the detailed assessment process, embedded chip identification and susceptibility testing, and contingency planning. The staff presented information on the conduct of the Y2K readiness program audits and observations to date. At the symposium, members of various organizations with broader Y2K problem responsibilities made presentations on their activities and perspectives on the issue. These included presentations by NRC, DOE, NERC, NEI, Nuclear Utility Owners Groups, and regional electric grid reliability councils.

In addition to the above licensee Y2K readiness program oversight and interaction activities, in October 1998, the staff completed a draft of the proposed agency contingency plan describing those efforts the staff has developed to address potential unanticipated situations that may arise from Y2K problems at licensee facilities on January 1, 2000. The draft plan is currently receiving coordination between the various offices involved and will be provided to the Commission later this quarter.

The staff has also agreed to participate in an NEI sponsored workshop on the Y2K problem in Atlanta, GA on December 9 and 10, 1998. This workshop will provide a forum for the staff and licensees to share information on the results of the audits to that time, plant specific issues arising from Y2K program implementation, and questions licensees may have concerning the second GL 98-01 response due by July 1, 1999.

CONTACT: Jared S. Wermiel, NRR/DRCH
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United States Nuclear Regulatory Commission

Status Report on Year 2000 Activities for July 1999

INTRODUCTION

This report is the seventh periodic report on the status of agency Y2K activities. The report covers the period from June 1 through June 30, 1999. More detailed Y2K-related information and the previous periodic reports to the Commission can be found on NRC's Y2K website at http://www.nrc.gov/NRC/NEWS/year2000.html.

POWER REACTORS

Senior NRC staff met with representatives from the Nuclear Energy Institute (NEI) on June 15, 1999, to discuss the status of industry Y2K activities. NEI informed the staff that each licensee plans to respond to Supplement 1 to Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," dated January 14, 1999. This supplement provides a more encompassing voluntary alternative to the original generic letter. NEI representatives stated that no significant Y2K-related plant safety concerns have been identified at any nuclear power plant. Some typical Y2K issues scheduled for resolution past July 1 include upgrading of digital feedwater control systems, modification of safety parameter display systems, and improvements to security systems. The scheduled completion dates for these remaining Y2K activities are linked to vendor delivery or a scheduled outage to make a modification.

On June 18, 1999, NRC staff members briefed two members of the staff of the Senate Special Committee on the Year 2000 Technology Problem on industry and NRC Y2K activities. The briefing addressed industry actions in response to GL 98-01, NRC staff audits and reviews, expected reactor Y2K readiness status on July 1, 1999 and regulatory actions for reactors that are not fully Y2K ready. Copies of SECY-99-134 and SECY- 99-135, dealing with NRC contingency planning and enforcement discretion were provided to the Committee.

On June 22, 1999, the staff forwarded SECY- 99-162, "Policy for Regulatory Actions for Licensees of Nuclear Power Plants that have not Completed Year 2000 Readiness Activities" to the Commission. In the paper, the staff proposes criteria for regulatory action to help ensure proper oversight of nuclear power plants that have not completed their Y2K readiness activities, including remediation and contingency planning, by July 1, 1999.

During May 1999, the staff completed 3 contingency planning audits and in June 1999, completed the remaining 3 audits. June audits were conducted at Oconee, Diablo Canyon, and Duane Arnold. A report from each audit will be made publicly available and posted on the NRC Website. At all six sites, the staff found that the licensees had completed most of their contingency planning for internal events, external events and certain remediated actions. The staff concluded that the NEI/NUSMG 98-07 guidance was being followed at all sites.

The Regional staff continued Y2K site reviews and has forwarded the preliminary results of 54 reviews

to the Office of Nuclear Reactor Regulation (NRR) (as of June 22, 1999). Preliminary conclusions from these reviews indicate licensees are following plans that are consistent with the guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. Most assessment and remediation activities are complete. Some licensees have not completed contingency planning because they are concentrating their efforts on finishing detailed assessments of software applications and embedded components. The results of the Y2K site reviews and a discussion of the licensee responses to Generic Letter 98-01 will be consolidated into a single report. This report will be issued in August 1999.

The staff coordinated with licensees to receive GL 98-01 responses by fax or email on or before July, 1, 1999. The responses were evaluated and an initial summary of reactor Y2K readiness was made available in a July 7, 1999 press release. The press release indicated that the staff had received reports from all 103 operating plants indicating that there were no Y2K-related problems which directly affect the performance of safety systems. Sixty-eight of these plants indicated that all of their computer systems that support plant operation were "Y2K ready." At the remaining 35 plants, none of the work to be completed affects the ability of a plant to shut down safely, if needed.

For non-power reactors and decommissioned reactors with fuel stored on site, the staff held conference calls with each licensee to discuss the impact of the Y2K issue on their facility. From the licensees' responses to questions presented during these conference calls, the staff determined that these facilities were adequately prepared for the Y2K transition and no further NRC action was warranted.

The staff completed its review of the three Nuclear and Information and Resource Service (NIRS) petitions relating to Y2K. The staff's response to the petitions has been forwarded to the Commission.

FUEL CYCLE FACILITIES AND MATERIALS LICENSEES

On June 14, 1999, NRC Information Notice 99-18, "Update on NRC's Year 2000 Activities for Materials Licensees and Fuel Cycle Licensees and Certificate Holders" was issued to all material and fuel cycle licensees and certificate holders. NRC issued this information notice to update addressees regarding NRC's Year 2000 activities and provide sources of Year 2000 information.

On June 25, 1999, NRC Information Notice 99-20, "Contingency Planning for the Year 2000 Computer Problem" was issued to all material and fuel cycle licensees and certificate holders. NRC issued the information notice to encourage addressees to develop Year 2000 contingency plans.

A representative from the Office of Nuclear Materials Safety and Safeguards (NMSS) attended an International Workshop regarding "Safety Measures to Address the Year 2000 Issue at Medical Facilities which Use Radiation Generators and Radioactive Materials". Presentations on Y2K activities were provided by several member states. A presentation on NRC's Y2K activities was given and copies of Y2K information notices were provided to attendees. After the presentations, the workshop participants drafted a Y2K document. The document will provide more detailed information and supplement IAEA-TECDOC-1074, "Safety Measures to Address the Year 2000 Issues at Medical Facilities which Use Radiation Generators and Radioactive Materials," dated March 1999. The document and IAEA-TECDOC-1074 will be sent to member states, professional societies, and directly to medical institutions, if possible.

CONTINGENCY PLANNING

Work on implementing the NRC Y2K Contingency Plan is proceeding on an accelerated pace. The staff

has finalized plans for the July 14, 1999, Tabletop exercise and has issued letters to all of the participants. In the morning session of the exercise, the participants (NRC, FEMA, the State of Maryland, Baltimore Gas & Electric, and St. Mary's and Calvert County) will provide presentations on their respective Y2K Contingency Plans. In the afternoon, the exercise participants will discuss how their contingency plans deal with three different scenario focus areas: communications, plant operations, and command and control. The National Communications System is assisting the staff in developing a credible scenario for Y2K telecommunications problems. The NCS is also sending a representative to the Tabletop to discuss the National Telecommunications Coordination Network that will provide NRC with additional back-up communication capability in the event of a loss of the public switched network.

The staff plans to place an order for satellite phones by mid-July. These satellite phones will be provided to each resident inspector office, to the regional Incident Response Centers and to the Headquarters Operations Center. The staff is making provisions to ensure that the Iridium phones at Headquarters and in Region IV (the back-up to Headquarters during the Y2K transition) can be used indoors. Training for resident inspectors on the use of these phones is being planned in conjunction with the resident inspector seminars planned for the second half of 1999. Resident inspectors at sites participating in the October 15th exercise may receive training in advance of the resident inspector seminars, as necessary.

The staff plans to issue an information notice to nuclear power plant licensees by the end of July that provides specific implementing information concerning the NRC's Y2K contingency plan.

INTERNATIONAL PROGRAMS

The staff has assisted the Nuclear Energy Agency in developing a prototype of an international Y2K early warning system that would be used by the NRC and other regulators to share information concerning Y2K problems that affect plant operation, telecommunications, or grid reliability. The staff plans to place this system on a secure web server at a National Laboratory. A number of countries (most notably Japan, Taiwan, and South Korea) have already agreed to use this system as their primary means of disseminating information about nuclear power plant status during the Y2K transition. The Staff has also been working with the President's Council on the Y2K Conversion, the Domestic Interagency Working Group, FEMA, DOE, NERC, and the Information Coordination Center to ensure that information that the NRC obtains during the Y2K transition will be effectively shared with the Executive Office and with appropriate Federal agencies.

PUBLIC AFFAIRS AND Y2K COMMUNICATION ACTIVITIES

As of the end of June, the NRC Web site continues to respond to approximately 3,000 page-requests per week for Year 2000 information. Currently, the most frequently-requested pages are:

NRC Year 2000 Page	31 percent of Y2K requests
Y2K Contingency Planning Page	13 percent of Y2K requests
Y2K Frequently Asked Questions	9 percent of Y2K requests
Nuclear Reactors Y2K Page	7 percent of Y2K requests
Comm Paper on Enforcement Discretion	7 percent of Y2K requests
Press Release on Y2K Contingency Plan	7 percent of Y2K requests
NRC Y2K References Page	4 percent of Y2K requests

Approximately ten requests per day are being received for both the draft and the final version of the NRC

Contingency Plan for the Year 2000 Issue in the Nuclear Industry. Versions of this document were provided as attachments to COMSECY-98-036 and SECY- 99-134, respectively.

September 22, 1998

MEMORANDUM TO: Chairman Jackson
Commissioner Diaz
Commissioner McGaffigan

FROM: L. Joseph Callan
Executive Director for Operations

SUBJECT: STATUS OF Y2K PROGRAMS AT NUCLEAR POWER PLANTS

As discussed in SECY-98-04, on May 11, 1998, the staff issued NRC Generic Letter No. 98-01: Year 2000 Readiness of Computer Systems at Nuclear Power Plants, in order to gain assurance that licensees are effectively addressing the Y2K problem at their facilities.

In response to the generic letter, licensees of all operating reactors are required to submit a written response as follows:

1. Within 90 days of the date of this generic letter, submit a written response indicating whether or not you have pursued and are continuing to pursue a Y2K program similar to that outlined in NEI/NUSMG 97-07, augmented appropriately in the areas of risk management, contingency planning, and remediation of embedded systems. If your program significantly differs from the NEI/NUSMG guidance, present a brief description of the program(s) that have already been completed, are being conducted, or are planned to ensure Y2K readiness of the computer systems at your facility(ies). This response should address the program's scope, assessment process, plans for corrective actions (including testing and schedules), quality assurance measures, contingency plans, and regulatory compliance.
2. Upon completing your Y2K program or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready, or will be Y2K ready, with regard to compliance with the terms and conditions of your license(s) and NRC regulations. If your program is incomplete as of that date, your response should contain a status report, including completion schedules, of work remaining to be done to confirm your facility is/will be Y2K ready by the year 2000.

The staff has received all licensee responses to item (1) above and all the responses state that the licensee has pursued, and is continuing to pursue, a Y2K readiness program similar to that outlined in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," augmented appropriately in the area of risk management, contingency planning, and remediation of embedded systems. NEI/NUSMG 97-07 recommends methods for utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license.

The Nuclear Energy Institute, in collaboration with the Nuclear Utilities Software Management Group, recently issued a new guidance document, NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," dated August 1998 which incorporates guidance in the areas of contingency planning, business continuity and risk management. The staff reviewed NEI/NUSMG 98-07 and finds that it provides good guidance for licensee use in augmenting the Y2K readiness program in the areas of contingency planning. It is expected that all nuclear power plant licensees will incorporate NEI/NUSMG 98-07 into their Y2K readiness programs.

As follow-up to NRC Generic Letter 98-01, starting in September 1998, the staff plans to conduct sample audits at 12 plant sites of licensee plant-specific Y2K readiness program implementation, to assess the effectiveness of the program. The plant sites selected and the corresponding scheduled dates for the audits are as follows:

Braidwood 1 & 2	January 1999
Brunswick 1 & 2	October 1998
Davis Besse	October 1998
Hope Creek	October 1998
Limerick 1 & 2	November 1998
Monticello	September 1998
North Anna 1 & 2	January 1999
Seabrook	September 1998
Waterford	December 1998
Watts Bar	November 1998
WNP-2	January 1999
Wolf Creek	November 1998

The audit will focus on those areas of the program affecting plant safety first followed by those areas important to safety including continued plant operation. Licensee contingency planning will be reviewed during the audits. The present schedule is to complete the audits in January 1999. Based on the results of the review of licensee Y2K programs from these audits, the staff will determine the need for additional generic action, particularly in the area of operational safety, beyond that already underway.

Additionally, the staff is working with NEI to conduct a Y2K workshop at which the staff will exchange information with NEI and industry representatives, including the results of the completed audits. The workshop is tentatively planned for December 1998.

Each licensee will provide confirmation of Y2K readiness and compliance with its license with respect to the Y2K problem in July 1999 when the second response to GL 98-01 is due. Per GL 98-01 if the facility-specific Y2K readiness program is incomplete as of July 1, 1999, the licensee response must include a status report, including completion schedules, of work remaining to be done to confirm that the facility is/will be Y2K ready by the year 2000. The staff expects to complete its review of the second GL 98-01 responses by September 1999 and any unresolved safety issues would be promptly addressed at that time.

The staff has also begun to develop an agency contingency plan in order to prepare for the need to respond to potential events resulting from unanticipated Y2K problems. This plan will be coordinated with the necessary organizations both internally and externally, and will be communicated to the Commission in the future.

The staff has also begun to develop an agency contingency plan in order to prepare for the need to respond to potential events resulting from unanticipated Y2K problems. This plan will be coordinated with the necessary organizations both internally and externally, and will be communicated to the Commission in the future.

CONTACT: Jared S. Wermiel, NRR/DRCH

(301) 415-2821

U. S. NUCLEAR REGULATORY COMMISSION

APPENDIX C OF SECY-97-213

YEAR 2000 AND FUEL CYCLE AND MATERIALS LICENSEES

SCOPE OF THE YEAR 2000 PROBLEM FOR FUEL CYCLE AND MATERIALS LICENSEES

For fuel cycle and materials licensees, the scope of the Year 2000 potential problem involves security concerns, such as perimeter and other alarm systems that are computer controlled; material control and accounting concerns, such as automatic data systems that track inventories within the facility and record materials leaving the facility; and patient treatment concerns, such as calibration and treatment planning on equipment used for diagnostic and therapeutic medical applications, e.g., in hospitals and clinics.

STATUS OF THE YEAR 2000 PROBLEM FOR FUEL CYCLE AND MATERIALS LICENSEES

Most of the information concerning the current state of knowledge and activities by licensees has been gathered through informal means.

Fuel cycle licensees know about the Year 2000 problem, but they have not informed NRC of any significant problems that they have identified or corrected to date.

Informal contacts with several (approximately seven) large and small nuclear gauge manufacturers have revealed that they will have no Year 2000 problems. Most manufacturers indicated that either the programming or microprocessors do not perform functions that require a 4-digit date field or they already use 4-digit dates that will function correctly after the year 2000. Although the responses to these informal surveys have been positive, the possibility exists that some other manufacturers may have problems.

An informal conversation with an instructor of users of high-dose-rate (HDR) remote after-loading machines (used in medical brachytherapy therapeutic treatments) revealed that one manufacturer of HDR units, Nucletron, has already addressed the Year 2000 problem. Specifically, the treatment planning and source decay software utilize a 4-digit date field.

ISSUES CONSIDERED MOST SIGNIFICANT

Although each of the concerns noted above is important, we consider that the most significant concerns are those related to patient treatment. In this area, a large number of users of radioactive materials for medical diagnosis and treatment are involved, as well as a number of manufacturers of medical diagnostic and therapeutic equipment that contains computerized measurement and recording devices. The potential impact of failure of these devices due to Year 2000 problem is large, based on their widespread use throughout the country in hospitals and clinics.

STRATEGY FOR DEALING WITH THE PROBLEM

Beginning in November 1996, NMSS has moved forward to alert licensees to the Year 2000 concerns and to emphasize their potential safety significance. On December 24, 1996, NMSS and NRR issued NRC Information Notice 96-70, "Year 2000 Effect on Computer System Software," which provided licensees, certificate holders, and registrants with background information on the Year 2000 problem and urged them to take appropriate action. Names and phone numbers of technical contacts were provided, along with brief instructions on using the NRC's World Wide Web page to obtain additional information.

Also, licensees were encouraged to post questions, problems identified, and solutions on a NRC-maintained list server. Letters were also sent to nine professional organizations with copies of the information notice, asking the organizations to make the information available to their members. In July 1997, NMSS incorporated an inspection item on the Year 2000 issue into pilot Inspection Procedure 87115, "Nuclear Medicine Programs." As other inspection procedures on licensed materials programs are updated, this item will also be incorporated. This activity is expected to be completed in early 1998.

In addition, the June/July 1997 issue of the NMSS Licensee Newsletter included an article on and a copy of the June 25, 1997, letter from the U.S. Food and Drug Administration (FDA) to medical device manufacturers which alerted them to the fact that some computer systems and software applications, including microprocessors may be affected by the Year 2000 problem. The FDA letter also mentioned that computer-controlled design, production, or quality control processes could be adversely affected. Medical device manufacturers were reminded of their responsibilities with respect to device performance and encouraged to conduct hazard and safety analyses to determine Year 2000 compliance. On August 6, 1997, NMSS issued NRC Information Notice 97-61, "U.S. Department of Health and Human Services Letter to Medical Device Manufacturers," on the Year 2000 problem. This information notice was sent to all NRC medical licensees, and to veterinarians and manufacturers/distributors of medical devices, providing them copies of the FDA June 25 letter and providing them with the FDA's point of contact for information. No specific action or response on the part of licensees was required by this information notice.

More recently, to obtain additional information on the activities of materials, medical, and fuel cycle licensees, NMSS is implementing the following plan. A meeting of NMSS divisions was held to determine the extent of current knowledge of licensee activities and how to best acquire additional information on licensee activities. NMSS will begin, shortly, with the assistance of an individual from the Office of Nuclear Regulatory Research, to assess the status of selected licensees' activities for dealing with the Year 2000 problem and to note any problems identified through the licensees' efforts. A list of generic questions (questionnaire) is being developed that will be used for the assessment. The first such visit will be to a large broad-scope materials licensee. Subsequently, NMSS will assess the feedback from that visit, and adjust our approach, if necessary. Other licensees to be contacted may include the National Institutes of Standards Technology (NIST), one of the gaseous diffusion plants, and a fuel manufacturer. Following the evaluation of licensee responses to the questionnaire, NMSS will assess the need to issue more information notices or to take other actions, as appropriate.

In addition, NMSS is identifying vendors of medical devices to ascertain what actions they have taken or plan to take in regard to the Year 2000 problem.

The main focus of our activities in the near term will be to sensitize licensees to the Year 2000 problem, to gain an understanding of any safety and safeguards problems identified by the licensees, and to share that information with the industry.

NRC YEAR 2000 CONTACT:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

August 6, 1997

NRC INFORMATION NOTICE 97-61: **U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES LETTER, TO MEDICAL DEVICE MANUFACTURERS, ON THE YEAR 2000 PROBLEM**

Addressees

All U.S. Nuclear Regulatory Commission medical licensees, veterinarians, and manufacturers/ distributors of medical devices.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to inform licensees of a letter from the U.S. Department of Health and Human Services, Food and Drug Administration (FDA), to medical device manufacturers, about the Year 2000 problem. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid potential problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances

In a letter dated June 25, 1997 (attached), the FDA reminded medical device manufacturers that some computer systems and software applications currently used in medical devices, including embedded microprocessors, may experience problems as a result of the turn to the new century. In addition, the letter indicated that computer-controlled design, production, or quality control processes could be adversely affected.

Discussion

The FDA requires the manufacturers it regulates to investigate and correct problems with medical devices that present a significant risk to public health. To ensure the continued safety and effectiveness of medical devices, the FDA recommended that manufacturers take the following actions: (1) ensure that medical devices submitted for premarket approval can perform date recording and computations that will not be affected by the Year 2000 problem; (2) conduct hazard and safety analyses on currently manufactured devices to determine whether device performance could be affected by the Year 2000 problem, and, if so, take appropriate steps to correct production and help customers who have purchased such devices; and (3) check design, production, and quality control processes to ensure year 2000 compliance. This letter also applies to those manufacturers that use radioactive material in their medical devices.

If there are any questions about medical device manufacturers' responsibilities regarding the Year 2000 problem, contact the FDA's Center for Devices and Radiological Health, Division of Small Manufacturers Assistance, by phone, at 1-800-638-2041 or fax, at 301-443-8818. Also, an electronic

copy of the letter is available on the FDA's World Wide Web home page at http://www.fda.gov/cdrh.

Related Generic Communications

NRC Information Notice 96-70, "Year 2000 Effect on Computer System Software," issued on December 24, 1996, addressed the Year 2000 problem and its applicability to NRC licensed programs.

This information notice requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

signed by

Donald A. Cool, Director
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards

Technical contact: Patricia K. Holahan, NMSS
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(NUDOCS Accession Number 9707310130)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

August 12, 1998

NRC INFORMATION NOTICE 98-30:	EFFECT OF THE YEAR 2000 COMPUTER PROBLEM ON NRC LICENSEES AND CERTIFICATE HOLDERS

Addressees:

All material and fuel cycle licensees and certificate holders.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to remind all addressees of the potential problems their computer systems and software may encounter as a result of the change to the year 2000. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid potential problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances:

The Year 2000 (Y2K) problem pertains to the potential inability of computers to correctly recognize dates beyond December 31,1999. This problem results from computer hardware and/or software that uses two-digit fields to represent the year. These systems may misread the year 2000 and cause the systems to fail, generate faulty data, or act in an incorrect manner. The Y2K problem has the potential to interfere with the proper operation of any computer system, hardware that is microprocessor-based (embedded software), software, or database.

As discussed in this Information Notice, "Y2K Ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000, even though the computer system or application is not Y2K Compliant. A Y2K Readiness Program is a plan for a facility to become Y2K Ready. "Y2K Compliant" is defined as a computer system or application that accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the years 1999 and 2000, and beyond, including leap-year calculations.

The Y2K problem is urgent because it has a fixed, non-negotiable deadline that is quickly approaching. This matter requires priority attention because of the limited time remaining to assess the magnitude of the problem, assess its associated risks, and implement programs that will achieve a satisfactory resolution of the Y2K problem.

Existing reporting requirements under 10 CFR Part 21 provide for notification to NRC of deficiencies, non-conformances, and failures, such as the Y2K problem in safety-related systems.

Examples of systems that may be affected by the Y2K problem include:

- Treatment planning systems
- Dose calibrators

- Embedded systems
- Decay programs
- Physical Protection
- Analytical systems that rely on microprocessors and software controls
- Interlocks
- Material Control and Accounting
- Emergency response systems
- Radiation monitoring systems
- Dosimeters, dosimetry programs, and readers
- Communication systems
- Surveillance and maintenance tracking systems

To alert licensees and certificate holders to the Y2K problem, NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996, and IN 97-61, "U.S. Department of Health and Human Services Letter, to Medical Device Manufacturers, on the Year 2000 Problem," on August 6, 1997. In IN 96-70, the staff described the potential problems that computer systems and software may encounter as a result of the change from the year 1999 to the year 2000 and how the Y2K issue may affect NRC licensees and certificate holders. IN 96-70 encouraged licensees and certificate holders to examine their uses of computer systems and software well before the year 2000 and suggested that they consider appropriate actions to examine and evaluate their computer systems for Y2K vulnerabilities. In IN 97-61, the staff forwarded to licensees a letter from the U.S. Department of Health and Human Services, Food and Drug Administration (FDA), to medical device manufacturers, regarding the Y2K problem. In a letter dated June 25, 1997, the FDA reminded medical device manufacturers that some computer systems and software applications currently used in medical devices, including embedded microprocessors, may experience problems as a result of the turn to the new century. In addition, the letter indicated that computer-controlled design, production, or quality control processes could be adversely affected.

As part of NRC's response to the Y2K problem, NRC assembled a Y2K team to gather more information on the Y2K programs of materials and fuel cycle licensees and certificate holders. In addition, materials and fuel cycle inspectors have been instructed to confirm receipt of NRC's INs 96-70 and 97-61, by materials and fuel cycle licensees and certificate holders; determine whether the licensees and certificate holders have identified any potential problems associated with the Y2K issue; and note any corrective actions taken by the licensees and certificate holders.

Discussion:

There are several concerns associated with the potential impact of the Y2K problem because of the variety and types of computer systems and software in use. For example, the role and use of computers and embedded systems in: (1) treatment planning systems; (2) dose calibrators; (3) programmable logic controllers and other commercial off-the-shelf software and hardware; (4) document control systems; (5) process control systems; (6) engineering calculations; and (7) systems for the collection of operating and post-accident site parameter data. Licensees should develop contingency plans for systems that are not

Y2K Ready.

Some treatment planning systems and dose calibrators have been found not to be Y2K Compliant by the manufacturer. Addressees should contact their treatment planning system and dose calibrator venders to determine if their systems are Y2K Ready. Further, addressees should verify that their treatment planning systems and dose calibrators are Y2K Ready.

Some systems that have been determined to be Y2K Compliant by the manufacturer have been found not to be Y2K Compliant by the end user. Conversely, some systems that have been determined not to be Y2K Compliant by the manufacturer have been found to be Y2K Ready by the end user. Further, devices that are the same model may have microprocessors from different manufacturers which may cause the devices to behave differently in the year 2000. Addressees should not rely completely on manufacturers certification. Y2K Readiness is also dependent on the manner in which the system is used. Again, addressees should verify that all of their systems are Y2K Ready.

Applications that have no apparent date manipulation algorithms may still be affected by a Y2K problem. For example, a subroutine that date-stamps the header information in archival tapes, regardless of the rest of the content of the tape, may be affected. In addition, individual systems may be "date-safe," but the integrated operations that the systems support may be vulnerable to the Y2K problem. Therefore, after testing a subsystem for Y2K compliance, a functional test of the entire system should be performed.

The following elements can be used to aid in the development of a successful Y2K Readiness Program: (1) management planning; (2) implementation; (3) quality assurance (QA); (4) regulatory considerations; and (5) documentation. The components for planning include management awareness, sponsorship, project leadership, project objectives, project management team, management plan, project reports, interfaces, resources, and oversight. The phases of implementation include: awareness; initial assessment (e.g., inventory, categorization, classification, prioritization, and analysis); detailed assessment (e.g., vendor evaluation, software evaluation, interface evaluation, remedial planning); remediation; testing and validation; and notification. The features of QA include project management QA as well as implementation QA. The aspects of regulatory considerations include the performance and documentation of appropriate reviews and/or evaluations. The elements of documentation of activities and results include project management documentation, vendor certifications, inventory lists, checklists, and record retention.

There are three reference documents that may help licensees and certificate holders with their Y2K Readiness Programs. The General Accounting Office published "Year 2000 Computing Crisis: An Assessment Guide," in September 1997 and "Year 2000 Computing Crisis: Business Continuity and Contingency Planning. Exposure Draft," in March 1998 <http://www.gao.gov/special.pubs/publist.htm> as general business tools; and the Nuclear Energy Institute published NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," in October 1997 <http://www.nrc.gov/NRC/Y2K/NRCNEI/NEI9707.html> to assist nuclear power plants in the development of their Y2K Readiness Programs. Even though the latter applies to commercial nuclear power plants, the general discussion of the elements in Y2K Readiness Programs could be beneficial to other business entities.

NRC has certified that its Nuclear Material Management Safeguards System (NMMSS) is Y2K Compliant. For NRC licensees and certificate holders required to report nuclear material transactions to NMMSS, from May 1, 1998, through mid-1999, NMMSS will operate in a manner that allows all nuclear

material transaction reports to NMMSS to be either in the current two-digit year reporting format or in the Y2K Compliant four-digit year format. After mid-1999, only the Y2K Compliant format will be acceptable. Licensees and certificate holders that use their own software to input data into NMMSS will have to modify it themselves, to be Y2K Compliant.

The U.S. Food and Drug Association has established a web site <http://www.fda.gov/cdrh/yr2000> to provide information regarding the status or impact on product performance of the "Year 2000 Date Problem" for medical devices and scientific laboratory equipment (biomedical equipment). The information provided, or the linked sites maintained by manufacturers, have been provided by the manufacturers of the products in response to the January 21, 1998, request from the Deputy Secretary of the Department of Health and Human Services.

Many manufacturers have web sites that contain Y2K information regarding their products. This information may include information on products that are not Y2K Compliant and the availability of product updates. Attachment 1 contains a list of websites that may be useful in addressing the Y2K problem.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

/s/'d by
Frederick C. Combs, Acting Director
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards

Contact: Gary Purdy, NMSS
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Attachments:
1. Selected Year 2000 Web Sites
2. List of Recently Issued NMSS Information Notices
3. List of Recently Issued NRC Information Notices

(NUDOCS Accession Number 9808070136)

ATTACHMENT 1

IN 98-30
August 12, 1998

Selected Year 2000 websites

<http://www.fda.gov/cdrh/yr2000/year2000.html>	medical device manufacturers list of Y2K compliant and non-compliant devices

<http://www.gao.gov/special.pubs/publist.htm>	two Y2K reports
<http://www.nist.gov/y2k>	Y2K information, test programs
<http://www.nrc.gov/NRC/NEWS/year2000.html>	Information Notices, Generic Letters, links, NEI Report
<http://www.iee.org.uk>	embedded software information
<http://www.open.gov.uk/bug2000.htm>	software compliance information
<http://www.rx2000.org>	medical issues (not much radiation protection)
<http://www.sph.umich.edu/group/eih/UMSCHPS/commercial/>	links to manufacturers and dosimetry companies
<http://www.intravsn.com/vendors.shtml>	Links to Oncology/Radiology Commercial Sites

Except for its own website, the U.S. Nuclear Regulatory Commission makes no claims of the accuracy in the information provided at these websites. The list of sites is provided for use by addressees as a possible source of Y2K information.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

June 14, 1999

NRC INFORMATION NOTICE 99-18:	UPDATE ON NRC's YEAR 2000 ACTIVITIES FOR MATERIALS LICENSEES AND FUEL CYCLE LICENSEES AND CERTIFICATE HOLDERS

- Addressees:
- Purpose:
- Description of Circumstances:
- Discussion:
- Related Generic Communications:

Addressees:

All material and fuel cycle licensees and certificate holders.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to update addressees regarding NRC's Year 2000 (Y2K) activities and provide sources of Y2K information. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid potential problems. However, suggestions contained in this IN are not NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances:

The Y2K problem pertains to the potential inability of computers to correctly recognize dates beyond December 31,1999. This problem results from computer hardware and/or software that uses two-digit fields to represent the year. These systems may misread the year 2000 and cause the systems to fail, generate faulty data, or act in an incorrect manner. The Y2K problem has the potential to interfere with the proper operation of any computer system, hardware that is microprocessor-based (embedded software), software, or database.

The Y2K problem is urgent because it has a fixed, non-negotiable deadline that is quickly approaching. This matter requires priority attention because of the limited time remaining to assess the magnitude of the problem, assess its associated risks, and implement programs that will achieve a satisfactory resolution of the Y2K problem.

Existing reporting requirements under 10 CFR Part 21 provide for notification to NRC of deficiencies, non-conformances, and failures, such as the Y2K problem, in safety-related systems.

As part of NRC's response to the Y2K problem, NRC assembled a Y2K team to gather more information

on the Y2K programs of materials and fuel cycle licensees and certificate holders. During each interview, the licensee or facility representative indicated that they were aware of the Y2K issue and were in various stages of implementing their Year 2000 Readiness Program.

NRC learned that some early versions of treatment planning systems have Y2K problems, and upgrades for the systems were available. Treatment planning systems are regulated by the U.S. Department of Health and Human Services, Food and Drug Administration (FDA), not NRC, although both agencies are sharing Y2K information. For materials licensees, no Y2K issues for NRC-regulated material were identified by the Y2K team. For fuel cycle facilities, a database was identified, by a facility, that had a Y2K problem. The facility indicated that they would convert to a Y2K-compliant database as part of their Y2K readiness program.

In addition, materials and fuel cycle inspectors have been instructed to confirm receipt of NRC's INs, by materials and fuel cycle licensees and certificate holders; determine whether the licensees and certificate holders have identified any potential problems associated with the Y2K issue; and note any corrective actions taken by the licensees and certificate holders.

Discussion:

NRC staff has several concerns associated with the potential impact of the Y2K problem on materials licensees, primarily because of the variety and types of computer systems and software in use. Licensees need to be aware of Y2K effects on health and safety, as well as regulatory requirements such as record-keeping.

The Y2K problem may affect hardware, software, embedded systems, and networks. Examples of systems that may be affected by the Y2K problem include:

- Treatment planning systems;
- Dose calibrators;
- Nuclear Medicine dose/operational management systems
- Programmable logic controllers;
- Commercial off-the-shelf software and hardware;
- Document control systems;
- Safeguards (Material Control and Accounting and Physical Protection) systems;
- Security computers and systems;
- Plant process (data scan, log, and alarm) display system computers;
- Safety parameter display system computers;
- Emergency response systems;
- Radiation monitoring systems;
- Dosimeters and readers;
- Engineering programs and systems;
- Communication systems;
- Inventory control systems;
- Surveillance and maintenance tracking systems; and

- Control systems.

Applications that have no apparent date manipulation algorithms may still be affected by a Y2K problem. For example, a subroutine that date-stamps the header information in archival tapes, regardless of the rest of the content of the tape, may be affected. In addition, individual systems may be "date-safe," but the integrated operations that the systems support may be vulnerable to the Y2K problem. Therefore, after testing a subsystem for Y2K compliance, a functional test of the entire system should be performed.

As part NRC's Y2K program, the Office of Nuclear Material Safety and Safeguards is monitoring several list servers, manufacturer websites, news articles, Congressional reports, and the President's Y2K Council reports for Y2K issues that may affect materials licensees. Materials inspectors are continuing to make Y2K inquiries during routine inspections. To date, only treatment planning systems, dose calibrators, and a tote position display for an irradiator have been identified through the inspection process as having Y2K problems. NRC has informed the FDA of all treatment planning systems and dose calibrators that have been linked to Y2K problems. Upgrades for these treatment planning systems and dose calibrators are available from manufacturers. Treatment planning systems are regulated by the FDA not the NRC. Materials inspectors have indicated that licensees are aware of the upgrades. The irradiator tote position display is not a safety system. Further, this system is a one-of-a-kind modification made by the licensee (the licensee was authorized by NRC to make the modifications). The licensee is updating the tote position display system to eliminate the Y2K problem. Although no generic Y2K issues for NRC-regulated material used by materials licensees have been identified, materials licensees need to continue implementation of their Y2K readiness programs.

Between September 1997 and October 1998, the major fuel cycle facilities were asked Y2K questions during other inspections. Based on these Y2K inspections, the facilities were aware of the Y2K problem and were adequately addressing Y2K issues.

In June 1998, NRC issued Generic Letter (GL) 98-03, "NMSS Licensees' and Certificate Holders' Year 2000 Readiness Programs," which requested written confirmation by December 31, 1998, from the major fuel cycle facilities that their computer systems were Y2K-ready and that they could operate safely before and after January 1, 2000. The GL also requested that if a facility was not Y2K-ready by December 31, 1998, a status report and schedule for remaining work would be sent to NRC by July 1, 1999.

Each major fuel cycle facility has responded to the GL and stated that they have implemented a Y2K readiness program. No facility stated that they were Y2K-ready by December 31, 1998; however, each facility has indicated that they will be Y2K-ready well before January 1, 2000. There have been no identified risk-significant Y2K concerns for fuel cycle facilities.

Finally, the International Atomic Energy Agency (IAEA) with the cooperation of the World Health Organization (WHO), is holding an International Workshop on "Safety Measures to Address the Year 2000 (Y2K) Issue at Medical Facilities which use Radiation Generators and Radioactive Materials", in Vienna, Austria, on June 28-30, 1999. The workshop will address the experiences of those who have already taken steps to assess and remediate the Y2K problem. The workshop program is largely based on a technical document (TECDOC-1074), published by the IAEA. Authorities in Member States of the IAEA and WHO and professional societies (radiotherapy, nuclear medicine, medical physics, radiation protection) will be invited by IAEA to participate.

Additional information, registration materials, and a downloadable version of TECDOC-1074 may be found at the IAEA website.

Attachment 1 contains brief descriptions and addresses of selected Y2K websites. Many manufacturers have websites that contain Y2K information regarding their products. Manufacturers' websites may include information on products that are not Y2K-compliant, and the availability of product updates. Government and professional organization websites that may be useful in addressing the Y2K problem are also included.

Related Generic Communications:

To alert licensees and certificate holders to the Y2K problem, NRC issued three Information Notices.

IN 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996 described the potential problems that computer systems and software may encounter as a result of the change from the year 1999 to the year 2000 and how the Y2K issue may affect NRC licensees and certificate holders. IN 96-70 encouraged licensees and certificate holders to examine their uses of computer systems and software well before the year 2000 and suggested that they consider appropriate actions to examine and evaluate their computer systems for Y2K vulnerabilities.

In IN 97-61, "U.S. Department of Health and Human Services Letter, to Medical Device Manufacturers, on the Year 2000 Problem," on August 6, 1997 the staff forwarded licensees an FDA letter sent to medical device manufacturers, regarding the Y2K problem. In the letter, dated June 25, 1997, FDA reminded medical device manufacturers that some computer systems and software applications currently used in medical devices, including embedded microprocessors, may experience problems as a result of the turn to the new century. In addition, the letter indicated that computer-controlled design, production, or quality control processes could be adversely affected.

IN 98-30, "Effect of the Year 2000 Computer Problem on NRC Licensees and Certificate Holders," on August 12, 1998 alerted licensees to systems that may be affected by Y2K and systems known to be affected by the Y2K problem. IN 98-30 encouraged licensees to contact vendors and test their systems for Y2K problems. Finally, IN 98-30 provided elements of a Y2K readiness program.

This information notice requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contacts listed below, or the appropriate regional office.

/s/'d by

Donald A. Cool, Director
Division of Industrial and Medical Nuclear Safety
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Attachments: 1. Selected Year 2000 Websites
2. List of Recently Issued NMSS Information Notices
3. List of Recently Issued NRC Information Notices

(NUDOCS Accession Number 9906080065)

ATTACHMENT 1

IN 99-18
June 14, 1999

SELECTED YEAR 2000 WEBSITES

1. The American Hospital Association conducted a survey of hospital Y2K readiness status. The results of the survey can found at the American Hospital Association's website. <http://www.aha.org/y2k>

2. The American Medical Association website has Y2K information for the medical community. <http://www.ama-assn.org/not-mo/y2k/index.htm>

3. The Federal Communications Commission website provides information regarding the effects of Y2K on the communications and broadcasting industry. <http://www.fcc.gov/year2000/>

4. The Food and Drug Administration has placed reports of Y2K-compliant and non-compliant medical devices on its website. The reports are organized by manufacturer. <http://www.fda.gov/cdrh/yr2000/year2000.html>

5. The General Accounting Office has placed Y2K reports on assessment, testing, and contingency planning on its website. <http://www.gao.gov/y2kr.htm>

6. The Health Care Financing Administration has placed Y2K information for health care claim repayments for Medicare, Medicaid, and Child Health Insurance Programs on its website. The site also includes the Y2K status of health care facilities, Y2K activities, and Y2K help for health care facilities. <http://www.hcfa.gov>

7. The Institution of Electrical Engineers Y2K website provides information on embedded systems. The site explains the use of Y2K risk management techniques. <http://www.iee.org.uk>

8. The intraVision website provides links to Oncology/Radiology commercial sites. <http://www.intravsn.com/vendors.shtml>

9. The International Atomic Energy Agency website provides Y2K information for nuclear safety, waste management, medical facilities, and safeguards/physical protection. <http://www.iaea.org/worldatom/program/y2k>

10. The National Institute of Standards and Technology (NIST) Y2K webpage includes Y2K test programs for small businesses, free software, Y2K standards, Y2K compliance and testing, Y2K hotlines, and Y2K slide shows. <http://www.nist.gov/y2k> At the NIST website for small businesses, "The Conversion 2000: Y2K JumpStart Kit " for jump-starting a Year 2000 project is available. Also, action planning, assessment, and remediation project planning workshops are available. <http://y2khelp.nist.gov>

11. The North American Electric Reliability Council website provides information and guidance on the effect of the Year 2000 problem on the electricity supply for North America. <http://www.nerc.com>

12. The Nuclear Regulatory Commission website provides the status and findings of NRC's Y2K program which includes nuclear power plant audits, Information Notices, Generic Letters, and Y2K links. <http://www.nrc.gov/NRC/NEWS/year2000.html>

13. The President's Council on Year 2000 Conversion website has information regarding Y2K and the Federal government's efforts to prepare its computer systems, links to information on Y2K compliance for critical sectors of the economy, and other Y2K resources. In addition, the Council has established a Y2K consumer information line at 1-888-USA-4-Y2K, which provides free Y2K information to the public. <http://y2k.gov>

14. The Radiation and Health Physics website provides links to radiation detection device manufacturers and dosimetry companies. <http://www.sph.umich.edu/group/eih/UMSCHPS/commercial/>

15. The Rx2000 website is devoted to Y2K medical issues. The site has a pay section and a free section. Information found in the free section includes a provider preparedness model and comparator, Rx2000 list server and discussion forum, health care Y2K articles and publications, Rx2000 downloadable presentations, links, and health care Y2K self-help materials. <http://www.rx2000.org>

16. The Small Business Administration website provides Y2K help for small businesses. The site

includes Y2K materials, Y2K activities, and links to other sites. <http://www.sba.gov/y2k>

17. The United Kingdom Year 2000 website provides Y2K Information on software compliance. The reports are organized by manufacturer. <http://www.open.gov.uk/bug2000.htm>

18. The Department of Veterans Affairs (VA) website provides Y2K information and contingency planning for hospitals and the status of VA Y2K efforts. <http://www.va.gov>

Except for its own website, the U.S. Nuclear Regulatory Commission makes no claims regarding the accuracy of the information provided at these websites. The list of sites is provided for use by addressees as a possible source of Y2K information.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

June 25, 1999

NRC INFORMATION NOTICE 99-20:	CONTINGENCY PLANNING FOR THE YEAR 2000 COMPUTER PROBLEM

- Addressees:
- Purpose:
- Description of Circumstances:
- Discussion:

Addressees:

All material and fuel cycle licensees and certificate holders.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to encourage addresses to develop Year 2000 (Y2K) contingency plans. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid potential problems. However, suggestions contained in this IN are not NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances:

On June 14, 1999, NRC issued IN 99-18, "Update on NRC's Year 2000 Activities for Materials Licensees and Fuel Cycle Licensees and Certificate Holders," to licensees and certificate holders to update addressees regarding NRC's Y2K activities and provide sources of Y2K information. IN 99-18 provided a detailed description of the Y2K problem and addressees should refer to it for a listing of available information sources concerning Y2K issues.

The Y2K problem pertains to the potential inability of computers to correctly recognize dates beyond December 31, 1999. This problem results from computer hardware and/or software that uses two-digit fields to represent the year. These systems may misread the year 2000 and cause the systems to fail, generate faulty data, or act in an incorrect manner. The Y2K problem has the potential to interfere with the proper operation of any computer system, hardware that is microprocessor-based (embedded software), software, or database.

The Y2K problem is urgent because it has a fixed, non-negotiable deadline that is quickly approaching. This matter requires priority attention because of the limited time remaining to assess the magnitude of the problem, assess its associated risks, and implement programs that will achieve a satisfactory resolution of the Y2K problem.

Existing reporting requirements under 10 CFR Part 21 provide for notification to NRC of deficiencies, non-conformances, and failures, such as the Y2K problem, in safety-related systems.

NRC has placed a Y2K website on its homepage. The website contains information on NRC Y2K activities, Y2K information notices, and links to other webpages useful for helping licensees implement their Y2K readiness program. The NRC Y2K website address is <http://www.nrc.gov/NRC/NEWS/year2000.html>.

The International Atomic Energy Agency (IAEA) has published IAEA-TECDOC-1087, "Potential Vulnerabilities of Nuclear Fuel Cycle Facilities to the Year 2000 Issue and Measures to Address Them." This document provides helpful information for fuel cycle facilities and can be found at the IAEA Y2K website at <http://www.iaea.or.at/worldatom/program/y2k>.

Discussion:

NRC staff has several concerns associated with the potential impact of the Y2K problem on materials licensees, primarily because of the variety and types of computer systems and software in use. Licensees need to be aware of Y2K effects on health and safety, as well as regulatory requirements such as record-keeping. Although licensees are working to remediate the Y2K problem, they should be developing Y2K contingency plans. In an effort to encourage and help licensees develop Y2K contingency plans, we are providing answers to the following frequently asked questions:

Q: What is a Y2K contingency plan?

A: Y2K contingency plan is a set of procedures to deal with difficulties that might be caused directly or indirectly by a Y2K problem, or difficulties in which the severity of the problem is exacerbated by a Y2K problem. Brand new contingency plans do not have to developed for Y2K. Existing emergency procedures or disaster recovery plans can be adjusted for Y2K.

Q: Why should I worry about Y2K contingency planning?

A: Contingency planning is important for continued protection of workers, the public, and the environment, as well as to maintain business continuity. Even licensees that have remediated their systems for Y2K should consider developing Y2K contingency plans. The most extensive Y2K remediation program may not have found all Y2K problems. Y2K contingency plans will allow licensees to cope with internal Y2K problems as well as Y2K problems of business partners and external influences such as electric power, telecommunications, or water.

Q: What do I need to consider?

A: Y2K could affect licensees' internal systems such as hardware, software, embedded systems, and networks. Y2K could also affect external systems including electric power, telecommunications, and suppliers (national and international). Y2K contingency plans should consider internal risks, external risks, and possible interaction between the two.

Q: What is involved in Y2K contingency planning?

A: There are four basic phases in contingency planning: initiation, impact analysis, contingency planning, and testing.

In the initiation phase, licensees should develop a master schedule, for development of the plan, and include milestones to keep contingency planning on track. Existing disaster recovery plans or emergency procedures should be reviewed for applicability to internal and external Y2K risks. In the impact analysis phase, the Y2K internal and external risks and the effect of these risks on mission-critical and safety systems should be identified. Also, licensees should assess the potential impact of mission-critical and safety system failures on workers, the public, the environment, and business continuity.

In the contingency planning phase, the contingency plan is developed and documented. As part of this phase, the licensee determines how and when the plan will be implemented. Finally, individuals who will implement the contingency plan and fix Y2K problems as they occur should be identified.

In the testing phase, the team ensures that the contingency plan will provide adequate protection to workers, the public, and the environment, as well as ensure business continuity. Tests of the contingency plan are developed and conducted. Finally, disaster recovery plans and procedures should be updated to include the Y2K contingency plan

Q. Where can I receive help?

A. The U.S. General Accounting Office (GAO) has published a contingency planning guide, "Year 2000 Computing Crisis: Business Continuity and Contingency Planning," dated August 1998. The guide describes four phases of Y2K business contingency planning structure: initiation, business impact analysis, contingency planning, and testing. The guide can be found on the Internet at <http://www.gao.gov/y2kr.htm>.

The Department of Veterans Affairs, Veterans Health Administration, has developed a contingency planning document, "Patient-Focused Y2K Contingency Planning Guidebook." The guidebook can be found on the Internet at <http://www.va.gov>.

In an effort to provide the public with Y2K information, the President's Council on Year 2000 Conversion website has information regarding Y2K and the Federal Government's efforts to prepare its computer systems, links to information on Y2K compliance for critical sectors of the economy, and other Y2K resources. In addition, the Council has established a Y2K consumer information line at 1-888-USA-4-Y2K which provides free Y2K information. The information at this website or through the information line may useful in determining external Y2K risks and developing contingency plans.

This information notice requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contacts listed below, or the appropriate regional office.

/s/'d by

Donald A. Cool, Director
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards

Contacts: Gary Purdy, NMSS
301-415-7897
E-mail: gwp1@nrc.gov

Harry Felsher, NMSS
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Attachments: 1. List of Recently Issued NMSS Information Notices
2. List of Recently Issued NRC Information Notices

(NUDOCS Accession Number 9906220076)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

December 17, 1999

NRC INFORMATION NOTICE 99-32: THE EFFECT OF THE YEAR 2000 ISSUE ON MEDICAL LICENSEES

- Addressees:
- Purpose:
- Description of Circumstances:
- Discussion:

Addressees:

All U.S. Nuclear Regulatory Commission medical licensees.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to remind all addressees of the potential problems their computer systems and software may encounter as a result of the change to the year 2000. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid potential problems. However, suggestions contained in this information notice are not new NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances:

The Year 2000 (Y2K) problem pertains to the potential inability of computers to correctly recognize dates beyond December 31,1999. This problem results from computer hardware and/or software that uses two-digit fields to represent the year. These systems may misread the year 2000 and cause the systems to fail, generate faulty data, or act in an incorrect manner. The Y2K problem has the potential to interfere with the proper operation of any computer system, hardware that is microprocessor-based (embedded software), software, or database.

As discussed in this Information Notice (IN), "Y2K Ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000, even though the computer system or application is not Y2K Compliant. A Y2K Readiness Program is a plan for a facility to become Y2K Ready. "Y2K Compliant" is defined as a computer system or application that accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the years 1999 and 2000, and beyond, including leap-year calculations.

The Y2K problem is urgent because it has a fixed, non-negotiable deadline that is quickly approaching. This matter requires priority attention because of the limited time remaining to assess the magnitude of the problem, assess its associated risks, and implement programs that will achieve a satisfactory

resolution of the Y2K problem.

Existing reporting requirements under 10 CFR Part 21 provide for notification to NRC of deficiencies, non-conformances, and failures, such as the Y2K problem in safety-related systems

Examples of systems that may be affected by the Y2K problem include:

- Treatment planning systems
- Dose calibrators
- Embedded systems
- Decay programs
- Interlocks
- Radiation monitoring systems
- Dosimeters, dosimetry programs, and readers
- Communication systems
- Surveillance and maintenance tracking systems

To alert licensees and certificate holders to the Y2K problem, NRC issued several INs:

- IN 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996;
- IN 97-61, "U.S. Department of Health and Human Services Letter, to Medical Device Manufacturers, on the Year 2000 Problem," on August 6, 1997;
- IN 98-30, "Effect of The Year 2000 Computer Problem on NRC Licensees and Certificate Holders," on August 12, 1998;
- IN 99-18, "Update on NRC's Year 2000 Activities for Materials Licensees and Fuel Cycle Licensees and Certificate Holders," on June 14, 1999; and
- IN 99-20, "Contingency Planning for the Year 2000 Computer Problem," on June 25, 1999.

Discussion:

NRC is concerned with the effect that the Y2K computer problem may have on medical licensees. In particular we are concerned with treatment planning systems used in brachytherapy and teletherapy procedures. The Y2K problem may cause treatment planning systems to operate in an incorrect manner. For example, the treatment planning system may incorrectly calculate the activity of the source(s) used in brachytherapy or teletherapy procedure. This could cause an incorrect treatment time to be calculated and lead to a patient receiving an overdose or an underdose of radiation. Additionally, some dose calibrators have been found not to be Y2K Compliant by the manufacturer.

Addressees should contact their treatment planning system and dose calibrator vendors to determine if their systems are Y2K Ready. Further, addressees should verify that their treatment planning systems and dose calibrators are Y2K Ready. The Y2K status of some medical equipment may be found at the U.S.

Food and Drug Administration (FDA) website <http://www.fda.gov/cdrh/yr2000/year2000.html> or manufacture's website. In some cases, manufacturers have upgrades available to correct the Y2K problems for these systems, but licensees need to act to determine whether their systems have Y2K problems and obtain the upgrades.

After the transition to the year 2000, your systems should be tested for proper operation before treating a patient.

The list below contains the FDA's potentially high-risk device types that could be subject to Y2K problems. The list includes the section number in Title 21 of the U.S. Code of Federal Regulations where the generic device type is described. While all of the generic device types listed below are not subject to NRC jurisdiction, licensees should consider FDA's guidance that these radiation or radionuclide systems are potentially at risk for a Y2K problem.

892.5050* MEDICAL CHARGED-PARTICLE RADIATION THERAPY SYSTEM*
892.5300* MEDICAL NEUTRON RADIATION THERAPY SYSTEM*
892.5700* REMOTE CONTROLLED RADIONUCLIDE-APPLICATOR SYSTEM*
892.5750* RADIONUCLIDE RADIATION THERAPY SYSTEM*
892.5900* X-RAY RADIATION THERAPY SYSTEM*

FDA also has developed the MedWatch Reporting Database. FDA's MedWatch reporting requirements are stated below:

Mandatory Reports: Any device-related death or serious injury in your facility, you are required to report deaths to FDA and the manufacturer and injuries to the manufacturer only. Please report these problems through procedures established by your facility; identify the report as a Y2K problem.

Voluntary Reports: Any date-related problem that did not cause death or injury but caused unexpected performance, for example, a malfunction that could cause death or serious injury if the problem recurred. We encourage you to report any contradiction between your device findings and those findings claimed by the manufacturer. Please identify your report as a Y2K problem.

How to Report:	By telephone to 1-800-FDA-1088 By FAX, use Form 3500 to 1-800-FDA-0178 By Mail, use Form 3500, to MedWatch Food and Drug Administration, HF-2 5600 Fishers Lane Rockville, MD 20857-9787 Electronically at:<http://www.fda.gov/medwatch/index.html>

* The device classifications specified above, flagged with an asterisk, include radiation treatment planning systems that are accessories to these device types.

For additional Y2K information, visit our website at <http://www.nrc.gov/NRC/Y2K/Y2KNMSS.html>. The site contains updates of NRC's Y2K activities and provides useful links for additional Y2K information.

This information notice requires no specific action or written response. If you have any questions about

the information in this notice, please contact the technical contact listed below or the appropriate regional office.

Original signed by

Donald A. Cool, Director
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards

Contact: Gary Purdy, NMSS
(301) 415-7897
E-mail: gwp1@nrc.gov

Attachments: 1. Selected Year 2000 Web Sites
2. List of Recently Issued NMSS Information Notices
3. List of Recently Issued NRC Information Notices

(ADAMS Accession Number ML993480416)

ATTACHMENT 1

IN 99-32
December 17, 1998

SELECTED YEAR 2000 WEBSITES

1. The American Hospital Association conducted a survey of hospital Year 2000 (Y2K) readiness status. The results of the survey can found at the American Hospital Association's website. <http://www.aha.org/y2k>

2. The American Medical Association website has Y2K information for the medical community. <http://www.ama-assn.org/not-mo/y2k/index.htm>

3. The Federal Communications Commission website provides information regarding the effects of Y2K on the communications and broadcasting industry. <http://www.fcc.gov/year2000/>

4. The Food and Drug Administration has placed reports of Y2K-compliant and non-compliant medical devices on its website. The reports are organized by manufacturer. <http://www.fda.gov/cdrh/yr2000/year2000.html>

5. The General Accounting Office has placed Y2K reports on assessment, testing, and contingency planning on its website. <http://www.gao.gov/y2kr.htm>

6. The Health Care Financing Administration has placed Y2K information for health care claim repayments for Medicare, Medicaid, and Child Health Insurance Programs on its website. The site also includes the Y2K status of health care facilities, Y2K activities, and Y2K help for health care facilities. <http://www.hcfa.gov>

7. The Institution of Electrical Engineers Y2K website provides information on embedded systems. The site explains the use of Y2K risk management techniques. <http://www.iee.org.uk>

8. The intraVision website provides links to Oncology/Radiology commercial sites. <http://www.intravsn.com/vendors.shtml>

9. The International Atomic Energy Agency website provides Y2K information for nuclear safety, waste management, medical facilities, and safeguards/physical protection. <http://www.iaea.org/worldatom/program/y2k>

10. The National Institute of Standards and Technology (NIST) Y2K webpage includes Y2K test programs for small businesses, free software, Y2K standards, Y2K compliance and testing, Y2K hotlines, and Y2K slide shows. <http://www.nist.gov/y2k> At the NIST website for small businesses, "The Conversion 2000: Y2K JumpStart Kit " for jump-starting a Y2K project is available. Also, action planning, assessment, and remediation project planning workshops are available. <http://y2khelp.nist.gov>

11. The North American Electric Reliability Council website provides information and guidance on the effect of the Year 2000 problem on the electricity supply for North America. <http://www.nerc.com>

12. The U.S. Nuclear Regulatory Commission (NRC) website provides the status and findings of NRC's Y2K program which includes nuclear power plant audits, Information Notices, Generic Letters, and Y2K links. <http://www.nrc.gov/NRC/NEWS/year2000.html>

13. The President's Council on Year 2000 Conversion website has information regarding Y2K and the Federal government's efforts to prepare its computer systems, links to information on Y2K compliance for critical sectors of the economy, and other Y2K resources. In addition, the Council has established a Y2K consumer information line at 1-888-USA-4-Y2K, which provides free Y2K information to the public. <http://y2k.gov>

14. The Radiation and Health Physics website provides links to radiation detection device manufacturers and dosimetry companies. <http://www.sph.umich.edu/group/eih/UMSCHPS/commercial/>

15. The Rx2000 website is devoted to Y2K medical issues. The site has a pay section and a free section. Information found in the free section includes a provider preparedness model and comparator, Rx2000 list server and discussion forum, health care Y2K articles and publications, Rx2000 downloadable presentations, links, and health care Y2K self-help materials. <http://www.rx2000.org>

16. The Small Business Administration website provides Y2K help for small businesses. The site includes Y2K materials, Y2K activities, and links to other sites. <http://www.sba.gov/y2k>

17. The United Kingdom Year 2000 website provides Y2K Information on software compliance. The reports are organized by manufacturer. <http://www.open.gov.uk/bug2000.htm>

18. The Department of Veterans Affairs (VA) website provides Y2K information and contingency planning for hospitals and the status of VA Y2K efforts. <http://www.va.gov>

Except for its own website, the U.S. Nuclear Regulatory Commission makes no claims regarding the accuracy of the information provided at these websites. The list of sites is provided for use by addressees as a possible source of Y2K information.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555-0001

June 22, 1998

NRC GENERIC LETTER 98-03:	NMSS LICENSEES' AND CERTIFICATE HOLDERS' YEAR 2000 READINESS PROGRAMS

Addressees:

For Action:	All licensees or certificate holders for uranium hexafluoride production plants, uranium enrichment plants, and uranium fuel fabrication plants, except those that have permanently ceased operations.
For Information:	None

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this generic letter to: (1) notify all addressees of the need for Year 2000 (Y2K) Readiness Programs to address the Y2K problem in computer systems at their facilities; (2) request all action addressees to implement the actions described herein; and (3) require all action addressees to provide NRC with a written response to this letter.

Description of Circumstances:

As discussed in this Generic Letter, "Y2K Ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000, even though the computer system or application is not Y2K Compliant. A Y2K Readiness Program is a plan for a facility to become Y2K Ready. "Y2K Compliant" is defined as a computer system or application that accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the years 1999 and 2000, and beyond, including leap-year calculations.

The Y2K problem pertains to the potential inability of computers to correctly recognize dates beyond December 31,1999. This problem results from computer hardware and/or software that uses two-digit fields to represent the year. These systems may misread the year 2000 and cause the systems to fail, generate faulty data, or act in an incorrect manner. The Y2K problem has the potential to interfere with the proper operation of any computer system, hardware that is microprocessor-based (embedded software), software, or database. As a consequence, there is a risk that affected plant systems and equipment may fail to function properly.

The Y2K problem is urgent because it has a fixed, non-negotiable deadline that is quickly approaching. This matter requires priority attention because of the limited time remaining to assess the magnitude of the problem, assess its associated risks, and implement programs that will achieve a satisfactory resolution of the Y2K problem.

Existing reporting requirements under 10 CFR Part 21 provide for notification to NRC of deficiencies, non-conformances, and failures, such as the Y2K problem in safety-related systems. Examples of systems that may be affected include:

- Safeguards (Material Control and Accounting, and Physical Protection) systems

- Computer security systems
- Plant process (data scan, log, and alarm) display system computers
- Safety parameter display system computers
- Emergency response systems
- Radiation monitoring systems
- Dosimeters and readers
- Engineering programs and systems
- Communication systems
- Inventory control systems
- Surveillance and maintenance tracking systems
- Plant process control systems
- Document control systems

To alert licensees and certificate holders to the Y2K problem, NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the staff described the potential problems that computer systems and software may encounter as a result of the change from the year 1999 to the year 2000 and how the Y2K issue may affect NRC licensees and certificate holders. IN 96-70 encouraged licensees and certificate holders to examine their uses of computer systems and software well before the year 2000 and suggested that they consider appropriate actions to examine and evaluate their computer systems for Y2K vulnerabilities.

As part of NRC's response to the Y2K problem, NRC assembled a Y2K team to gather more information on the Y2K Readiness Programs of materials and fuel cycle licensees and certificate holders. In addition, materials and fuel cycle inspectors have been instructed to confirm receipt of NRC's IN 96-70, by materials and fuel cycle licensees and certificate holders; determine whether the licensees and certificate holders have identified any potential problems associated with the Y2K issue; and note any corrective actions taken by the licensees and certificate holders.

Discussion:

There are several concerns associated with the potential impact of the Y2K problem because of the variety and types of computer systems and software in use. For example, the role and use of computers and embedded systems in: (1) scheduling of maintenance and surveillance requirements; (2) programmable logic controllers and other commercial off-the-shelf software and hardware; (3) document control systems; (4) process control systems; (5) engineering calculations; and (6) systems for the collection of operating and post-accident site parameter data.

Applications that have no apparent date manipulation algorithms may still be affected by a Y2K problem. For example, a subroutine that date-stamps the header information in archival tapes, regardless of the rest of the content of the tape, may be affected. In addition, individual systems may be "date safe," but the integrated operations that the systems support may be vulnerable to the Y2K problem. Therefore, after testing a subsystem for Y2K Readiness, a functional test of the entire system should be performed.

The following elements can be used to aid in the development of a successful Y2K Readiness Program:

(1) management planning; (2) implementation; (3) quality assurance (QA); (4) regulatory considerations; and (5) documentation. The components for planning include management awareness, sponsorship, project leadership, project objectives, project management team, management plan, project reports, interfaces, resources, and oversight. The phases of implementation include: awareness; initial assessment (e.g., inventory, categorization, classification, prioritization, and analysis); detailed assessment (e.g., vendor evaluation, software evaluation, interface evaluation, remedial planning); remediation; testing and validation; and notification. The features of QA include project management QA as well as implementation QA. The aspects of regulatory considerations include the performance and documentation of appropriate reviews and/or evaluations. The elements of documentation of activities and results include project management documentation, vendor certifications, inventory lists, checklists, and record retention.

There are three reference documents that may help licensees and certificate holders with their Y2K Readiness Programs. The General Accounting Office published "Year 2000 Computing Crisis: An Assessment Guide," in September 1997 and "Year 2000 Computing Crisis: Business Continuity and Contingency Planning. Exposure Draft," in March 1998 <http://www.gao.gov/special.pubs/publist.htm> as general business tools; and the Nuclear Energy Institute published NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," in October 1997 <http://www.nrc.gov/NRC/Y2K/NRCNEI/NEI9707.html> to assist nuclear power plants in the development of their Y2K Readiness Programs. Even though the latter is geared towards commercial nuclear power plants, the general discussion of the elements in Y2K Readiness Program could be beneficial to other business entities.

NRC is also preparing its Nuclear Material Management Safeguards System (NMMSS) to be Y2K Compliant. For NRC licensees and certificate holders required to report nuclear material transactions to NMMSS, from May 1, 1998, through mid-1999, NMMSS will operate in a manner that allows all nuclear material transaction reports to NMMSS to be either in the current two-digit year reporting format or in the Y2K Compliant four-digit year format. After mid-1999, only the Y2K Compliant format will be acceptable.

Licensees and certificate holders that use their own software to input data into NMMSS will have to modify it themselves, to be Y2K compliant.

Requested Action:

Action addressees are requested to complete their Y2K Readiness Program by December 31, 1998. Action addressees' facilities are requested to be Y2K Compliant by December 31, 1999.

Required Response:

To gain the necessary assurance that action addressees are effectively resolving the Y2K problem and are in compliance with the terms and conditions of their licenses or certificates, and NRC regulations, NRC requires that all action addressees submit a written response to this Generic Letter, as follows:

(1) Within 90 days of the date of this Generic Letter, submit a written response indicating whether you have pursued and are continuing to pursue a Y2K Readiness Program. Present a brief description of the program that has already been completed, is being conducted, or is planned, to ensure Y2K Readiness of the computer systems at your facility. This response should address the program's scope, assessment process, and plans for corrective actions, including schedules for testing and validation. If an addressee chooses not to take the requested action(s), provide a description of any proposed alternative course of action, the schedule for completing the alternative course of action (if applicable), and the safety basis for determining the acceptability of the planned alternative course of action.

(2) Upon completing your Y2K Readiness Program, or, in any event, no later than December 31, 1998, submit a written response confirming that your facility is Y2K Ready and in compliance with the terms and conditions of your license or certificate, and NRC regulations; or, if your facility is not Y2K Ready by December 31, 1998, then submit a written response that contains a status report of work remaining to be done to become Y2K Ready, including completion schedules. For systems that may affect safety and safeguards, contingency plans to become Y2K Ready and Y2K Compliant should be included in your response.

(3) For facilities that are not Y2K Ready on or before December 31, 1998, submit a written response, by July 1, 1999, updating the status and schedule of your Y2K Readiness Program submitted in (2), above. The response should contain a status report of work remaining to be done to become Y2K Ready, including completion schedules. For systems that may affect safety and safeguards, contingency plans to become Y2K Ready and Y2K Compliant should be included in your response.

If you determine, as your review evolves, that your facility is not Y2K Ready after submitting information in response to this Generic Letter that states that your facility is Y2K Ready, submit a written response containing the information as requested in (3) above. The written responses should include sufficient detail to assess the licensee's or certificate holder's Y2K Readiness Program.

Address the required written responses to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act 1954, as amended. Include the docket number for the facility on the first page of any response. In addition, submit a copy to the appropriate Regional Administrator.

Backfit Discussion:

(This section is applicable only to uranium enrichment plants with certificates of compliance under 10 CFR Part 76.) This generic letter only requests information from addressees under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended. The requested information will enable NRC to verify that uranium enrichment plants are implementing effective plans to address the Y2K problem and provide for safe operation of the facilities before and after January 1, 2000, and are in compliance with the terms and conditions of their certificates, and NRC regulations. NRC regulations in 10 CFR Part 76 provide the basis for this request.

Paperwork Reduction Act Statement:

The information collections contained in this request are covered by the Office of Management and Budget clearance number 3150-0011, which expires September 9, 2000. The public reporting burden for this collection of information is estimated to average 250 hours per response, including the time for

reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0011), Office of Management and Budget, Washington, D.C. 20503.

If you have any questions about this matter, please contact one of the technical contacts listed below or the appropriate regional office.

/s/'d by

Elizabeth Q. Ten Eyck, Director
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Material Safety and Safeguard

Contacts: Gary Purdy, NMSS/IMNS
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(301) 415-5521
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Attachments: List of Recently Issued NRC Generic Letters

(NUDOCS Accession Number 9806160139)

December 11, 1997

Mr. Steve Toelle
Nuclear Regulatory Assurance
and Policy Manager
U.S. Enrichment Corporation
Two Democracy Center
Bethesda, MD 20817

Dear Mr. Toelle:

This is in followup to a telephone conversation between you and my staff on November 11, 1997, in which we indicated that we are seeking your assistance in determining the potential scope and significance of the Year 2000 problems for Nuclear Regulatory Commission materials and fuel cycle licensees. NRC's Office of Nuclear Material Safety and Safeguards is currently gathering information on the difficulty of solving the Year 2000 computer problem. As you may be aware, many computer systems may potentially fail to recognize the change to a new century. These systems may misread the year 2000 and thus may cause the systems to fail or generate faulty data. NRC is concerned that this problem has the potential to pose a threat to public health, site safety and safeguards, and worker safety.

Your responses to the enclosed questionnaire and my staff's visit to USEC on December 12, 1997, at 10:00 am, will help NRC to gather information on the Year 2000 computer problem. This information will be used to determine what future actions the NRC should take, if any, to facilitate the timely resolution of this issue. Additionally, we will identify issues and solutions that could be shared with the regulated community and government institutions to assist in addressing this problem. We would like to emphasize that the visit is not an inspection nor fee billable, but a meeting to find solutions to a problem that affects both private and government institutions. Please be advised that any responses may be subject to release under the Freedom of Information Act.

We would like to thank you for agreeing to participate in our endeavor to gather information on the Year 2000 computer problem. Your assistance will be of great benefit to the NRC's effort to understand the problem and provide valuable information to other licensees. If you have any questions, please contact Gary Purdy at (301) 415-7897 or e-mail: gwp1@nrc.gov.

Sincerely,

Donald A. Cool, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

YEAR 2000 QUESTIONNAIRE
Apply to Organization and Radiation Safety Office

1. What programmatic steps are you taking to assess the scope of the Year 2000 problem as it directly or indirectly effects your radiation safety program?
2. To whom have you assigned overall responsibility for solving the Year 2000 problem?

3. What is your schedule for completing your review of computer systems within your organization, or upon which your organization depends?
4. Identify, by title, senior management that have been involved in the resolution of the Year 2000 problem.
5. Describe the technical expertise your organization has or has access to for the identification and evaluation of the nature and extent of the Year 2000 problem. If the expertise is not available, describe your plans to obtain such expertise.
6. Describe any indentified problems to date that may effect radiation protection. Have they been solved, and if so, how? If the problems are not solved yet, what steps are you taking and when do you anticipate that they will be solved? What contingency plans have you developed for systems that may not be Year 2000 compliant?

Apply to Radiation Safety Office Only

7. List the hardware and software systems relating to radiation safety either directly or indirectly that are in use at your facility. Examples of such systems include embedded systems, treatment planning systems, dosimetry programs, microprocessors, decay programs, physical security, material control and accountability, analytical systems that rely on microprocessors and software controls, and interlocks.
8. Describe your systems testing protocol to detect Year 2000 problems. Does your testing protocol extend beyond merely considering only time- or date-related functions? If so, describe how.
9. How will you keep track of the changes that are made to solve each individual Year 2000 problem and make sure that the changes do not affect other parts of the facility?
10. List the manufacturers of systems or products relating to radiation safety and nuclear safety and safeguards systems used at your facility that you have contacted or have been contacted by. How are they addressing the problem? To what extent do you intend to rely on vendor certifications or claims of Year 2000 compliance and what is the basis (e.g., functional testing, audits, certification) for this reliance?
11. Describe your plans for changing hardware or software in any products that you provide or distribute to make them Year 2000 compliant.
12. Did you receive NRC's Information Notice 96-70, *Year 2000 Effect on Computer System Software*? The Information Notice describes an Internet list server on the Year 2000 problem. Do you subscribe to the Year 2000 list server?
13. Would you be willing to share information and details concerning problems encountered and their solutions through some sort of organized mechanism (e.g., list server described in IN 96-70)?
14. As a result of your review, are you aware of any instance in which the Year 2000 computer issue might pose a threat to public health and safety? What are your plans to correct the problem?

Return to Other Receipients | NRC Year 2000 Page | NRC Home Page

YEAR 2000 ISSUE

From the Health Physics Society's *Newsletter*
Volume XXVI, Number 1, Page 7 (January 1998)

Submitted by Cynthia Jones
NRC Senior Level Advisor for Health Physics
and *Newsletter* Correspondent

NRC's Office of Nuclear Material Safety and Safeguards is currently gathering information on the difficulty of solving the Year 2000 computer problem. As many health physicists are aware, many computer systems may potentially fail to recognize the change to a new century. These systems may misread the year 2000 and thus may cause the systems to fail or generate faulty data. NRC is concerned that this problem has the potential to pose a threat to public health, site safety & safeguards, and worker safety. In notifying licensees, two Information Notices (IN 96-70 and 97-61) have been issued to notify NRC licensees of this potential problem (both INs can be downloaded from NRC's Home Web page at www.nrc.gov).

The following questionnaire developed by NRC staff may help you & your staff gather information on potential Year 2000 computer problems. If you have any questions, or are willing to share your experiences on the Year 2000 problems with the NRC staff, please contact Gary Purdy at (301) 415-7897 or e-mail: gwp1@nrc.gov.

Questions to ask:

1. What programmatic steps are you taking to assess the scope of the Year 2000 problem as it directly or indirectly effects your radiation safety program?
2. To whom have you assigned overall responsibility for solving the Year 2000 problem?
3. What is your schedule for completing your review of computer systems within your organization, or upon which your organization depends?
4. Does your organization have, or have access to, the technical expertise needed for the identification and evaluation of the nature and extent of the Year 2000 problem at your facility? If the expertise is not available, do you plan to obtain such expertise?
5. Identify the hardware and software systems relating to radiation safety either directly or indirectly that are in use at your facility. Examples of such systems include embedded systems, treatment planning systems, dosimetry programs, microprocessors, decay programs, physical security, material control and accountability, analytical systems that rely on microprocessors and software controls, and interlocks. Describe your systems testing protocol to detect Year 2000 problems. Does your testing protocol extend beyond merely considering only time- or date-related functions?
6. How will you keep track of the changes that are made to solve each individual Year 2000 problem and make sure that the changes do not affect other parts of the facility? What contingency plans have you developed for systems that may not be Year 2000 compliant?
7. List the manufacturers of systems or products relating to radiation safety and nuclear safety and safeguards systems used at your facility that you have contacted or have been contacted by. How Are they addressing the problem? To what extent do you intend to rely on vendor certifications or claims of Year 2000 compliance and what is the basis (e.g., functional testing, audits, certification)

for this reliance?

8. Have you reviewed NRC's Information Notice 96-70, *Year 2000 Effect on Computer System Software*? The Information Notice describes an Internet list server on the Year 2000 problem. Do you subscribe to the Year 2000 list server?
9. Would you be willing to share information and details concerning problems encountered and their solutions through some sort of organized mechanism (e.g., list server described in IN 96-70)?
10. As a result of your review, are you aware of any instance in which the Year 2000 computer issue might pose a threat to public health and safety? What are your plans to correct the problem?

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Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for February 1999

I. **Overall Progress.** Provide a report of the status of agency efforts to address the Year 2000 problem, which includes an agency-wide status of the total number of mission-critical systems.

Total Number of Mission-Critical Systems	Number Compliant	Number To Be Replaced	Number To Be Repaired	Number To Be Retired
7	7	0	0	0

II. **Progress of Systems Under Repair.** Provide a report of the status of agency efforts to address the Year 2000 problem, which includes the status of systems under repair.

a. **Status of mission-critical systems being repaired.**

	Number of Mission Critical Systems	Assessment	Renovation	Validation	Implementation
Milestones		Sep 1997	Sep 1998	Jan 1999	Mar 1999*
Current Number Complete	4	4	4	4	4

b. **Provide a description of progress for fixing or replacing mission-critical systems.**
All of our mission-critical systems have been renovated, validated, and implemented in our production environments as of February 5, 1999.

c. **Provide a description of progress in fixing non-mission-critical systems.**

Our non-mission-critical systems are assigned to one of two categories in order to make explicit decisions about establishing their priority for repair:

Business-Essential Systems: Any system that is integral to agency processes that are required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while being repaired.

Non-Critical Systems: Any system that is not mission-critical or business-essential; unavailability would therefore represent only an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired, and manual processes can be readily used in their place, if necessary.

All of our business-essential and non-critical systems have been renovated, validated, and implemented in our production environment as of February 5, 1999.

d. **Provide a description of the status of efforts to inventory all data exchanges with outside entities.**
We have assessed all areas of the agency that have the potential to exchange data with other Federal, State, and local governments, as well as with international and commercial entities. Three systems were identified that exchange data with NRC. Two of these systems exchange data with one source, and one system exchanges data with six sources.

Discussions with NRC data exchange partners reveal that two exchanges are already Year 2000 (Y2K) compliant and five exchanges do not require NRC to make any changes. The final data exchange is contained in one of NRC's mission-critical systems. This system has been renovated, validated, and implemented. All our work in this area has been completed.

e. **Provide a description of efforts to address the Year 2000 problem in other areas.**

(i) Power Reactors
As discussed in previous quarterly reports, the NRC issued Generic Letter (GL) 98-01 to licensees of all operating reactors on May 11, 1998. This generic letter was sent to gain assurance that licensees are effectively addressing the Y2K problem at their facilities.

NRC has received all the initial responses from its power reactor licensees. All responses state that the licensee has pursued, and is continuing to pursue, a Y2K readiness program similar to the one outlined in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," augmented appropriately in the area of risk management, contingency planning, and remediation of embedded systems. NEI/NUSMG 97-07 recommends methods for utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license.

The Nuclear Energy Institute (NEI), in collaboration with Nuclear Utilities Software Management Group (NUSMG), issued a new guidance document, NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," in August 1998, which incorporates guidance in the areas of contingency planning, business continuity, and risk management. NRC reviewed NEI/NUSMG 98-07 and finds that it provides good guidance for augmenting Y2K readiness program in the area of contingency planning. It is expected that all nuclear power plant licensees will incorporate NEI/NUSMG 98-07 into their Y2K readiness

programs.

In September 1998, the NRC began conducting Y2K readiness sample audits at 12 nuclear power plants. These audits evaluate the effectiveness of those measures licensees are taking to identify and correct Y2K problems at their facilities. Audit reports are
The audits focused, first, on those areas of the Y2K readiness program affecting plant safety, followed by those areas important to safety (including continued plant operation). Licensee contingency planning was also reviewed during the audits. Audit findings have confirmed that licensees are implementing effective Y2K readiness programs and are on schedule to achieve readiness in accordance with GL 98-01 guidance. Audit results have not indicated a need for further NRC regulatory action, and we have no indication that significant Y2K problems exist with safety-related systems that could directly affect the ability of nuclear power plants to safely operate and shut down.

In December 1998, the NRC participated in the NEI-sponsored Y2K readiness workshop in Atlanta, Georgia at which the NRC exchanged information with nuclear power industry licensee representatives, including the results of audits completed to date. Other topics discussed at the workshop included contingency planning and system remediation methods.

In January 1999, the NRC issued a supplement to GL 98-01 that provides nuclear power plant licensees with a voluntary alternative response to the second response required by GL 98-01. This alternative response, which is also due by July 1, 1999, will provide the overall Y2K readiness status of the nuclear power plant rather than just those aspects pertaining to the terms and conditions of the license and NRC regulations. This alternative is consistent with the Year 2000 Information and Readiness Disclosure Act (Public Law No. 105-271) enacted in October 1998.

Each licensee will provide confirmation of Y2K readiness and compliance with its license with respect to the Y2K problem in July 1999 when the second response to GL

(ii) Fuel Cycle Facilities and Materials Licensee

Since November 17, 1997, materials and fuel cycle inspectors have been instructed to confirm receipt of NRC's information notices by materials and fuel cycle licensees and certificate holders; to determine whether the licensees and certificate holders have identified any potential problems associated with the Y2K issue; and to note any corrective actions taken by the licensees and certificate holders. Generic Y2K information received from inspectors will be passed on to NRC licensees. To date, no generic Y2K issues have been identified.

In June 1998, in order to gain the necessary assurance that fuel cycle licensees and certificate holders are effectively resolving the Y2K problem, the NRC issued GL 98-03. Similar to the generic letter for power reactors, GL 98-03 requires fuel cycle licensees and certificate holders to provide written information concerning the implementation of the Year 2000 Readiness Program and confirmation that facilities are Y2K ready.

All nine fuel cycle licensees and certificate holders responded to the first requirement of GL 98-03 and reported that they have established a Year 2000 Readiness Program. Six have stated that they will be Y2K ready by July 1999. Two of the licensees reported that they will be Y2K ready by October 1999. One licensee reported that it will be Y2K ready by December 1999.

On August 12, 1998, a third information notice (IN 98-30) pertaining to the Y2K computer problem was sent to material and fuel cycle licensees and certificate holders, reminding them of the Y2K problem and discussing how the Y2K problem could affect their operation.

In support of the President's Council on Year 2000 Conversion, NRC has participated in and provided information to the health care sector and the environmental protection

(iii) Contingency Planning

The NRC has developed a draft Contingency Plan that will be used to deal with unforeseen Y2K problems that may affect NRC-licensed facilities. This plan has been placed on the NRC's external Y2K Web site (http://www.nrc.gov/NRC/NEWS/year2000.html) to facilitate external stakeholder coordination and to solicit input. After external stakeholder input has been incorporated into the plan, it will be submitted to the Commission for formal approval. The NRC is also actively participating in several interagency working groups that are planning for Y2K contingencies. These groups include the Catastrophic Disaster Response Group and the President's Council Y2K Emergency Services Sector working group. The NRC plans to conduct exercises in preparation for potential Y2K problems. We anticipate that at least one of the exercise scenarios will simulate failure of mission-critical systems that support NRC's incident response capability and require implementation of NRC contingency plans for those systems.

Embedded Chips

We have analyzed and identified embedded chip systems at the NRC. Forward date testing of some embedded chip systems is problematic since access is limited to embedded chip system control programs. As a result, both the nuclear industry and the NRC rely on the manufacturer's certification to establish compliance and, where possible and appropriate, in-house testing to confirm compliance.

In the area of microcomputers and laser printers, we have successfully tested our hardware with available testing software to determine compliance. NRC has resolved all issues related to embedded systems and has replaced all microcomputers that have non-compliant chips.

In the area of local area and wide area network computer components, one of our mission-critical systems being replaced covers all of this infrastructure. We previously reported herein that this mission-critical system is now 100-percent complete.

f. **Provide a description of efforts to address the Year 2000 problem for agency buildings.**

All agency building systems were assessed. We determined that there are four building system categories that could have Y2K issues: environmental, fire protection, security access control and alarms, and elevator.

Vendors for these systems were contacted, and we received written responses from them. As of the date of this report, we have determined that continued safe operation of systems in the four categories mentioned above will not be affected by the Year 2000 date rollover.

g. **Provide a description of efforts to address the Year 2000 problem in your telecommunications systems.**

Telecommunications Equipment

NRC sent letters to its various telecommunications equipment vendors nationwide in order to determine their progress in addressing the Year 2000 problem as it relates to their products. All of the vendors have responded, been contacted by telephone, or had their Internet site accessed to determine status.

We have performed the work necessary to ensure that 100 percent of our telecommunications infrastructure is compliant or is not affected by Y2K issues.

We have also contacted our telecommunications service providers to determine their plans to achieve Y2K compliance. All of our service providers have responded that they are compliant or will be compliant by mid-1999.

h. **Provide a description of the status of the Year 2000 readiness of each government-wide system operated by the agency.**
NRC has no systems in this category.

i. **Other information demonstrating agency progress.**
No other information is offered.

j. **Efforts to ensure that Federally supported, State-run programs will be able to provide services and benefits.**
In February 1998, NRC provided information to the Agreement States (AS) to increase their awareness of the Y2K problem. Information was provided on the nature and scope of potential problems for materials licensees and the actions NRC was taking to encourage NRC materials licensees to examine their computer systems and software. NRC recommended AS encourage their licensees to conduct similar examinations. NRC also asked AS to share information with NRC on any Y2K problems identified by AS licensees that could impact NRC, other AS, or their licensees. To help facilitate AS efforts in addressing potential Y2K problems, NRC established a link to NRC Y2K information at the Office of State Programs web site. NRC also informed the AS about the availability of the NRC's list server that e-mails the latest Y2K information to each subscriber.

During the past 18 months, the Chair of the Management Review Board has also questioned AS managers about their State's Y2K activities. The AS managers have indicated that Y2K issues in their programs are being addressed as a part of statewide efforts. At this time, NRC is not aware of any Y2K issues, affecting materials licensees, identified in AS.

III. **Verification Efforts.**

Describe your independent validation and verification program.
Systems repaired by Y2K program contractors were independently verified and validated by a three-level approach. The first level, unit testing, was performed by contract personnel who actually repaired the system code. The second and third levels were performed by personnel who were not involved with system repairs. The second level of testing was performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing was performed by the NRC personnel who use the system, also using an established test plan. Only when written approval was received from all three testing levels did we consider the system validated. All annotated test plans are retained in our Y2K files, along with all written approvals.

Systems repaired by NRC program offices (and their contractors) underwent a comparable validation process. We reported these systems as validated only when the Senior Executive Service director of the responsible office certified validation in writing.

IV. **Organizational Responsibilities.**

There is no change from the previous report.

V. **Business Continuity and Contingency Plans.**

Describe your agency's approach and progress to ensure continuity of your core business functions.

NRC has an established program that predates the Y2K program and that develops, maintains, and updates the agency's business continuity plans in accordance with Federal guidance, including Office of Management and Budget (OMB) Circular A-130, Appendix III, "Security of Federal Automated Information Resources." The objective of this program is to ensure that appropriate business continuity plans are put in place for all of the NRC's general purpose systems and major applications, which include the mission-critical applications identified in our Y2K program. The process of developing the plans entails several steps:

- Conduct a business impact analysis and risk assessment.
- Develop a security plan.
- Test the security plan.
- Certify and accredit the system.
- Develop a disaster and business continuity plan.
- Train personnel and test the disaster and business continuity plan.

The Office of the Chief Information Officer uses contractor resources obtained through the General Services Administration's multiple award contract for computer security services to assist with its efforts in this area, including the conduct of facilitated risk assessments and development of plans.

By their nature, business continuity plans cover a wide range of possible events, ranging from software and hardware problems to major natural disasters. These plans also take a significant amount of time to prepare in their entirety.

Because of the immediacy of the Y2K problem, NRC has made a special effort to ensure that the contingency business continuity plans for its mission-critical systems specifically address failures resulting from the Y2K problem.

NRC's seven mission-critical systems support three core functions. One system supports the interchange of information agencywide and is our administrative local area network. Three systems support our response capability in the event of a nuclear emergency and reside in our Emergency Operations Center. The remaining three systems support the tracking and inspection of nuclear materials.

These three groups of systems are independent of each other and have no complex interrelationships with any other systems except for dependencies on the U.S. telecommunications infrastructure.

Only one of our mission-critical systems relies on electronic data provided by other automated systems, so failures of external or internal automated systems will not affect our mission-critical

systems. This mission-critical system is one of the three in our Emergency Operations Center. It receives real-time data from nuclear reactor sites in the event of a declared emergency. The Center has its own backup generator to provide power to its electronic components in the event of a power outage, as well as contingency plans dealing with the loss of any of its electronic, telecommunications, or computerized functions.

In all cases, our mission-critical systems are non-complex, stand-alone systems that support a separate area within one of our three core functions. Compared to large, complex applications dealing with millions of records and complex real-time processes, NRC's mission-critical systems are relatively simple and deal with a volume of information that is small enough to manage by manual means, if necessary, or if automation is temporarily unavailable.

Our contingency plans are commensurate with the nature of our mission-critical systems and have been prepared by the functional area business people. In all but one case, these plans have an option that assumes total automation unavailability, thus requiring that we revert to manual methods to continue support of the mission-critical functional area. These manual methods have been successfully used by our business people in the past when their systems did not exist or were temporarily unavailable. The case previously mentioned that does not assume total automation unavailability is associated with our administrative local area network (LAN). This network supports our e-mail function, common document storage, and makes administrative software (word processing, etc.) available through the LAN. However, administrative software is also present as a contingent redundancy on each workstation, so if the LAN were unavailable, necessary documents in progress can be rekeyed to continue work. New documents can be created, stored locally, and shared by floppy disk. Since the network has significant redundancy, complete unavailability of the LAN for any protracted length of time is considered very unlikely.

Our business-area people prepared these plans to ensure that we will continue to conduct mission-critical business in the event of any system failures.

VI. **Exception Report on Systems.**

There are no exceptions to report.

VII. **Systems Scheduled for Implementation After March 1999. Include a list of those mission-critical systems where repair or replacement cannot be implemented by the March 1999 deadline.**

All mission-critical systems have been implemented.

VIII. **Other Management Information.**

a. Costs (dollars in millions).

Fiscal Year	1996	1997	1998	1999	2000	Total
Current Cost	0.0*	2.4	4.0	3.9	0.0	10.3
* - Item is $45,000.						

b. Explain dramatic changes in cost.

Since we have completed our program for all systems, the resources budgeted for FY 2000 will not be needed. Therefore, we are reporting a .6M reduction in our FY 2000 budget. Also, we expect our actual expenditures for FY 1999 to be less than budgeted. We will not know the exact cost for our program until final billing is received from our Y2K contractors.

c. Changes to schedule, number of mission-critical systems, number of systems behind schedule, or number of systems scheduled to be implemented after March 1999.

There are no changes to our schedule or to the number of mission-critical systems. All mission-critical systems have been renovated, validated, and implemented.

d. Concerns with the availability of key personnel.

No concerns exist about the availability of key personnel.

e. Problems affecting progress?

No problems affecting progress exist.

If you have any questions about this report, please contact Arnold E. (Moe) Levin at (301) 415-7458 or via electronic mail at AEL1@NRC.gov.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for November 1998

I. **Overall Progress.** Provide a report of the status of agency efforts to address the Year 2000 problem, which includes an agency-wide status of the total number of mission-critical systems.

Total Number of Mission-Critical Systems	Number Compliant	Number To Be Replaced	Number To Be Repaired	Number To Be Retired
7	4	1	2	0

II. **Progress of Systems Under Repair.** Provide a report of the status of agency efforts to address the Year 2000 problem, which includes the status of systems under repair.

a. **Status of mission-critical systems being repaired.**

	Number of Mission Critical Systems	Assessment	Renovation	Validation	Implementation
Milestones		Sep 1997	Sep 1998	Jan 1999	Mar 1999
Current Number Complete	4	4	4	2	2

b. **Provide a description of progress for fixing or replacing mission-critical systems.**

We are pleased to report that 100 percent of our mission-critical and 96 percent of our business-essential renovations have been completed.

- One mission-critical system was renovated, validated, and implemented during this reporting period, and a second mission-critical system was renovated.
- Paralorts are addressing validation and implementation for our remaining two systems needing repair; the Office of Management and Budget (OMB) schedule will be met.

Work continues on the following schedule for our two remaining systems being repaired:

	Renovate	Validate	Implement
OMB Milestone Dates	**Sep 1998**	**Jan 1999**	**Mar 1999**
Emergency Response Data Sys	08/13/1998c	01/31/1999	03/04/1999
Emergency Telecom Sys	08/31/1998c	09/30/1998c	10/31/1998c
Ops Ctr Information Mgmt Sys	09/30/1998c	12/31/1998	01/01/1999

c = completed

- One mission-critical system being replaced was implemented during this reporting period. The remaining system being replaced is 96 percent complete and is on schedule for implementation on December 31, 1998.

c. Provide a description of progress in fixing non-mission-critical systems.

Our non-mission-critical systems are assigned to one of two categories in order to make explicit decisions about establishing their priority for repair:

- Business-essential Systems: Any system that is integral to agency processes that are required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while being repaired.
- Non-critical Systems: Any system that is not mission-critical or business-essential and whose unavailability would therefore represent only an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired, and manual processes can be readily used in their place, if necessary.

The following progress has been made since the last quarterly report (August 1998):

Of 51 business-essential systems--

- Thirteen systems were repaired, bringing the total to date to 49.
  - Thirteen systems reported as repaired in the last report were validated as repaired, bringing the total to date to 43.
  - Twelve systems were implemented, bringing the total to date to 39.
- Renovation continues on the two remaining business-essential systems.

The business-essential system total was reduced by 11, reflecting a decision to retire systems previously scheduled for repair.

Of 37 non-critical systems--

- Five systems were repaired, bringing the total to date to 20.
  - Five systems reported as repaired in the last report were validated as repaired, bringing the total to date to 18.
  - Four systems were implemented, bringing the total to date to 17.
- Renovation has begun on eight additional systems.
- Nine systems are scheduled for repair, but work on them has not yet begun.

The non-critical system total was reduced by 10, reflecting a decision to retire systems previously scheduled for repair.

d. Provide a description of the status of efforts to inventory all data exchanges with outside entities.

We have assessed all areas of the agency that have the potential to exchange data with other Federal, State, and local governments, as well as with international and commercial entities. Three systems were identified that exchange data with NRC. Two of these systems exchange data with one source, and one system exchanges data with six sources. Discussions with NRC data exchange partners reveal that two exchanges are already Year 2000 compliant and five exchanges do not require NRC to make any changes. The final data exchange is contained in one of NRC's mission-critical systems. This system was previously reported herein as renovated during this reporting period and is on schedule for implementation in March 1999.

e. Provide a description of efforts to address the Year 2000 problem in other areas.

Regulatory Issues.

In our last quarterly report we discussed the issuance of Generic Letter (GL) 98-01 to licensees of all operating reactors, which was sent to gain assurance that licensees are effectively addressing the Y2K problem at their facilities.

In response to the generic letter, licensees of all operating reactors are required to submit a written response as follows:

(1) Within 90 days of the date of this generic letter, submit a written response indicating whether or not you have pursued and are continuing to pursue a Y2K program similar to the one outlined in Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, augmented appropriately in the areas of risk management, contingency planning, and remediation of embedded systems. If your program significantly differs from the NEI/NUSMG guidance, present a brief description of the program(s) that have already been completed, are being conducted, or are planned to ensure Y2K readiness of the computer systems at your facility(ies). This response should address the program's scope, assessment process, plans for corrective actions (including testing and schedules), quality ssurance measures, contingency plans, and regulatory compliance.

(2) Upon completing your Y2K program or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready, or will be Y2K ready, with regard to compliance with the terms and conditions of your license(s) and NRC regulations. If your program is incomplete as of that date, your response should contain a status report, including completion schedules, of work remaining to be done to confirm your facility is/will be Y2K ready by the year 2000.

NRC has received all licensee responses to item (1) above and all the responses state that the licensee has pursued, and is continuing to pursue, a Y2K readiness program similar to the one outlined in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," augmented appropriately in the area of risk management, contingency planning, and remediation of embedded systems. NEI/NUSMG 97-07 recommends methods for utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license.

The Nuclear Energy Institute, in collaboration with the Nuclear Utilities Software Management Group, issued a new guidance document, NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," in August 1998, which incorporates guidance in the areas of contingency planning, business continuity, and risk management. NRC reviewed NEI/NUSMG 98-07 and finds that it provides good guidance for licensee use in augmenting the Y2K readiness program in the areas of contingency planning. It is expected that all nuclear power plant licensees will incorporate NEI/NUSMG 98-07 into their Y2K readiness programs.

In September 1998, the NRC started conducting Year 2000 audits at nuclear power plants. These audits are to evaluate the effectiveness of measures licensees are taking to identify and correct Y2K problems at their facilities. Audit results will be made available on the agency web site as they are issued. We have completed audits at Monticello, Seabrook, Brunswick, and Davis-Besse nuclear power plants and plan to audit additional sites before the end of January 1999.

So far, audit findings have not shown the need for further NRC regulatory action, and we have no indication that significant Y2K problems exist with safety-related systems that could directly affect the ability of nuclear power plants to safely operate and shut down. The audit will focus first on those areas of the program affecting plant safety, followed by those areas important to safety (including continued plant operation). Licensee contingency planning will be reviewed during the audits. The present schedule is to complete the audits in January 1999. On the basis of the results of the review of licensee Y2K programs from these audits, NRC will determine the need for additional generic action, particularly in the area of operational safety, beyond that already underway.

Additionally, NRC is working with NEI to conduct a Y2K workshop at which NRC will exchange information with NEI and industry representatives, including the results of the completed audits. The workshop is tentatively planned for December 1998.

Each licensee will provide confirmation of Y2K readiness and compliance with its license with respect to the Y2K problem in July 1999 when the second response to GL 98-01 is due. In accordance with GL 98-01, if the facility-specific Y2K readiness program is incomplete on July 1, 1999, the licensee response must include a status report, including completion schedules of work remaining to be done to confirm that the facility is/will be Y2K ready by the Year 2000. NRC expects to complete its review of the second GL 98-01 responses by September 1999, and any unresolved safety issues would be promptly addressed at that time.

On August 12, 1998, a third Information Notice (98-30) regarding the Year 2000 computer problem was sent to material and fuel cycle licensees and certificate holders, reminding them of the Year 2000 problem and discussing how the Y2K problem could affect their operation.

All Year 2000 related Information Notices and Generic Letters that were sent to licensees have been placed on the NRC's external Web site.

The NRC is developing a Year 2000 Contingency Plan for the agency to be prepared to respond to potential events at licensed facilities resulting from unanticipated Y2K problems. Continued safe operation of nuclear power plants during the transition to the Year 2000 is needed to help maintain reliable electrical power supplies. NRC's contingency plan will be coordinated with the nuclear industry, other Federal agencies (including the Federal Emergency Management Agency), States, and international nuclear regulatory organizations.

Embedded Chips

We have analyzed and identified embedded chip systems at the NRC. Forward date testing of some embedded chip systems is problematic since access is limited to embedded chip system control programs. As a result, both industry and NRC rely on the manufacturer's certification to establish compliance and, where possible and appropriate, in-house testing to confirm compliance.

In the area of microcomputers and laser printers, we have successfully tested our hardware with available testing software to determine compliance. NRC has a program underway to replace all microcomputers that have non-compliant chips by December 1998.

In the area of local and wide area network computer components, one of our mission-critical systems being replaced covers all of this infrastructure. We previously reported herein that this mission-critical system is now 96 percent complete.

f. Provide a description of efforts to address the Year 2000 problem for agency buildings.

All agency building systems have been assessed. We have determined that there are four building system categories that could have Year 2000 issues: Environmental, Fire Protection, Security Access Control and Alarms, and Elevator.

Vendors for these systems have been contacted and written responses have been received.

- Environmental Systems Software upgrades have recently been applied to each system by the vendor. One vendor has certified in writing that their system is now Year 2000 compliant. The certification letter from the vendor of the second system is expected soon.
- Fire Protection Systems Vendor response indicates that the safe operation of our fire protection systems will not be affected by the Year 2000 date rollover.
- Security Access Control We have received written and Alarms System certificates of Year 2000 compliance from the vendor.
- Elevator Systems We have written certification that our elevators do not operate on a date-oriented time clock and, therefore, have no Year 2000 issue.

g. Provide a description of efforts to address the Year 2000 problem in your telecommunications systems.

Telecommunications Equipment

NRC sent letters to its various telecommunications equipment vendors nationwide in order to determine their progress in addressing the Year 2000 problem as it relates to their products. All of the vendors have responded, been contacted by telephone, or had their Internet site accessed to determine status.

Responses and research indicate that 95 percent of our inventory is Year 2000 compliant or is not affected by Year 2000 issues. A small number (5 percent) have been identified as non-compliant and will be retired or replaced.

We have also contacted our telecommunications service providers to determine their plans to achieve Year 2000 compliance. All of our service providers have responded that they are compliant or will be compliant by mid-1999.

Finally, we have begun testing our telecommunications hardware in a laboratory established for that purpose. Thus far, laboratory test results have confirmed written information received from vendors.

Secure Telecommunications Equipment

We have determined that 100 percent of our secure telecommunications equipment is compliant or is not affected by Year 2000 issues.

h. Provide a description of the status of the Year 2000 readiness of each government-wide system operated by the agency.

NRC has no systems in this category.

i. Other information demonstrating agency progress.

No other information is offered.

III. **Independent Verification and Validation/Agency Oversight.**

a. Describe your independent validation and verification program.

Systems repaired by Year 2000 program contractors are being independently verified and validated by a three-level approach. The first level, unit testing, is performed by contract personnel who actually repair the system code. The second and third levels are performed by personnel who are not involved with system repairs. The second level of testing is performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing is performed by the system's NRC user. Only when written approval is received from all three testing levels do we consider the system validated and report it as such.

Systems repaired by NRC program offices (and their contractors) undergo a comparable validation process. We report these systems as validated only when the Senior Executive Service director of the responsible office has certified as such in writing.

b. Describe how your Department/Agency is organized to track progress in addressing the Year 2000 problem.

1. Describe responsible organizations for addressing the Year 2000 problem and provide an organization chart if organizations have changed from the previous report.

Arnold Levin continues as the agency's Year 2000 Program Manager. His title is "Director, Applications Development Division." Mr. Levin has day-to-day responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO has overall responsibility for the NRC's Year 2000 Program and reports to the Chairman.

2. Describe processes for assuring internal accountability of responsible organizations. Include any quantitative measures used to track performance and other methods to determine whether the responsible organizations are performing according to plan.

Internal accountability for performance of Year 2000 activities is assured through continuous monitoring of progress against established milestones. To ensure proper accountability for Year 2000 activities, we require that Senior Executive Service directors of agency offices submit monthly progress reports to the CIO on their efforts to repair or replace systems that are affected by the Year 2000 problem.

The Chief Information Officer and other senior managers meet with the Chairman daily to discuss events that have transpired in the previous 24 hours. Depending on need, the CIO mentions significant changes that have occurred in his programs, which includes the Year 2000 program.

On a more formal basis, the CIO and the Year 2000 Program Manager have briefed the Chairman on Year 2000 status, on average, every three months.

The CIO also briefs the agency Executive Council, consisting of the Executive Director for Operations, Chief Financial Officer, and Chief Information Officer every month to discuss Year 2000 issues or any other issues needing the attention of the agency's most senior managers.

Additionally, Year 2000 program staff meet with contractor management weekly to review milestones for system repairs and replacements.

Information received from reports described herein are used to update a central Year 2000 system inventory database. Reports from the database are prepared weekly to show the status of Year 2000 system repairs and replacements as measured against established milestone dates. These reports are analyzed and reviewed with the CIO every week. We are ahead of schedule in addressing Year 2000 issues.

3. Describe the management actions taken and by whom when a responsible organization falls behind schedule.

The Year 2000 Program Manager reviews progress reports on an ongoing basis and reports deviations from established schedules to the CIO. If any deviations are reported, the CIO will discuss them with managers who are responsible for the systems. As part of this discussion, the CIO will determine remedial actions to be taken. The CIO will periodically brief the Chairman, the Executive Director for Operations, and the Chief Financial Officer of the NRC on any schedule deviations and the status of remedial actions taken. No deviations have occurred to date.

IV. Continuity of Business Plans.

Describe your agency's approach to ensure continuity of your core business functions.

NRC has an established program that develops, maintains, and updates the agency's business continuity plans in accordance with Federal guidance, including OMB Circular A-130, Appendix III, "Security of Federal Automated Information Resources." The objective of this program is to ensure that appropriate business continuity plans are put in place for all of the NRC's general purpose systems and major applications, which include the mission-critical applications identified under

the Year 2000 program. The process of developing the plans entails several steps:

- Conduct a business impact analysis and risk assessment.
- Develop a security plan.
- Test the security plan.
- Certify and accredit the system.
- Develop a disaster/business continuity plan.
- Train personnel and test the disaster/business continuity plan.

The Office of the Chief Information Officer uses contractor resources, obtained through the General Services Administration's multiple award contract for computer security services, to assist with its efforts in this area, including the conduct of facilitated risk assessments and development of plans.

NRC's business continuity plans for our mission-critical systems cover a wide range of possible events, ranging from routine software and hardware problems to major natural disasters. One such event would be a software failure stemming from an undetected Year 2000 problem. NRC has made a special effort to ensure that contingency plans for its mission-critical systems contain elements that specifically address failures resulting from the Year 2000 problem.

Compared to large, complex applications dealing with millions of records and complex real-time processes, NRC's mission-critical systems are relatively simple and deal with a volume of information that is small enough to manage by manual means, if necessary or if automation is temporarily unavailable. Our contingency plans are commensurate with the nature of our mission-critical systems. We are confident that the plans we currently have in place are sufficient to address Year 2000 issues.

NRC's seven mission-critical systems support three core functions. One system supports the interchange of information agencywide and is integral to all agency operations. Three interrelated systems support our response capability in the event of a nuclear emergency. The remaining three systems support the tracking and inspection of nuclear materials. These three groups of systems are independent of each other and have no complex interrelationships with any other systems except for dependencies on the U.S. telecommunications infrastructure.

V. Exception Report on Systems.

There are no exceptions to report.

VI. Systems Scheduled for Implementation After March 1999. Include a list of those mission-critical systems where repair or replacement cannot be implemented by the March 1999 deadline.

All mission-critical systems will be implemented by the March 1999 deadline.

VII. Other Management Information.

a. Costs.

Fiscal Year	1996	1997	1998	1999	2000	Total
Current Cost	0.0*	2.4	4.0	3.9	0.6	10.9
* - Item is $45,000.						

b. Explain dramatic changes in cost.
There are no changes in cost.

c. Changes to schedule, number of mission-critical systems, number of systems behind schedule, or number of systems scheduled to be implemented after March 1999.
There are no changes to our schedule or to the number of mission-critical systems. We have no mission-critical systems scheduled for implementation after March 1999.

d. Concerns with the availability of key personnel.
No concerns exist about the availability of key personnel.

e. Problems affecting progress?
In some instances, the pace of our work depends on the schedule that commercial vendors have established for releasing either updates to existing products to bring them into Year 2000 compliance or entirely new releases that are Year 2000 compliant. We are in constant communication with these vendors in order to work with them to ensure that the products we need are available on time. The failure of these vendors to provide Year 2000 compliant products on time may adversely affect the schedule for some of our systems.

If you have any questions about this report, please contact Arnold E. (Moe) Levin at (301) 415-7458 or via electronic mail at AEL1@NRC.gov.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for August 1998

I. Overall Progress. Provide a report of the status of agency efforts to address the Year 2000 problem, which includes an agency-wide status of the total number of mission-critical systems.

Total Number of Mission-Critical Systems	Number Compliant	Number To Be Replaced	Number To Be Repaired	Number To Be Retired
7	2	2	3	0

II. Progress of Systems Under Repair. Provide a report of the status of agency efforts to address the Year 2000 problem, which includes the status of systems under repair.

a. Status of mission-critical systems being repaired.

	Number of Mission Critical Systems	Assessment	Renovation	Validation	Implementation
Milestones		Sep 1997	Sep 1998	Jan 1999	Mar 1999
Current Number Complete	4	4	2	1	1

b. Provide a description of progress for fixing or replacing mission-critical systems

- Parallel work efforts are addressing all systems still needing repair, and the Office of Management and Budget (OMB) schedule will be met.
- No deadlines for mission-critical systems being replaced were scheduled for this reporting period. Two mission-critical systems are currently being replaced. The first is now 76 percent complete and is on schedule for implementation on December 31, 1998. Coding has been completed for the second system, which is currently being tested and will be implemented by October 1998.
- One mission-critical system was renovated during this reporting period. Work continues on the following schedule for our three remaining systems being repaired:

	Renovate	Validate	Implement
OMB Milestone Dates	**Sep 1998**	**Jan 1999**	**Mar 1999**
Emergency Response Data Sys	08/13/1998c	01/31/1999	03/04/1999
Emergency Telecom Sys	08/31/1998	09/30/1998	10/31/1998
Ops Ctr Information Mgmt Sys	09/30/1998	12/31/1998	01/01/1999
c = completed			

c. Provide a description of progress in fixing non-mission-critical systems.

Our non-mission-critical systems are assigned to one of two categories in order to make explicit decisions about establishing their priority for repair:

Business-essential Systems: Any system that is integral to agency processes that are required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while being repaired.

Non-critical Systems: Any system that is not mission-critical or business-essential and whose unavailability would therefore represent only an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired and manual processes can be readily used in their place, if necessary.

The following progress has been made since the May report (May 1998):

Of 62 business-essential systems--

- Six systems were repaired, bringing the total to date to 36.
  - Of the 36 systems, 12 reported as repaired in the last report were validated in this quarter as repaired, bringing the total to date to 30.
  - Of the 36 systems, 11 were implemented, bringing the total to date to 27.
- Renovation has begun on nine additional systems, bringing the total to date to 25.
- One system is scheduled for repair, but work on it has not yet begun.

The business-essential system total was reduced by one, reflecting a decision to retire a system previously scheduled for repair.

Of 39 non-critical systems--

- One system was repaired, bringing the total to date to 15.
  - Six systems reported as repaired in the last report were validated as repaired, bringing the total to date to 13.
  - Six systems were implemented, bringing the total to date to 13.
- No new renovations were begun; five systems are currently being repaired.
- Nineteen systems are scheduled for repair, but work on them has not yet begun.

The non-critical system total was reduced by 10, reflecting a decision to retire systems previously scheduled for repair.

d. Provide a description of the status of efforts to inventory all data exchanges with outside entities.

We have assessed all areas of the agency that have the potential to exchange data with other Federal, State, and local governments, as well as with international and commercial entities. Three systems were identified that exchange data with NRC. Two of these systems exchange data with one source, and one system exchanges data with six sources.

Discussions with NRC data exchange partners reveal that two exchanges are already Year 2000 compliant and five exchanges do not require NRC to make any changes. The final data exchange is contained in one of NRC's mission-critical systems. This system was previously reported herein as renovated during this reporting period and is on schedule for implementation in March 1999.

e. Provide a description of efforts to address the Year 2000 problem in other areas.

Regulatory Issues.

On May 11, 1998, NRC issued Generic Letter (GL) 98-01 to all licensed utilities with operational nuclear power plants requiring them to inform the NRC of steps they have taken or will take to ensure that their computers have no problems adjusting to the Year 2000.

On June 22, 1998, NRC issued GL 98-03 to fuel cycle licensees and certificate holders. GL 98-03 requires addressees to provide (1) written confirmation of implementation of their Year 2000 Readiness Programs, (2) written confirmation that the facilities are Year 2000 ready and in compliance with the terms and conditions of their license or certificate and NRC regulations, and (3) updates in late 1998 and mid-1999 on implementation of their Year 2000 Readiness Programs.

NRC intends to send a third information notice regarding the Year 2000 computer problem to materials licensees reminding them of the Year 2000 problem.

Both generic letters have been placed on the NRC external Web site.

Embedded Chips.

We have analyzed and identified embedded chip systems at the NRC. Forward date testing of some embedded chip systems is problematic since access is limited to embedded chip system control programs. As a result, both industry and NRC rely on the manufacturer's certification to establish compliance and, where possible and appropriate, in-house testing to confirm compliance.

In the area of microcomputers and laser printers, we have successfully tested our hardware with available testing software to determine compliance. NRC has a program underway to replace all microcomputers that have non-compliant chips by December 1998.

In the area of local and wide area network computer components, one of our mission-critical systems being replaced covers all of this infrastructure. We previously reported herein that this mission-critical system is now 76 percent complete.

f. Provide a description of efforts to address the Year 2000 problem for agency buildings.

All agency building systems have been assessed. We have determined that there are four building system categories that could have Year 2000 issues: Environmental, Fire Protection, Security Access Control and Alarms, and Elevator.

Vendors for these systems have been contacted and written responses have been received.

- **Environmental Systems -** Vendor response indicates that these systems are not Year 2000 compliant. We continue to work with the vendor to ensure that compliance is achieved by the OMB implementation milestone date of March 1999.
- **Fire Protection Systems -** One system does not use an internal clock and , therefore, has no Year 2000 issue. The second system is not yet Year 2000 compliant; however, the vendor anticipates that a software upgrade will be available in the October 1998 time frame that will achieve compliance.
- **Security Access Control and Alarms System -** We have received written certificates of Year 2000 compliance from the vendor.
- **Elevator Systems -** We have written certification that our elevators do not operate on a date-oriented time clock and, therefore, have no Year 2000 issue.

g. Provide a description of efforts to address the Year 2000 problem in your telecommunications systems.

Telecommunications Equipment

NRC sent letters to its various telecommunications equipment vendors nationwide in order to determine their progress in addressing the Year 2000 problem as it relates to their products. All of the vendors have responded, been contacted by telephone, or had their Internet site accessed to determine status.

Responses and research indicate that 94 percent of our inventory is Year 2000 compliant or is not affected by Year 2000 issues. A small number (6 percent) have been identified as non-compliant and will be retired or replaced.

We have also contacted our telecommunications service providers to determine their plans to achieve Year 2000 compliance. All of our service providers have responded that they are compliant or will be compliant by mid-1999.

Finally, during this reporting period, NRC established a laboratory for testing telecommunications and wide area networking products and services.

Secure Telecommunications Equipment

We have determined that 100 percent of our secure telecommunications equipment is compliant or are not affected by Year 2000 issues.

Wide Area Network Telecommunications Equipment

We have contacted all of the vendors whose equipment is used in our wide area networking infrastructure. We have determined that 80 percent of this equipment is either Year 2000 compliant or is not affected by Year 2000 issues. Another 16 percent of this equipment has been determined to be non-compliant and will be replaced. We continue to actively research the remaining 4 percent to determine its status.

h. Provide a description of the status of the Year 2000 readiness of each government-wide system operated by the agency.

NRC has no systems in this category.

i. Other information demonstrating agency progress.

No other information is available.

III. Independent Verification and Validation/Agency Oversight

a. Describe your independent validation and verification program.

Systems repaired by (Year 2000 Program contractors) are being independently verified and validated by a three-level approach. The first level, unit testing, is performed by contract personnel who actually repair the system code. The second and third levels are performed by personnel who are not involved with system repairs. The second level of testing is performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing is performed by the system's NRC user. Only when written approval is received from all three testing levels do we consider the system validated and report it as such.

Systems repaired by NRC program offices (and their contractors) undergo a comparable validation process. We report these systems as validated only when the Senior Executive Service director of the responsible office has certified as such in writing.

b. Describe how your Department/Agency is organized to track progress in addressing the Year 2000 problem.

1. Describe responsible organizations for addressing the Year 2000 problem and provide an organization chart if organizations have changed from the previous report.

   Arnold Levin continues as the agency's Year 2000 Program Manager. His title is "Director, Applications Development Division." The Year 2000 Program Manager has day-to-day responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO has overall responsibility for the NRC's Year 2000 Program and reports to the Chairman.

2. Describe processes for assuring internal accountability of responsible organizations. Include any quantitative measures used to track performance and other methods to determine whether the responsible organizations are performing according to plan.

   Internal accountability for performance of Year 2000 activities is assured through continuous monitoring of progress against established milestones. To ensure proper accountability for Year 2000 activities, we require that Senior Executive Service directors of agency offices submit monthly progress reports to the CIO on their efforts to repair or replace systems that have the Year 2000 problem.

   The Chief Information Officer (CIO) and other senior managers meet with the Chairman daily to discuss events that have transpired in the last 24 hours. Depending on need, the CIO mentions significant changes that have occurred in his programs, which includes the Year 2000 program.

   On a more formal basis the CIO and the Year 2000 Program manager have briefed the Chairman on Year 2000 status, on average, every three months.

   The CIO also briefs the agency Executive Council, consisting of the Executive Director for Operations, Chief Financial Officer and the Chief Information Officer on a monthly basis to discuss Year 2000 issues or any other issues needing the attention of the most senior agency managers.

Additionally, Year 2000 Program staff meet with contractor management weekly to review milestones for system repairs and replacements. Information received from reports described herein are used to update a central Year 2000 system inventory database. Reports from the database are prepared weekly to show the status of Year 2000 system repairs and replacements as measured against established milestone dates. These reports are analyzed and reviewed with the CIO every week. To date, data indicate that we are ahead of schedule in addressing Year 2000 issues.

3. Describe the management actions taken and by whom when a responsible organization falls behind schedule.

   The Year 2000 Program Manager reviews progress reports on an ongoing basis and reports deviations from established schedules to the CIO. If any deviations are reported, the CIO will discuss them with managers who are responsible for the systems. As part of this discussion, the CIO will determine remedial actions to be taken. The CIO will periodically brief the Chairman, the Executive Director for Operations, and the Chief Financial Officer of the NRC on any schedule deviations and the status of remedial actions taken. No deviations have occurred to date.

IV. Continuity of Business Plans.

Describe your agency's approach to ensure continuity of your core business functions.

NRC has an established program that develops, maintains, and updates the agency's business continuity plans in accordance with Federal guidance, including OMB Circular A-130, Appendix III, "Security of Federal Automated Information Resources." The objective of this program is to ensure that appropriate business continuity plans are put in place for all of the NRC's general purpose systems and major applications, which include the mission-critical applications identified under the Year 2000 program. The process of developing the plans entails several steps:

- Conduct a business impact analysis and risk assessment.
- Develop a security plan.
- Test the security plan.
- Certify and accredit the system.
- Develop a disaster/business continuity plan.
- Train personnel and test the disaster/business continuity plan.

The Office of the Chief Information Officer uses contractor resources, obtained through the General Services Administration's multiple award contract for computer security services, to assist with its efforts in this area, including the conduct of facilitated risk assessments and development of plans.

NRC's business continuity plans cover a wide range of possible events, ranging from routine software and hardware problems to major natural disasters. One such event would be a software failure stemming from an undetected Year 2000 problem. NRC has made a special effort to ensure that contingency plans for its mission-critical systems contain elements that specifically address failures resulting from the Year 2000 problem.

Compared to large, complex applications dealing with millions of records and complex real-time processes, NRC mission-critical systems are relatively simple and deal with a volume of information that is small enough to manage by manual means, if necessary or if automation is temporarily unavailable. Our contingency plans are commensurate with the nature of our mission-critical systems. We are confident that the plans we currently have in place are sufficient to address Year 2000 issues.

NRC's seven mission-critical systems support three core functions. One system supports the interchange of information agencywide and is integral to all agency operations. Three interrelated systems support our response capability in the event of a nuclear emergency. The remaining three systems support the tracking and inspection of nuclear materials. These three groups of systems are independent of each other and have no complex interrelationships with any other systems except for dependencies on the U.S. telecommunications infrastructure.

V. Exception Report on Systems

There are no exceptions to report.

VI. Systems Scheduled for Implementation After March 1999. Include a list of those mission-critical systems where repair or replacement cannot be implemented by the March 1999 deadline.

All mission-critical systems will be implemented by the March 1999 deadline.

VII. Other Management Information.

a. Costs

Fiscal Year	1996	1997	1998	1999	2000	Total
Current Cost	0.0*	2.4	4.0	3.9	.6	10.9

* - Item is $45,000.

b. Explain dramatic changes in cost.

There are no changes in cost.

c. Changes to schedule, number of mission-critical systems, number of systems behind schedule, or number of systems scheduled to be implemented after March 1999.

There are no changes to our schedule or to the number of mission-critical systems. We have no mission-critical systems scheduled for implementation after March 1999.

d. Concerns with the availability of key personnel

No concerns exist about the availability of key personnel.

e. Problems affecting progress?

In some instances, the pace of our work depends on the schedule that commercial vendors have established for releasing either updates to existing products to bring them into Year 2000 compliance or entirely new releases that are Year 2000 compliant. We are in constant communication with these vendors in order to work with them to ensure that the products we need are available on time. The failure of these vendors to provide Year 2000 compliant products on time may adversely affect the schedule for some of our systems.

If you have any questions, please contact Arnold E. (Moe) Levin at 301-415-7458 or via electronic mail at AEL1@NRC.gov.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for May 1998

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1. **Organizational Responsibilities**. Describe how your Department/Agency is organized to track progress in addressing the Year 2000 problem.
   a. **Organization**. Describe responsible organizations for addressing the Year 2000 problem and provide an organization chart if organizations have changed from the previous report.
   Arnold Levin continues as the agency's Year 2000 Program Manager. His title is "Director, Applications Development Division." The Year 2000 Program Manager has day-to-day responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO has overall responsibility and reports to the Chairman.
   b. **Internal Accountability**. Describe processes for assuring internal accountability of responsible organizations. Include any quantitative measures used to track performance and other methods to determine whether the responsible organizations are performing according to plan.
   Internal accountability for performance of Year 2000 activities is assured through continuous monitoring of progress against established milestones. To assure proper accountability for Year 2000 activities, we require that Senior Executive Service directors of agency offices provide monthly progress reports to the CIO on their efforts to repair or replace systems that contain the Year 2000 problem.
   Additionally, Year 2000 Program staff meet with contractor management weekly, to review milestones for system repairs and replacements. Information received from reports described above are used to update a central Year 2000 system inventory database. Reports from the database are generated weekly to show the status of Year 2000 system repairs and replacements as measured against established milestone dates. The reports are analyzed and reviewed with the CIO every week. To date, data indicate that we are ahead of plan in addressing Year 2000 issues.
   c. **Oversight**. Describe the management actions taken and by whom, when a responsible organization falls behind schedule.
   The Year 2000 Program Manager reviews progress reports on an ongoing basis and reports deviations from established schedules to the CIO. If any deviations are reported, the CIO will discuss them with managers who are responsible for the systems. As part of this discussion, the CIO will determine remedial actions to be taken. The CIO will periodically brief the Chairman, Executive Director for Operations, and Chief Financial Officer of the NRC on any schedule deviations and status of remedial actions taken. None have occurred to date.
2. Status. Provide a report of the status of agency efforts to address the Year 2000 computer problems.
   a. An agency-wide status of the total number of mission-critical systems.

Total number of mission-critical	Number already compliant	Number being replaced	Number being repaired	Number being retired
7	2	2	3	0

b. The status of mission-critical systems being repaired.

	Assessment	Renovation	Validation	Implementation
Milestones	Sep 1997	Sep 1998	Jan 1999	Mar 1999
% Completed	100%	25%	25%	25%

b.1 The status of mission-critical systems being replaced[(1)]

	Assessment	Replacement	Validation	Implementation
Milestones	Sep 1997	Sep 1998	Jan 1999	Mar 1999
% Completed	100%	33%	33%	33%

c. **Description of Progress**. Provide a narrative description of progress, including the following elements:

(1) Status of Mission-Critical Systems.

- Parallel work efforts are addressing all systems still needing repair, and the Office of Management and Budget schedule will be met.
- Of the three mission-critical systems being replaced, one was implemented in May 1998. The second is now 64 percent complete and is on schedule for implementation on 12/31/1998. Coding is underway (and will be completed by August 1998) for the third system. It will be implemented by October 1998.
- No deadlines for mission-critical systems being repaired were scheduled for this reporting period. However, work continues on the following schedule for the three systems being repaired:

	Renovate	Validate	Implement
OMB Milestone Dates	Sep 1998	Jan 1999	Mar 1999
Emergency Response Data Sys	08/13/1998	01/31/1999	03/23/1999
Emergency Telecom Sys	08/31/1998	09/30/1998	10/31/1998
Ops Ctr Information Mgmt Sys	09/30/1998	12/31/1998	01/01/1999

(2) Status of Non-Mission Critical Systems.

Our non-mission-critical systems are assigned to one of two categories in order to make explicit decisions about establishing their priority for repair:

1. Business-essential: any system that is integral to agency processes that are required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while it is being repaired.
2. Non-critical: any system that is not mission-critical or business-essential and whose unavailability would therefore only represent an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired and manual processes can be readily used in their place if necessary.

Renovation status for these systems is as follows:

63 Business Essential Systems

30 systems have been repaired.
18 systems have been validated.
16 systems have been implemented.
23 additional systems are currently being repaired.
10 systems scheduled for repair, work not yet started.

49 Non-Critical Systems

14 systems have been repaired.
7 systems have been validated.
7 systems have been implemented.
6 additional systems are currently being repaired.
29 systems scheduled for repair, work not yet started.

The following progress has been made since the February report:

Business-Essential

- Business-essential system count was reduced by four, reflecting a decision to retire systems previously scheduled for repair
- Thirteen systems were repaired
- Five systems were validated
- Six systems were implemented
- Renovation has begun on five additional systems.

Non-Critical

- Non-critical system count was reduced by four, reflecting a decision to retire systems previously scheduled for repair
- Seven systems were repaired
- Three systems were validated
- Four systems were implemented
- Renovation has begun on an additional four systems.

(3) Data Exchanges.

We have surveyed all areas of the agency that have the potential to exchange data with other Federal, State and local governments, as well as with international and commercial entities. Three systems were identified that exchange data with NRC.

In the last report we stated that we were in contact with all of our data exchange partners to ensure that data compatibility is achieved. We subsequently found that one group of data exchange partners, for a system that has multiple data exchanges, had not been contacted. This oversight has since been rectified. It was determined that the missed data exchange was already Year 2000 compliant.

Finally, we responded to a request to provide information, through the General Services Administration, to the National Association of State Information Resource Executives (NASIRE), identifying our data exchanges with States. NRC provides data to States on State tax withholdings for employees. This data exchange is already Year 2000 compliant.

(4) Contingency Planning.

Contingency plans are in place for all seven mission-critical systems in the event that unforeseen problems are encountered.

NRC's non-mission-critical systems are organized into two categories: business-essential and non-critical. If a business-essential system falls behind schedule by 2 months or more, a contingency plan will be prepared. By our definition, non-critical systems are not mission-critical or business-essential and their unavailability would represent only a temporary inconvenience to the agency (they are low-end administrative systems). Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired, and manual processes can readily be used in their place, if necessary. Therefore, our contingency plans for these systems will be to rely on manual processes if they are not repaired in time.

(5) Other Year 2000 Implications.

NRC sent 111 letters to its various telecommunications vendors nation-wide in order to determine their progress in addressing the Year 2000 problem as it relates to their products. Most of the vendors (77%) have responded with information on about 79 percent of our telecommunications inventory.

The responses indicate that 73 percent of our inventory is Year 2000 compliant or is not affected by Year 2000 issues. A small amount (4%) has been identified as non-compliant and will be replaced. We continue to actively research the remaining 23 percent to determine status.

NRC published in the Federal Register and on the NRC Internet Web Page that its staff is proposing to send a letter to all licensed utilities with operational nuclear power plants requiring them to inform the NRC of steps they have taken or will take to ensure that their computers have no problems adjusting to the Year 2000. The letter will be sent before the end of May 1998.

Similar to its approach for commercial power reactors, NRC is developing a letter regarding the effect of the Year 2000 computer problem on fuel cycle licensees and certificate holders. The letter will require addressees to provide (1) written confirmation of implementation of their Year 2000 Readiness Programs, (2) written confirmation that the facilities are Year 2000 ready and in compliance with the terms and conditions of their license/certificate and NRC regulations, and (3) updates in late-1998 and mid-1999 on implementation of their Year 2000 Readiness Programs. Further, NRC will send a third information notice regarding the Year 2000 computer problem to materials licensees reminding them of the Year 2000 problem. Both the letter and the information notice will be placed on the NRC external Web site. We estimate that this letter will be issued at the end of May 1998.

On April 29, 1998, the Deputy Executive Director for Regulatory Programs attended a meeting of the Energy Working Group of the President's Council on Year 2000 Conversion. The purpose of the meeting was to develop an approach to ensure that the energy sector and primarily the electric power industry was effectively addressing the Year 2000 computer problem. The focus of the Council's concern in the energy sector was on ensuring the availability of the electric grid. The NRC continues to actively participate and support initiatives to address Year 2000 concerns.

NRC also has a program underway to replace all microcomputers that have non-compliant chips by December 1998.

(6) Problems Affecting Progress.

In some instances, the pace of our work depends on the schedule that commercial vendors have established for releasing either updates to existing products to bring them into Year 2000 compliance or entirely new releases that are Year 2000 compliant. We are in constant communication with these vendors in order to work with them to ensure that the products we need are available on time. The failure of these vendors to provide Year 2000 compliant products on time may adversely affect the schedule for some of our systems.

(7) Government-wide Systems.

NRC has no systems in this category.

(8) Verification Efforts.

Repaired systems are being independently verified and validated by a three-level approach. The first, unit testing, is performed by contract personnel who actually repair the system code. The second and third levels are performed by personnel who are not involved with system repairs. The second level of testing is performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing is performed by the system's NRC user. Only when written approval is received from all three testing levels do we consider the system validated and report it as validated.

(9) Other Evidence of Progress.

None.

3. **Costs.** Our costs are unchanged from our previous report.

Fiscal Year	1996	1997	1998	1999	2000	Total
Cost	0.0*	2.4	4.0	3.9	.6	10.9
* - Item is $45,000.						

4. **Exception Report on Systems.**
   No exceptions to report.
5. **Systems Scheduled for Implementation after March 1999.** Include a list of those mission-critical systems where *repair* or *replacement* cannot be implemented by the March 1999 deadline.
   All mission-critical systems can be implemented by the March 1999 deadline.

If you have any questions, please contact Arnold E. (Moe) Levin at 301-415-7458 or via electronic mail at AEL1@NRC.gov.

1. Although OMB did not request this table, we provide it to clarify system replacement status.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for February 1998

1. **Organizational Responsibilities**. Describe how your Department/Agency is organized to track progress in addressing the Year 2000 problem.
   a. **Organization**. Describe responsible organizations for addressing the Year 2000 problem and provide an organization chart if organizations have changed from the previous report.
   Arnold Levin is the agency's Year 2000 Program Manager. His title is "Director, Applications Development Division." The Year 2000 Program Manager has overall responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO reports to the Chairman.
   b. **Internal Accountability**. Describe processes for assuring internal accountability of responsible organizations. Include any quantitative measures used to track performance and other methods to determine whether the responsible organizations are performing according to plan.
   Internal accountability for performance of Year 2000 activities is assured through continuous monitoring of the progress of all offices against established milestones. To assure proper accountability for Year 2000 activities, we require that Senior Executive Service directors of agency offices provide monthly progress reports to the CIO on their efforts to repair systems that contain the Year 2000 problem. These reports are used to update a central Year 2000 inventory database. Reports from the database are generated monthly to show the status of Year 2000 efforts of each office in meeting our milestone dates. To date, progress reports received from these offices have shown progress according to plan in addressing Year 2000 issues. All facets of our Year 2000 activities are formally reviewed weekly with the CIO.
   c. **Oversight**. Describe the management actions taken and by whom, when a responsible organization falls behind schedule.
   The Year 2000 Program Manager reviews progress reports on an ongoing basis and reports deviations from established schedules to the CIO. If any such deviations are reported, the CIO will discuss them with the managers who are responsible for the systems. As part of this discussion, the CIO will determine the remedial actions to be taken. The CIO will periodically brief the Chairman, the Executive Director for Operations, and the Chief Financial Officer of the NRC on any schedule deviations and the status of any remedial actions taken. None have occurred to date.
2. **Status**. Provide a report of the status of agency efforts to address the Year 2000 computer problems.
   a. An agency-wide status of the total number of mission-critical systems.

Total number of mission-critical	Number already compliant	Number being replaced	Number being repaired	Number being retired
7	1	3	3	0

   b. The status of mission-critical systems being repaired.

	Assessment	Renovation	Validation	Implementation
Milestones	**Sep 1997**	**Sep 1998**	**Jan 1999**	**Mar 1999**
% Completed	100%	25%	25%	25%

   c. **Description of Progress**. Provide a narrative description of progress, including the following elements:
   (1) Status of Mission-Critical Systems
   - Parallel work efforts are being made to address all systems still needing repair and Office of Management and Budget milestone dates will be met.
   - Of the three mission-critical systems being replaced, 62 percent of the modules of one system are now Year 2000 compliant. Coding is underway for the other two systems and will be completed by April 1998 and August 1998, respectively.
   - No milestones for mission-critical systems were scheduled to be met during this reporting period. However, work continues on schedule according to plan.

   (2) Status of Non-Mission Critical Systems.
   Our non-mission-critical systems are assigned to one of two categories in order to make explicit decisions about establishing their priority for repair:
   1. Business-essential: any system that is integral to agency processes that are required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while it is being repaired.

2 Non-critical: any system that is not mission-critical or business-essential and whose unavailability would therefore only represent an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired and manual processes can be readily used in their place if necessary.

67 Business Essential Systems
17 systems have been renovated.
13 systems have been validated.
10 systems have been implemented.
19 additional systems are currently being repaired.
31 systems scheduled for repair, work not yet started.

53 Non-Critical Systems
7 systems have been renovated
4 systems have been validated.
3 systems have been implemented.
11 additional systems are currently being repaired.
35 systems scheduled for repair, work not yet started.

(3) Data Exchanges.

We have surveyed all areas of the agency that have the potential to exchange data with other Federal, State and local governments, as well as with international and commercial entities. Three systems were identified that exchange data with NRC. We are currently in contact with these data exchange partners to assure that data compatibility is achieved.

(4) Contingency Planning.

Contingency plans are in place for all seven mission-critical systems in the event that unforeseen problems are encountered.

NRC's non-mission-critical systems are organized into two categories: business-essential and non-critical. If a business-essential system falls behind schedule by 2 or more months, a contingency plan will be prepared. By our definition, non-critical systems are not mission-critical or business-essential and their unavailability would represent only a temporary inconvenience to the agency (they are low-end administrative systems). Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired, and manual processes can readily be used in their place, if necessary. Therefore, our contingency plans for these systems will be to rely on manual processes if they are not repaired in time.

(5) Other Year 2000 Implications.

NRC has sent more than 100 letters to its various telecommunications vendors nation-wide in order to determine their progress in addressing the Year 2000 problem.

NRC co-sponsored a workshop with the American Nuclear Society that included a session on Year 2000 computer issues.

NRC stated that it expected licensees to adopt guidance established by the Nuclear Energy Institute (NEI) and the Nuclear Utilities Software Management Group (NUSMG) for establishing a program and a schedule, and to ultimately certify Year 2000 readiness. This guidance, NEI/NUSMG 97-07, was published in the *Nuclear Utility Year 2000 Readiness Report* (October 1997).

NRC published in the Federal Register and on the NRC Internet Web Page that staff is proposing to send a letter to all licensed utilities with operational nuclear power plants requiring that they inform the NRC of steps they have taken or will take to assure their computers have no problems adjusting to the Year 2000.

NRC also has a program underway to replace all microcomputers that have non-compliant chips. Microcomputer replacement will be completed by December 1998.

(6) Problems Affecting Progress.

In some instances, the pace of our work depends on the schedule that commercial vendors have established for the release of either updates to existing products to bring them into Year 2000 compliancy or entirely new releases that are Year 2000 compliant. We are in constant communication with these vendors in order to work with them to ensure that the products we need are available on time. The failure of these vendors to provide Year 2000 compliant products on time may adversely affect the schedule for some of our systems.

(7) Government-wide Systems.

NRC has no systems in this category.

(8) Verification Efforts.

Independent verification and validation of repaired systems is being accomplished by a three-level approach. The first, unit testing, is performed by contract personnel who actually repair the system code. The second and third level are performed by personnel who are not involved with system repairs. The second level of testing is performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third level testing is performed by the system's NRC user. When written approval is received from all three testing levels, then (and only then) do we consider the system validated and report it as such.

(9) Other Evidence of Progress.
No other evidence of progress is offered.

3. Costs

We have revised the estimates for our Year 2000 program. In January 1997, we estimated that the agency would require $9.3 million to fund the Year 2000 Program through Fiscal Year 2000. This estimate covered assessing the scope of the problem, developing plans and schedules for addressing the problem, and performing repairs. The estimate at that time was based on our experience in general software maintenance activities applied to the number of systems in our inventory. Also, the estimate did not take into account the cost of performing an independent validation and verification of all system repairs. On the basis of the results of the assessment of all systems (completed in September 1997) and on actual contractor costs for repairs to date, we have developed a more realistic cost estimate.

Fiscal Year	1996	1997	1998	1999	2000	Total
Cost	0.0*	2.4	4.0	3.9	.6	10.9
* - Item is $45,000.						

4. Exception Report on Systems.
No exceptions to report.

5. Systems Scheduled for Implementation after March 1999. Include a list of those mission-critical systems where *repair* or *replacement* cannot be implemented by the March 1999 deadline.
No mission critical system is scheduled for implementation after March 1999.

If you have any questions, please contact Arnold E. (Moe) Levin at 301-415-7458 or via electronic mail at AEL1@NRC.gov.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for November 1997

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1. Organizational Responsibilities. Describe how your Department/Agency is organized to track progress in addressing the Year 2000 problem.

   a. Describe responsible organizations for addressing the Year 2000 problem and provide an organization chart if organizations have changed from the previous report.

      Subsequent to the previous report, the agency's information resources management area was reorganized. Arnold Levin is still the agency's Year 2000 Program Manager but his title is now Director, Applications Development Division. The Year 2000 Program Manager has overall responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO reports to the Chairman. A revised organization chart is attached.

   b. Describe processes for assuring internal accountability of responsible organizations. Include quantitative measures used to track performance and other methods to determine whether the responsible organizations are performing according to plan.

      Internal accountability for performance of Year 2000 activities is assured through continuous monitoring of the progress of all offices against established milestones. To assure proper accountability for Year 2000 activities, we now require the Senior Executive Service directors of agency offices involved in the remediation of Year 2000 non-compliant systems to provide progress reports to the Year 2000 Program Manager on a monthly basis. These reports are used to update a central Year 2000 Inventory System database. Reports from the database are generated monthly showing the status of Year 2000 efforts for each office in meeting our milestone dates.

   c. Describe the management actions taken and by whom, when a responsible organization falls behind schedule.

      Progress reports are reviewed on an ongoing basis by the Year 2000 Program Manager and deviations from established schedules are reported to the CIO. If any such deviations are reported, the CIO will discuss them with the managers who are responsible for the systems. As part of this discussion, the CIO will determine the remedial actions to be taken. The CIO will periodically brief the Chairman, the Executive Director for Operations, and the Chief Financial Officer of the NRC on any schedule deviations and the status of any remedial actions taken. None have occurred to date.

d. Describe how internal performance reports are verified.

Our procedures require that the head of each responsible unit submit and certify performance reports on a regular basis.

2. Status. Provide a report of the status of agency efforts to address the Year 2000 computer problems.

a. An agency-wide status of the total number of mission-critical systems.

Total Number of Mission-critical	Number Already Compliant	Number being Replaced	Number being Repaired	Number being Retired
7	0	3	4	0

b. The status of the mission-critical systems being repaired.

	Assessment	Renovation	Validation	Implementation
Milestones	Sep 1997	Dec 1998	Jan 1999	Apr 1999
% Completed	100%	25%	25%	25%

c. A brief narrative description of where significant progress has been made in addressing the problem in mission-critical systems, systems other than mission-critical systems, and problems beyond information technology systems. Also describe any significant problems affecting progress.

The following significant progress has been made since the last report:

- Assessment of all systems is complete.
- Renovation of all mission-critical systems has begun.
- Contingency plans for all mission-critical systems have been developed.
- Renovation has been completed for five non-mission-critical systems.

Significant problems affecting progress include the following:

- We are unable to precisely determine and document the status of systems that are outside agency control. This category includes systems services provided by other Government agencies and systems acquired from commercial sources. Most of the services are provided by major vendors such as AT&T, Bell Atlantic, Microsoft, IBM, and so on. We are confident that these providers will correct any Year 2000 problems in such a manner as to prevent interruption of the business functions of their customers.

3. Costs. If estimates of Year 2000 information technology costs have changed from the amounts most recently reported to OMB, report the new estimates.

NRC's cost estimates were previously provided to OMB and reported to Congress in OMB's Report *Getting Federal Computers Ready for 2000,* dated February 6, 1997. These figures will be refined, if necessary, as renovation is performed.

4. Exception Report on Systems.

No exceptions to report.

If you have any questions, please contact Arnold E. (Moe) Levin at 301-415-7458 or via electronic mail at AEL1@NRC.gov.

Attachment: As stated

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for August 1997

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1. Organizational Responsibilities. Describe how your Department/Agency is organized to track progress in addressing the Year 2000 problem.

   a. Describe responsible organizations for addressing the Year 2000 problem and provide an organization chart if organizations have changed from the previous report.

      Arnold Levin, Acting Director of the Office of Information Resources Management (IRM), is the agency's Year 2000 Program Manager. The Year 2000 Program Manager has overall responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO reports to the Chairman.

   b. Describe processes for assuring internal accountability of responsible organizations. Include quantitative measures used to track performance and other methods to determine whether the responsible organizations are performing according to plan.

      Internal accountability for performance of Year 2000 activities will be assured through continuous monitoring of the progress of all Offices against established milestones. A Year 2000 point of contact (POC) has been established for every Office within the agency. POCs will provide progress reports to the Year 2000 Program Manager on a monthly basis. These reports will be used to update a central Year 2000 Inventory System database. Reports will be generated monthly showing the status of Year 2000 efforts for each Office.

   c. Describe the management actions taken and by whom, when a responsible organization falls behind schedule

      Progress reports are reviewed on an ongoing basis by the Year 2000 Program Manager and deviations from established schedules are reported to the CIO. If any such deviations are reported, the CIO will discuss them with the managers who are responsible for the systems. As part of this discussion, the CIO will determine the remedial actions to be taken. The CIO will periodically brief the Chairman, the Executive Director for Operations, and the Chief Financial Officer of the NRC on any schedule deviations and the status of any remedial actions taken.

   d. Describe how internal performance reports are verified.

We are implementing procedures requiring that the head of each responsible unit submit and certify performance reports on a regular basis.

2. Status. Provide a report of the status of agency efforts to address the Year 2000 computer problems.

a. An agency-wide status of the total number of mission-critical systems.

Total Number of Mission-critical	Number Already Compliant	Number being Replaced	Number being Repaired	Number being Retired
7	0	3	4	0

b. The status of the mission-critical systems being repaired.

	Assessment	Renovation	Validation	Implementation
Milestones	Sep 1997	Mar 1999	Apr 1999	Nov 1999
% Completed	100%	0%	0%	0%

c. A brief narrative description of where significant progress has been made in addressing the problem in mission-critical systems, systems other than mission-critical systems, and problems beyond information technology systems. Also describe any significant problems affecting progress.

Significant progress made since last report:

- Assessment of mission-critical systems was completed 2 months ahead of our milestone for the assessment phase.
- Renovation of one mission-critical system has begun.
- Assessment of other than mission-critical systems is nearing completion.
- Renovation has begun on other than mission-critical systems.
- Replacement of commercial off-the-shelf software that is known to be Year 2000 non-compliant has begun

Significant problems affecting progress include:

- Inability to precisely determine and document the status of systems that are outside agency control. This category includes systems services provided by other Government agencies and systems acquired from commercial sources. Most of the services are provided by major vendors such as AT&T, Bell Atlantic, Microsoft, IBM, etc. We are confident that these providers will correct any Year 2000 problems in such a manner as to prevent interruption of the business functions of their customers.

3. Costs. If estimates of Year 2000 information technology costs have changed from the amounts most recently reported to OMB, report the new estimates.

NRC's cost estimates were previously provided to OMB and reported to Congress in OMB Report *Getting Federal Computers Ready for 2000*, dated February 6, 1997. These figures will be refined, if necessary, as renovation is performed.

4. Exception Report on Systems.

No exceptions to report.

If you have any questions, please contact Arnold E. (Moe) Levin at 301-415-7458 or via electronic mail at AEL1@NRC.gov.

This material is based on a presentation by
the staff of the Nuclear Regulatory Commission
during a meeting with the Nuclear Energy Institute
on October 7, 1997

UPDATING THE EMERGENCY RESPONSE DATA SYSTEM FOR THE YEAR 2000

PRESENTED BY:

JOHN R. JOLICOEUR
AEOD/IRD

OCTOBER 7, 1997

BACKGROUND

- ERDS is a near-real time data link from licensee site computers to the NRC Operations Center
- Requirements in 10CFR50 Appendix E.
- Link is licensee initiated within one hour of declaration of an Emergency Classification of Alert or higher
- Send preselected data point information at update rates between 15 and 60 seconds

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WHY IS THE DATE IMPORTANT TO ERDS?

- All intercomputer messages contain date/time fields
- Date / time information used to establish database size and indexing
- Data displays depend on correct processing of date / time information to access data
- Failure to properly handle date / time issues could cause various system problems ranging from inaccurate data storage / retrieval to total system failures associated with operating system processing errors.
- ERDS currently uses a 2 digit year field.

ERDS ACTION PLAN

- Evaluate the impact of year 2000 on the operating environment
    - Review Operating System Vendors' literature, notices, reported problems, and customer complaints
    - Focus on products like TPCWARE, DEC network products, DEC server software, cluster

software, etc.
  - Hardware products impacted?
  - Software impact on ERDS / ADACS
  - Identify testing requirements
- Perform code review of all ERDS / ADACS code
  - Contact ADACS manufacturer for already identified problems
  - Identify potential software modification requirements
  - Identify testing requirements
- Migrate the ERDS man-machine interface to R*Time/WIN version 2.x including support for 4 digit dates on all displays
- Perform all required hardware and software updates. Include modification to accept 4 digit years in the data stream
  - Ensure that the need to change licensee ERDS interface is not driven by ERDS updates, but by licensee needs.
  - Include edits to allow existing 2 digit year data streams
  - Make necessary mods to parse and validate 4 digit year data streams

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YEAR 2000 TESTING

- Testing of all ERDS data and system functions around the following dates:
  - End of year 1998
  - End of year 1999
  - February 28, 2000
  - End of year 2000
  - Daylight Savings Time adjustments in spring and fall of 2000
- Testing of licensee ERDS interfaces

SCHEDULE

- Complete all software / hardware mods - September 1998
- Complete testing and resolve all testing issues - November 1998
- Year 2000 compliant in the Operations Center - December 1998 Schedule could be accelerated by up to six months with additional funding

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CONTACTS

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U.S. Nuclear Regulatory Commission

Contingency Plan for the Year 2000 Issue in the Nuclear Industry

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  - B. MATERIALS LICENSEES
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I. INTRODUCTION

The NRC is pursuing a comprehensive program for dealing with potential Year 2000 (Y2K) issues. We have been and will continue working with our licensees to ensure that potential Y2K issues have been identified and rectified and to ensure that our own computer-based systems will continue to function properly as we pass from 1999 into 2000. However, because of the nature of the Y2K issue, it is not possible to be 100 percent certain that all potential problems will be corrected. For this reason, the NRC

established a task force to develop a contingency plan for ensuring that public health and safety and the environment will continue to be protected, even if unforeseen Y2K problems occur.

In a statement she made on June 12, 1998, to the Senate Special Committee on the Y2K technology problem, Chairman Jackson said that the NRC recognizes "the national importance of a broader focus that helps to ensure that potential concerns with electrical grid reliability are identified and resolved." To this end, the task force also explored contingency planning options for responding to regulatory and licensing issues that may result from grid reliability problems.

II. BACKGROUND

Y2K-induced events are events that arise from a date-related problem that is experienced by a software system, a software application, or a digital device at a key rollover date when the system, application, or device does not perform its intended function. December 31, 1999, to January 1, 2000, and February 28, 2000, to February 29, 2000 are examples of key rollover dates. The nuclear utility industry is engaged in Y2K readiness programs at all nuclear power plant (NPP) facilities to seek out and correct Y2K problems that have any potential to affect facility operations. Despite these efforts, there is some risk of Y2K-induced events. Effective Y2K contingency planning sets up a process for reducing such associated risks. The next section describes how the Y2K issue could affect facilities and other entities regulated by the NRC.

III. PROBLEM STATEMENT

A. REACTORS

1. Commercial Nuclear Power Plants

The electricity production and delivery systems, as two of the more important elements of the North American economic and social infrastructure, must remain dependable during the transition to Y2K. Every other critical element of infrastructure depends on the availability of an interconnected, reliable supply of electrical power. There is no doubt that cascading or even localized outages of generators and transmission facilities could have serious short- and long-term consequences. Continued safe operation of NPPs during the transition plays a major role in maintaining reliable electrical power supply systems.

To ensure continued safe operation of NPPs during the Y2K transition, the NRC is engaged in comprehensive evaluation of licensee Y2K readiness. On May 11, 1998, the NRC sent Generic Letter 98-01 to all operational NPP licensees, requiring them to take a number of steps to address potential Y2K issues at their facilities. In addition, NRC is auditing a dozen NPPs (representing a cross-section by geographic location, type of design, and age of the plant) to evaluate the effectiveness of measures those NPP licensees are taking to identify and correct Y2K issues at their facilities. NRC will use the results of these audits to determine if further regulatory action is required. By July 1, 1999, all NPP licensees must confirm in writing that their plants are or will be Y2K ready by the year 2000 with regard to compliance with the terms and conditions of their license. All licensees have responded that they are implementing programs for Y2K readiness based upon industry guidance (Reference B.1) for Y2K readiness. Industry has also prepared guidance (Reference B.2) to help NPP utilities develop Y2K contingency plans.

Internal Facility Risks

The Y2K readiness program implemented by each NPP utility is intended to identify and fix software-based items that could degrade, impair, or prevent operability of the facility. Safety-related instrumentation and control systems that perform safety function actuations do not present a Y2K issue because, in the vast majority of NPPs, these systems are analog hardwired and therefore do not rely on software that may be subject to the Y2K issue. In those few cases in which such systems are computer based, the software does not have date-driven functions that may be affected by the Y2K issue. However, there remains some risk that plants could still be subject to a Y2K-induced event that has an effect on facility operations. Examples of such internal facility risks at NPPs are computer-based control systems for feedwater control, turbine control, and generator voltage regulator control; plant process computer; control rod position information system; security computer system; and area radiation monitoring systems. Contingency plans should identify failure modes and mitigation strategies for such risks. Y2K contingency planning should also consider the potential that the Y2K issue could potentially affect many such systems and components.

External Risks

Even if the internal facility risks are small, there are still external risks to consider. External risks arise from conditions, circumstances, or events that are beyond the direct control of facility management. The task force identified electrical grid and telecommunications concerns as the significant external risk considerations; these and other concerns are discussed further in Section D.

As part of its contingency planning, the staff will attempt to identify those NPPs that may be most vulnerable to Y2K issues. Potential vulnerability will be determined on the basis of the information given in the second response to GL 98-01 and input from the Y2K program audits and other sources. Such an approach permits the staff to be better prepared to address potential Y2K problems at these particular plants in its contingency planning efforts.

2. Research and Training/Test Reactors

Research and training/test reactor licensees have also established programs to evaluate and correct Y2K deficiencies. Many research reactors will be shut down on January 1, 2000, as the institutions operating them (e.g., universities and laboratories) will be closed for the holiday. Further, these reactors often have passive safety features and low power levels, which ensure minimal potential offsite consequences. In addition, the staff concluded that any research reactor in operation on January 1, 2000, could be readily shut down manually using emergency procedures and existing shutdown systems, even if their operational systems should experience a Y2K problem.

B. MATERIALS LICENSEES

The Y2K issue may affect NRC's materials licensees in many different ways. For example, computer software that is used to calculate therapeutic dose or to account for radioactive decay may not recognize the turn of the century; this could lead to incorrectly calculated doses or exposure times for medical treatment planning. Other examples of software that may be affected are security control, radiation monitoring, technical specification surveillance testing, and accumulated burn-up programs. Also, equipment that licensees have purchased may contain computer software susceptible to the Y2K issue.

The problem could occur not only in computer software or data acquired from external sources, but also in programs developed by licensees or consultants. In an effort to inform materials licensees of the Y2K issue, NRC has issued three information notices (References A.3, A.4, and A.5) and one generic letter (Reference A.2).

1. Medical Licensees

By interviewing licensees and manufacturers, the staff found that devices containing byproduct material (high-dose-rate and teletherapy units) appear to be Y2K compliant. Manufacturers of some dose calibrators have found them not Y2K compliant; also, some treatment planning systems are not Y2K compliant. NRC is working with the U.S. Food and Drug Administration (FDA) to determine if there are any health and safety problems associated with medical devices that use byproduct material.

2. Manufacturers

NRC interviewed a large manufacturer of radiopharmaceutical products. At the time of the interview, the manufacturer did not believe that the Y2K issue would affect health and safety. The dose calibrators used at the manufacturing facility are Y2K compliant. The manufacturer believes that the Y2K issue will not affect product quality or accuracy of the measured activity.

3. Irradiators

NRC has interviewed Sterigenics, a firm that operates 12 large irradiator facilities. Sterigenics' staff believes that there are no health and safety problems related to the Y2K issue. The interlock systems and source movement for the irradiators used at its facilities are not controlled by computers. NMSS will contact a large manufacturer of irradiators for more information.

4. Fuel Cycle Facilities

NRC has conducted interviews at two fuel cycle facilities regarding the Y2K issue. All fuel cycle facilities have been inspected for Y2K concerns. The primary Y2K concern for fuel cycle facilities is diversion/theft of special nuclear material.

A generic letter (Reference A.2) was sent to fuel cycle licensees and certificate holders requesting (1) written confirmation of implementation of their Year 2000 Readiness Program; (2) written confirmation that the facilities are Y2K ready and in compliance with the terms and conditions of their license/certificate and NRC regulations; and (3) for facilities that are not Y2K ready on or before December 31, 1998, a written response updating the status and schedule of the facilities' Year 2000 Readiness Program. Every fuel facility has sent written confirmation of implementation of their Year 2000 Readiness program.

Risks for Fuel Facilities

The Y2K readiness program implemented by each fuel facility is intended to identify and repair software, hardware, and embedded systems that could degrade, impair, or prevent operability of the facility. The primary Y2K concern for fuel cycle facilities is diversion/theft of special nuclear material. However, the risk of diversion/theft of special nuclear material is highly unlikely and poses no undo safeguards risk. In the unlikely event of a complete facility blackout, the GDPs would shut down to a safe condition.

However, the restart of the GDP could pose a slight risk to employees from a uranium hexafluoride (UF_6) release. A release of UF_6 in this scenario poses no risk to members of the public. Identification of Y2K problems with fuel cycle facilities will be done after all the responses to the Generic Letter are received. There is no identified risk-significant concern for fuel cycle facilities.

Risks for Other Materials Licensees

For medical licensees, overexposure or underexposure of patients represents the greatest risk. Dose calibrators and some treatment planning systems have Y2K compliant problems. Due to the efforts of the manufacturers of dose calibrators and treatment planning systems, FDA, and the NRC, the risk to patients is considered to be low.

The risk of the Y2K issue affecting health and safety at manufacturers and irradiators facilities is low. Most of the safety systems at these facilities are not computer controlled.

If it is determined that a device has a Y2K problem that affects health and safety, NMSS will use current procedures for notifying licensees of unsafe devices. Notification will be sent directly to the affected licensees through use of the License Tracking System.

C. INTERNATIONAL

It is highly probable that Canada and Mexico will experience similar problems as described above, which could have negative effects on U.S. public health and safety, just as Y2K issues in the United States could affect Canada and Mexico. For these reasons, NRC must review existing emergency notification procedures with those countries and coordinate Y2K-related contingency plans.

D. INFRASTRUCTURE

1. Electrical Grid Concerns

External electrical grid system problems that could arise as a result of a Y2K problem are loss of offsite power, grid instability, voltage and frequency fluctuations, circuit breaker malfunctions, load fluctuations, and loss of grid control systems. The North American Electric Reliability Council released a report on September 17, 1998, that evaluated the anticipated impacts of Y2K on electrical systems (Reference C.2). The initial findings of the report conclude that proper contingency planning on the part of electric utilities should alleviate widespread power outages. However, the report also conceded that the Y2K issue would result in increased risk of isolated, local outages.

One of the major concerns raised in the NERC report is the lack of information on Y2K readiness -- about 25 percent of the electric utilities did not respond to the NERC Y2K readiness survey. However, the report also indicates that all NPP Y2K programs are on schedule to achieve Y2K ready status, largely owing to leadership from the Nuclear Energy Institute (NEI) in this area. Another major concern raised in the report is the dependency of electrical power generation, transmission, and distribution on telecommunications systems. One reason for this concern is that these telecommunication systems may be outside of the utility's control.

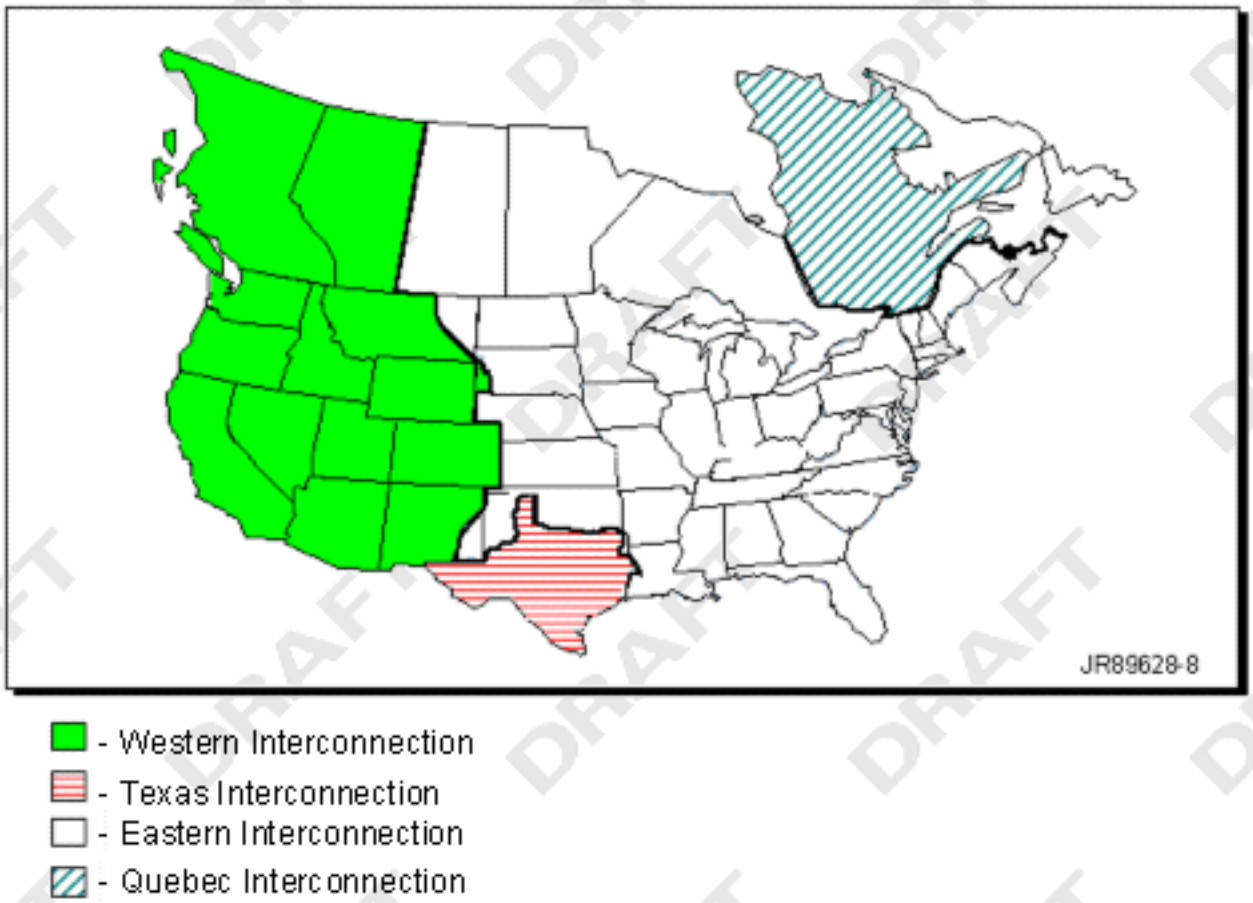

Figure 1. Electrical Grid Interconnections in North America

Interconnections

There are four large electric grid Interconnections in North America as shown in Figure 1. The largest Interconnection is the Eastern Interconnection which covers the eastern two-thirds of the United States and much of Canada. The Western Interconnection has connections into Mexico and covers the western U.S. and British Columbia and Alberta, Canada. The Quebec Interconnection (sometimes included as part of the Eastern Interconnection) covers the Canadian Province of Quebec and the Texas Interconnection covers most of Texas. The interconnections are mostly independent of each other, and are essentially ac/dc/ac inter-ties that filter out most, but not all, disturbances. A major disturbance within the interconnection has the potential to cascade to the entire interconnection. The North American Electric Reliability Council (NERC) has identified the following four critical areas that pose the greatest direct threat to power production and delivery.

Power Production

As discussed previously, power plants (including fossil and nuclear) must be able to stay online during the Y2K transition period to avoid major grid disturbances or outages. Newer plants with digital control systems may be the most vulnerable. The control and protection functions that the digital control systems perform often utilize time-dependent algorithms, which can, if uncorrected, lead to unintentional generator trips.

Energy Management Systems

Electric utility control centers monitor power system operations (including generating plants, transmission and distribution systems, and customer loads), retain historical data, and allow for the manual and automatic control of field equipment. The control center's energy management system includes supervisory control and data acquisition systems, automatic generation control systems, energy management applications and databases, and graphical user interfaces. Uncorrected Y2K issues in these systems could result in the loss of monitoring, dispatching, and control functions. In addition, many energy management systems rely on precise time signals that may be provided by global positioning system (GPS) technology. GPS has a unique and pressing problem: the clock used by this system will turn over to 0000 on August 22, 1999.

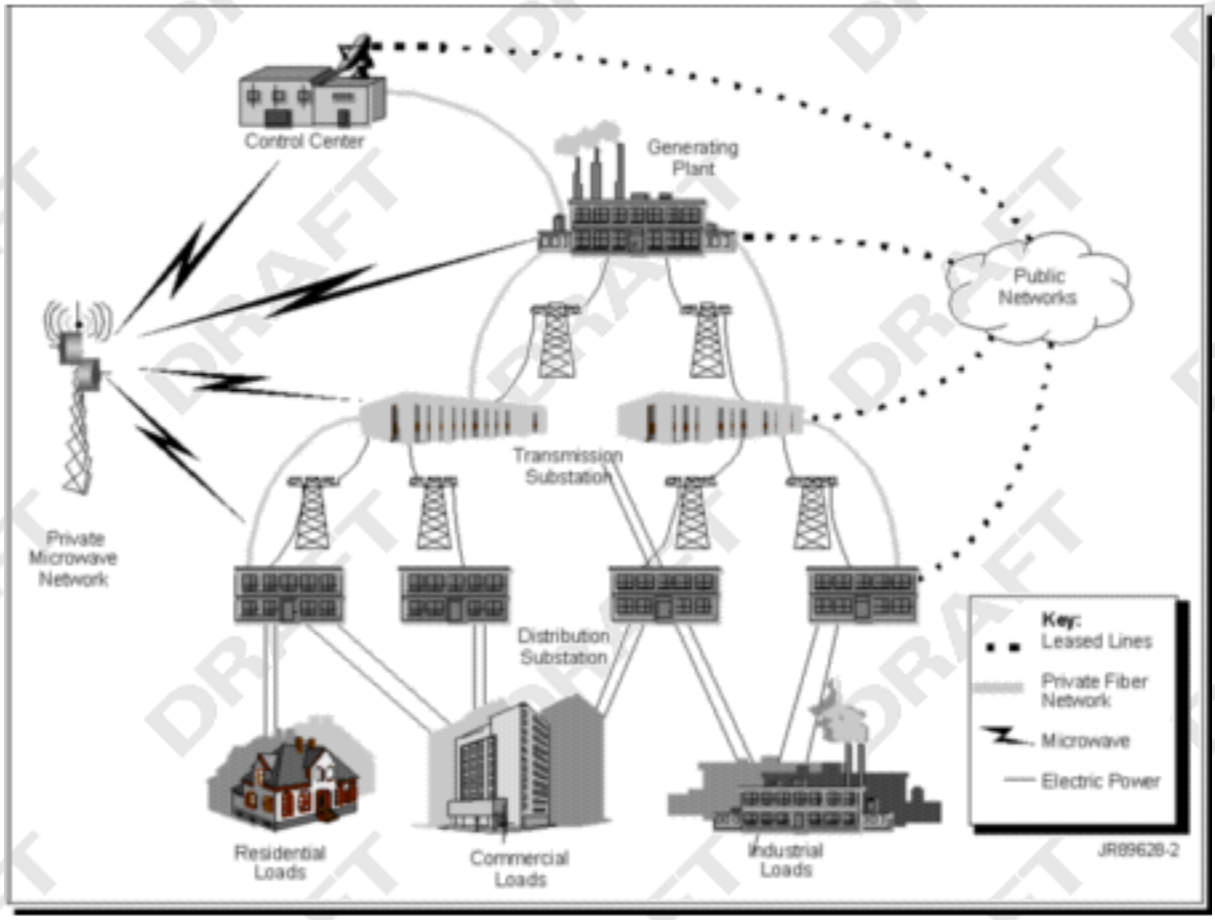

Figure 2. The Generation, Transmission, and Distribution of Electricity Requires Telecommunications Systems

Telecommunications

As shown in Figure 2, the transmission and distribution of electrical power is highly dependent on microwave, telephone, and VHF radio communications. Telecommunications systems, in turn, are highly dependent on the availability of electrical power. Section D.2 contains a discussion of how Y2K issues are being addressed by the telecommunications industry.

Protection Systems

Many newer relay protection devices are digital and are vulnerable to Y2K issues. The concern raised by NERC was the possibility of a common-mode failure in which all relays of a particular model fail at once, causing a large number of coincident outages in transmission facilities.

2. Telecommunications

As discussed previously, reliable telecommunications service is crucial to the production and delivery of power. The Regional Bell Operating Companies (RBOCs), such as Bell Atlantic and U.S. West, independent telephone companies, such as Aliant Communications, and interexchange carriers (IXCs) , such as AT&T**,** MCI Worldcom, and Sprint, have programs in place to ensure that their telephone networks will be Y2K compliant. For example, AT&T has committed approximately half a billion dollars to complete the assessment, revision, and testing of its voice, wireless, data, and government networks by December 31, 1998. Major RBOCs are participants in the National Year 2000 Telco Forum, a consortium that has contracted with Bellcore to conduct interoperability testing of data and voice networks. In addition, both IXCs and RBOCs are in a partnership with the Alliance for Telecommunications Industry Solutions (ATIS) to plan and conduct Y2K signaling interoperability tests. The testing, which is being organized by the ATIS Network Testing Committee (NTC), involves advancing the network clock and ensuring that the signaling between local exchange carriers (U.S. West, Ameritech, and GTE) and IXCs (Sprint and AT&T) is unaffected by the Y2K transition.

Although it appears that telecommunications providers are taking the necessary steps to ensure continued reliable operation of the public switched network (PSN) through the Y2K transition, the task force identified the following concerns:

- Although we know that many major telecommunications service providers are taking the necessary steps to address potential Y2K concerns, we know less information about the small local telephone companies. Many NPPs and fuel cycle facilities are located in rural areas that are serviced by small telephone companies.

- Although many utilities have corporate communication networks that tie into the PSN "downstream" of the local telephone company, some utilities appear to rely extensively on the small local telephone company. The recently enacted Year 2000 Information and Readiness Disclosure Act should help small local telephone companies get on the track of Y2K compliance.

- The PSN is so vast and complex that it is impractical to perform a rigorous quantitative reliability analysis. Despite the fact that recent studies conclude that the probability of a widespread outage is low, there have been two widespread outages within the last year caused by network signaling software problems. Both of these outages were attributed to a company that provides network signaling capability to small telephone companies.

NRC participates in a number of Government-wide emergency telecommunications initiatives. Most of these are administered through the National Communications System (NCS). An example of a technology currently in use by NRC is the Government Emergency Telecommunications System (GETS), which provides authenticated access, enhanced routing, and priority treatment in long-distance telephone networks. GETS presumes continued operation of public and Federal telephone networks during national emergencies when the volume of network traffic is expected to be very high. However, this system may not provide protection in the event of a major network outage.

NCS has been working closely with the NTC to ensure that emergency telecommunications systems are included in the internetwork Y2K testing of the PSN. The NCS is also in the initial stages of developing communication network alternatives in the event of a major PSN outage. These alternatives utilize

high-frequency radio and dedicated land lines. The NRC is exploring the option of becoming a node on the special NCS Y2K contingency network.

3. Flooding/Loss of Heat Sink

In the industry planning document (Reference B.2), loss of heat sink was identified as an external event that NPPs should consider for contingency planning purposes. This is a potential concern because systems used to control the amount of water released from a reservoir or hydroelectric dam often rely upon computers or imbedded controllers that are susceptible to the Y2K issue. Consequently, the task force examined the potential for a Y2K-induced loss of heat sink (or flooding) that could affect NRC-licensed facilities that are on rivers or flood plains. The staff has consulted with the U.S. Army Corps of Engineers (USACE) regarding this issue and has learned that, although there are potential Y2K problems that could prevent the operation of these systems, there are no identified failure mechanisms that could result in a substantial increase or decrease in the amount of water released. In addition, there is a capability to manually operate the hydroelectric plants or, if necessary, the sluice gates in a manner that ensures that minimum downstream flows are maintained. However, another factor examined by the task force was the need for reliable communication between nuclear power plant operators and the USACE. For example, in January, ice jamming on the Missouri River can result in reduced river water levels. Often when this occurs, NPP operators contact the USACE and ask them to increase downstream flows. However, because the chain of events that influences river water levels typically takes place over a number of days, this scenario would only be a concern if there were a prolonged (i.e., at least several days) telecommunication outage. Since this is highly unlikely, the task force concluded that loss of heat sink was not a significant concern for NRC contingency planning purposes.

4. Consumables

Another concern raised by the task force was the potential that certain chemicals, diesel fuel oil, water, food, and other consumables may be difficult to obtain if the Y2K transition results in a breakdown of major infrastructures. As an example of this potential, a truck en route to the Turkey Point Plant to deliver water in the aftermath of Hurricane Andrew was diverted by local law enforcement officials for another use.

IV. COORDINATION

A. INDUSTRY

In the summer of 1998, under the oversight of the Nuclear Energy Institute (NEI), the industry formed a Contingency Planning Task Force to provide NPP utilities with a "focused approach" to Y2K contingency planning. The primary product of that task force was a Y2K contingency plan guidance document entitled *NEI/NUSMG 98-07, Nuclear Utility Year 2000 Readiness Contingency Planning*, dated August 1998. This document, which builds on Y2K readiness programs already in place, presents guidance that can be used by plant operating staff to develop effective contingency plans for mitigating the potential unanticipated effects of a Y2K issue. The guidance incorporates risks to safe plant operation resulting from potential Y2K issues into the existing emergency procedures and emergency response organization at each NPP. To a large extent, Y2K issue contingency planning will be plant specific or it

will depend on the specific systems and risks identified as affected by the Y2K issue at the individual plant. However, two generic areas of consideration for contingency planning identified in NEI/NUSMG 98-07 are (1) augmentation of staff and (2) availability of consumables (e.g., emergency diesel generator fuel oil and water chemistry control chemicals).

The staff contacted NEI concerning the need for further coordination of nuclear industry Y2K contingency planning efforts. NEI indicated that it does not plan additional coordination of licensee contingency planning efforts because of the plant-specific nature of the issue. NEI stated that individual licensees will work with the NRC as necessary in accordance with their existing emergency response procedures (as they would for any unanticipated operating event) should they experience plant operability concerns due to Y2K issues. The staff has concluded that the existing emergency response capability at the nuclear facilities, supplemented to address the Y2K issue in accordance with NEI/NUSMG 98-07, provides the best approach to licensee contingency planning for this issue.

Due to the variety of operations, materials licensees have had to develop individual Y2K remediation plans. From a small sample of materials and fuel cycle licensees, it appears that larger facilities are aware of the Y2K issue and are addressing the issue. The NRC Office of the Inspector General (OIG) conducted a survey that identified a lack of Y2K awareness among radiation safety officers of Priority 3 licensees.

B. OTHER FEDERAL AGENCIES

1. NRC is a member of the Emergency Services Sector (ESS) Working Group for Y2K, which is headed by the **Federal Emergency Management Agency (FEMA)**. FEMA has been working closely with the private sector and with State and local governments to ensure that emergency services and emergency response will not be affected by the Y2K transition. The Catastrophic Disaster Response Group, which includes representatives of the 12 lead agencies of the Federal Response Plan, is working with constituent groups on issues of emergency preparedness and allocation of resources. Although the focus for the CDRG is narrower than that for the ESS Working Group, the activities are complimentary. The NRC is participating in monthly CDRG meetings on the Y2K issue. Based on a survey by FEMA of State emergency managers, most State Emergency Operation Center systems are Y2K compliant and will be available for disaster response. There is less information about the counties level of readiness, including county police and 911 centers.
2. The **Department of Energy (DOE)** is the principal Federal agency with oversight responsibility for Y2K issues in electricity supply systems. The NRC will coordinate with DOE on NRC/DOE contingency plans.
3. NRC contacted the **Federal Energy Regulatory Commission (FERC)** to find out if they were considering Y2K contingency planning related to issues or potential problems associated with electricity supply systems. FERC is not developing such plans, but is relying on DOE Y2K contingency plans to address these issues.
4. The NRC is working closely with the **National Communication System (NCS)** to ensure that emergency response communications will not be affected by the Y2K transition. NRC is exploring the option of becoming a node on the special NCS Y2K contingency network.
5. The NRC has consulted with the **U.S. Army Corps of Engineers (USACE)** concerning the

potential for Y2K failures that could affect river water levels and flows.

6. The NRC is coordinating its activities regarding the international aspects of the contingency plan with FEMA, the **Department of State**, and the **Environmental Protection Agency**.
7. The **National Interagency Fire Cache** can provide emergency telecommunications equipment support to the NRC, including HF radios and mobile satellite equipment. Use of such equipment would require advance placement at a licensed facility or placement within 24 hours after an incident.
8. The NRC has discussed the Y2K readiness of FTS2001 services with the **General Services Administration (GSA)**. GSA has assured NRC that the FTS2001 system will be Y2K compliant.
9. NRC is coordinating activities regarding medical devices that use byproduct material with the **U.S. Food and Drug Administration (FDA).**

C. STATES

To facilitate Agreement State efforts to address the Y2K issue, a link to State Government Year 2000 Websites has been provided by NRC. NRC's website identifies Y2K resources, notices, conferences, and other related information. The States have been given the Internet address of this site. The NRC will make every effort to share with the States any issue involving the Y2K issue and problems involving NRC materials licensees that may also affect Agreement States or Agreement State licensees. NRC also requested that Agreement States share any information about Agreement State materials licensees that have identified a Y2K issue that could affect NRC, other Agreement States, or their licensees.

D. INTERNATIONAL REGULATORY BODIES AND IAEA/NEA

1. Multilateral Coordination

Multilateral coordination takes place in the form of information exchange and coordination at international forums such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA). Both organizations have established programs to let IAEA member states exchange Y2K information in an effort to diagnose and remedy Y2K-related nuclear safety problems. The Office of International Programs will actively participate and monitor progress in these areas.

International Atomic Energy Agency (IAEA)

At its 1998 General Conference, the IAEA adopted a U.S.-sponsored resolution (drafted by the NRC) to make the IAEA a clearinghouse and central point of contact for IAEA member states to exchange information regarding diagnostic and remediation actions being taken at NPPs, and at fuel cycle and medical facilities that use radioactive materials, to make these facilities Y2K ready. The resolution also urges Member States to share information with the IAEA regarding diagnostic and corrective actions being planned or implemented by operating and regulatory organizations and emphasizes that Member States should have contingency plans in place at operating and regulatory organizations well before December 31, 1999, in order to handle potential problems that may arise at that time at those nuclear facilities.

In response, the IAEA has created a special project to address nuclear Y2K-related safety concerns and

contingency planning for NPPs and research reactors, and plans to hold several Y2K workshops starting in December 1998. The IAEA also recently sent a questionnaire to member states requesting information about their respective Y2K plans. The questionnaire was distributed to NRC technical offices and NRC will send the coordinated responses to the IAEA.

The U.S. is also providing a cost-free expert to the IAEA to assist in the establishment of IAEA Y2K guidelines. This expert is Morgan Libby, who co-authored the NEI paper titled "Nuclear Utility Year 2000 Readiness Contingency Planning." He will assist the IAEA on Y2K contingency planning.

Y2K issues were discussed in September 1998 at a special session of the International Conference on Topical Issues in Nuclear, Radiation, and Waste Safety which met in Vienna and at the August 1998 meeting of the VVER Regulators Group in Armenia.

At this time, NRC knows nothing about the IAEA contingency plan for the international emergency response system.

Nuclear Energy Agency (NEA)

In February 1998, the NEA sent a Y2K questionnaire to members of its Committee on Nuclear Regulatory Agencies (CNRA). A brief summary of the responses issued in May 1998 showed that all participating regulatory bodies were taking aggressive steps with licensees to identify and solve Y2K issues. In August 1998, the NEA finished its work on an international e-mail notification system, enabling CNRA members to rapidly and confidentially exchange Y2K information. The NEA plans to make the e-mail system Y2K ready by setting up redundant computer and power supply systems. The CNRA members are Belgium, Canada, Czech Republic, Finland, France, Germany, Hungary, IAEA, Japan, Netherlands, South Korea, Spain, Sweden, Switzerland, United Kingdom, and United States.

The NEA is also organizing a Y2K workshop in February 1999 (co-sponsored by the IAEA), and the NRC has proposed that regulators from the former Soviet Union and Central and Eastern Europe be invited to attend.

European Union

The European Commission sponsored a meeting of eastern/western European nuclear regulators in June 1998, at which the Y2K topic was reviewed; attendees spoke about progress in their industry.

2. Bilateral Coordination

NRC's main focus of bilateral contingency planning efforts is on Canada and Mexico. The NRC enjoys close bilateral ties with both countries and special emergency procedures are in place permitting rapid and redundant communications should an emergency arise. Contingency planning for these countries will involve, among other things, the examination of existing procedures and communications channels. It may also be necessary to coordinate with U.S. border States and Canadian and Mexican provinces.

Canada

The Atomic Energy Control Board (AECB) of Canada is addressing the Y2K issue at Canadian NPPs and hopes to have all plants Y2K compliant by June 30, 1999. Informal contacts with the AECB indicate that currently Canada has no plans to examine existing U.S.-Canadian emergency response procedures

from a Y2K perspective. NRC will formally approach the AECB to discuss multilateral and bilateral aspects of Y2K contingency planning.

Mexico

The status or existence of Y2K contingency plans in Mexico is not known at the moment. When informally approached, the Mexicans requested a formal communication, and that is being prepared.

IAEA

NRC and IAEA will coordinate contingency plans for direct NRC-IAEA communications in case of a U.S. nuclear emergency.

Other Countries

Countries with which the NRC has technical information exchange arrangements will be individually contacted by NRC regarding Y2K issues as part of the ongoing emergency preparedness information exchange. NRC will explore the possibility of using existing bilateral means of communications as redundant communications channels should the regular international emergency response system fail.

NRC will also encourage countries in earlier time zones, which will experience Y2K-related problems before the U.S. does, to relate information about Y2K issues to the NRC in the quickest possible manner to enable U.S. licensees to avoid common-cause failures. This effort will be directed mainly at Far Eastern countries, such as Japan, South Korea, and Taiwan, which operate U.S.-style reactors, but could also include certain European countries. The time difference for these countries vs. EST or PST ranges from plus 12 to 15 hours (Far East) and 6 to 9 hours (Europe). It may also be possible to coordinate this activity with FEMA if a proposal by the Chairman of the U.S. Senate Committee on the Year 2000 to set up a Y2K "early warning" system is implemented.

Federal Agencies

NRC is coordinating with the emergency response centers of all Federal agencies involved in the international nuclear emergency notification and response system, such as the Departments of State and Energy, the Environmental Protection Agency, the Federal Emergency Management Agency, the National Security Council, and the President's Council on Y2K Conversion.

3. International Safeguards and Physical Protection

The IAEA has instituted a program to examine all its safeguards systems (computers and equipment) for Y2K compliance, and plans to have all systems under its control Y2K compliant by the end of 1998. It will take longer to modify in-field equipment because much of the software was developed by outside suppliers and because some of the equipment is built in to plant processes. The IAEA is working to resolve these problems.

NRC has also asked NMSS to investigate the contingency plans of foreign countries with respect to physical protection and to raise the issue of Y2K in future visits to study physical protection.

V. CONTINGENCY PLAN

A. SCENARIO DEVELOPMENT

The task force evaluated a range of possible scenarios. At the lowest end of the spectrum is a situation in which everything goes on as usual during the transition from 1999 to 2000. At the opposite end of the spectrum the task force hypothesized a worst-case scenario involving a widespread telecommunications outage, a complete loss of the North American power grid, and several major incidents at NPPs (e.g., station blackout, loss of ultimate heat sink, loss of feedwater) in conjunction with risk-significant challenges at many other plants (e.g., loss offsite power or feedwater transients). The task force decided that the most prudent course of action was to identify a "planning scenario" that falls somewhere between the two extremes. This planning scenario would encompass events that are beyond our current best estimate of likely consequences, but that would allow the staff to respond to unforeseen possibilities. After careful consideration of the current understanding of Y2K readiness and risk, as described in Section III, the task force established the following planning assumptions:

- Y2K problems will lead to localized electrical grid disturbances and power outages within one or more interconnections. However, there will not be major regional or nationwide electric power outages.

- Local or regional telecommunications outages will occur, but there will not be a complete loss of the public switched network (PSN). Networks associated with Regional Bell Operating Companies (RBOCs), major independent telephone companies, and interexchange carriers (IXCs) will remain functional.

- At least two NRC-licensed facilities will be affected directly or indirectly by a Y2K issue that requires an NRC response (e.g., loss of offsite power).

- Y2K issues will affect at least one NPP outside of the United States.

- Unforeseen Y2K issues will place a dozen or more licensees in situations that depart from a license condition or a technical specification.

B. INCIDENT RESPONSE

Response Mode

The task force determined that the backbone of the contingency plan should be the agency's well-established and well-tested Incident Response Plan. On the basis of the planning scenario, the agency would enter Standby mode on New Year's Eve 1999. In Standby mode, the Operations Center technical teams are completely staffed and a member of the Executive Team leads the agency's response. Ordinarily, the congressional and international liaison team positions are not filled during Standby. However, as discussed below, the task force recommends not only staffing the international liaison team position, but augmenting it as well. Attachment 1 provides a timeline of when the Operations Center would be staffed for Standby.

Operations Center Readiness

The NRC Operations Center relies on three major interrelated systems to ensure the timely flow of information during an emergency: the Emergency Telecommunications System (ETS), the Emergency Response Data System (ERDS), and the Operations Center Information Management System (OCIMS). ETS is the telecommunications network that NRC relies on for voice and data communication between the NRC Operations Center and the emergency response facilities (control room, technical support center, emergency operations facility) associated with every NPP and major fuel cycle facility. ERDS is a real-time data system that allows safety-related information to be downloaded from plant computers at all commercial NPPs. OCIMS is the primary means of creating, storing, sending, and retrieving information in the Operations Center. All three of these systems are considered mission critical. The staff is very confident that by the Office of Management and Budget (OMB) implementation milestone date of March 1999, these systems will be made Y2K compliant. Nonetheless, the staff has developed Y2K contingency plans for each of these systems. The contingency plans assume that electric power, telecommunications, and building support systems are available.

Although a widespread communications outage that affected both the Regional Bell Operating Company (Bell Atlantic) and the FTS2000 network is considered extremely unlikely, the NRC is exploring the option of becoming a node on an emergency communications network being planned by the National Communication System in preparation for potential Y2K problems. This network may allow NRC to communicate with many of its licensees even if there is a regional telecommunications outage that affected the Washington, D.C. metropolitan area.

A localized outage (e.g., a problem at a central office) would be much less likely to affect NRC communications with its power plant and fuel cycle licensees. This is because the NRC's Emergency Telecommunications Systems (ETS) is designed to remain functional following a single fault or failure, barring a fire in the telephone cable room or some other common-mode failure. The trunk groups from the NRC private branch exchange (PBX) are routed to two physically separate add/drop multiplexers (ADMs) in the telephone cable room where they are added to the Synchronous Optical Network (SONET). Because SONET is "self healing" it should not be vulnerable to a single fiber cut. A limited number of Washington Interagency Telephone System (WITS) lines are also provided in the Operations Center in the event of a complete PBX failure. To provide for diversity, one of the trunks is routed to a different central office (CO) than the others. One of the trunks is dedicated to outgoing calls on the FTS2000 network. The FTS2000 network, the largest private telephone network in the world, is essentially independent of the public switched network. Currently, dedicated lines are run to each NPP site from the closest FTS2000 point of presence. However, because the direct access line (DAL) circuits are often run parallel with commercial telephone lines (and are, therefore, susceptible to common-mode failure mechanisms), an alternate means has been established to reach each NPP's control room via a microwave link through the load dispatcher.

The Operations Center also has a dedicated emergency power system, including a dedicated emergency diesel generator and several uninterruptible power supplies, and a dedicated heating, ventilation, and cooling system. The Facilities Branch within the NRC Office of Administration is working with the vendors of the support systems (environmental management and control system, tenant chilled and condenser water systems, air handling units, emergency power systems) to ensure that Y2K compliance meets the OMB-scheduled date of March 1999.

In addition, because a regional telecommunications or electric grid outage is a possibility, the staff recommends one additional contingency measure: a back-up operations center. The staff recommends that the Region IV Incident Response Center (IRC) be staffed with a small cadre of responders. Region IV was selected for several reasons:

- Region IV is the only regional office that is not in the Eastern Interconnection. A major grid outage in the Eastern Interconnection could affect Headquarters and Regions I, II, and III.

- Region IV is the only regional office that has telecommunications systems comparable to those at Headquarters. It was for this reason that the back-up to the Headquarters Automatic Notification System was placed in Region IV.

- Region IV is one time zone removed from Headquarters and may be in a better position to respond to major problems on the East Coast that affected Headquarters.

Staffing

Because NRC's response to an incident at a NPP requires a different type of expertise than an incident at a fuel cycle facility, the response procedures are oriented to a particular type of facility. For example, if an event occurs at a reactor, the Reactor Safety Team and a Protective Measures Team with specialty in reactor safety are called to the Operations Center. However, in order to respond to the Y2K planning scenario, a scaled-down multidisciplinary team of responders, as described in Attachment 1, is recommended. The total number of Headquarters responders, approximately 40, represents about half of the number who would typically participate in a full-participation exercise. It is currently envisioned that the Region IV IRC would be staffed with approximately 20 responders, which corresponds to the current number of positions in the response organization. In their backup capacity, however, they would not be expected to carry out all of the responsibilities of the headquarters team. On the other hand, if the problems encountered during the Y2K transition are more significant than anticipated in the planning scenario, then Region IV could provide additional response support. The task force also recommends that a resident inspector be on site during the Y2K transition.

Information Brokers

This specialized response team would not only respond to any Y2K-related problems at NRC-licensed facilities, but would also serve as a broker of safety-significant Y2K information that could affect our licensees. Ideally, any Y2K issues that may begin to appear in Japan, Korea, and other nations that are on the front end of the International Date Line could be communicated to NRC through IAEA. The response teams could then rapidly evaluate this information for applicability to NRC licensees and communicate this information via fax, phone, or computer (Internet). The task force also discussed the possibility that NRC could relay information related to Y2K issues experienced by facilities in the Eastern time zone, provided that licensees volunteered this information as soon as possible and did not rely on the timing and threshold established by the 10 CFR 50.72 reporting requirements. Although, it is unlikely that licensees could take corrective actions on the basis of this information (indeed, it may not be prudent to take short-term actions without thoroughly analyzing the problem), it may assist licensees in implementing contingency measures. This information-brokering activity is further discussed in the timeline provided as Attachment 2.

In developing the "early warning" scenario permitted by time zone differences, the task force made

several assumptions concerning the nature of the Y2K issue:

First, the Y2K issue is not limited to the transition that occurs at midnight, December 31, 1999. Other significant dates, including September 9, 1999 (9/9/99) and February 29, 2000 (a leap day), are discussed in Attachment 3. However, the task group concluded that the Y2K rollover is the most significant operating date. This assumption is consistent with the prioritization of transition date by groups such as the North American Electric Reliability Council.

Second, Y2K issues that originate with the midnight, December 31, 1999, rollover may not be apparent at that time. For example, a control circuit that fails to reset for any date after 1999 may not exhibit this failure until a demand is placed on this circuit. This may not occur for days, weeks, or months after the transition date. The task force assumed that the greatest probability of failure, particularly for reactor safety systems, would occur shortly (seconds, minutes, hours) after the transition date because such short processing times are involved with these systems. The general probability of failure would decrease with the passage of time, and risk factors involving simultaneous failures or failures involving infrastructure beyond the plant's control would also decrease. In any case, the task force recommends that the greatest emphasis be placed on facilities located in the time zone in which local midnight is occurring.

Third, some Y2K issues involving safety systems may show up quickly enough and clearly enough to be positively identified. This information could be passed along to units containing similar systems in sufficient time to take some positive action. The likelihood of such an event occurring and the usefulness of further distributing such information are clearly debatable. Nevertheless, the provision for early warning due to time zone differences appears to warrant consideration in agency contingency plans.

C. REGULATORY RESPONSE

As discussed in Section III, the nuclear industry is pursuing a program to identify and remediate Y2K issues that could affect facility operations. The program will incorporate effective contingency planning for reducing the risks associated with unanticipated Y2K-induced events. Despite these activities, there remains some risk that software-based systems, components, or equipment will still be subject to Y2K-induced events at key rollover dates that affect facility operations. These risks are primarily external to the plant and are of particular concern with regard to electric grid availability (loss of offsite power). If such events were to occur, to continue to operate the nuclear plant safely generating electrical power during the transitional period, the plant licensee may have to (1) take actions that depart from a license condition or a technical specification and (2) seek immediate approval from the NRC for such a departure from a license condition or technical specification. These actions may be in the best interest of maintaining public health and safety during the Y2K transition period.

The task force recognizes that the nexus between maintaining a reliable electric power grid and public health and safety is less clear and less direct than that which has traditionally been associated with NRC's statutory requirements under the Atomic Energy Act. However, because the potential impact of the Year 2000 problem is so widespread, the task force believes that failure to provide electricity to customers at this critical time may have adverse public health and safety consequences.

The potential for adverse impact on public health and safety results primarily from the fact that an unreliable grid can adversely affect NPP safety. An unreliable grid may result in a loss of offsite power at a NPP. A loss of offsite power requires NPPs to rely on their onsite sources of emergency power.

Exclusive reliance on emergency power sources increases the overall plant risk from other, possibly Y2K-related, problems at the plant. In fact, probabilistic risk assessments frequently identify the loss of both onsite and offsite ac power, referred to as station blackout, as a situation that constitutes a major portion of the total plant risk.

In addition, failure to provide the electricity to the grid may also have an impact on public health and safety in a broader sense. For example, in mid-July 1995, a heat wave struck the upper Midwest and contributed to a number of fatalities in the Milwaukee and Chicago areas. Many of the fatalities were directly attributed to the heat, and involved people without access to air conditioning. A loss of the grid during this period would have likely resulted in an increased number of fatalities. In situations like this, grid reliability has a direct relationship to public health and safety.

In an effort to help ensure reliable power to the electric grid during the transitional period of the Y2K rollover date, as an important aspect of the protection of public health and safety in the broader sense discussed above, the task force recommends the following:

- Licensees may invoke 10 CFR 50.54(x) to maintain continued plant operation, providing the licensee determines that no significant safety concern results during a Y2K transition period of several days beginning on January 1, 2000.

  - or -

- The staff may provide a revised enforcement discretion policy specific to the Y2K transition period with specific guidance on those circumstances under which continued plant operation would be permitted and no significant safety concern results.

- The NRC will provide support staff consisting of projects and enforcement personnel in the Operations Center to assist licensees in making prompt operability determinations during this transition period.

The NRC has determined that if the agency were to address Y2K issues affecting plant operability within the existing regulatory framework and procedures, continued safe operation of the facility could be unnecessarily adversely impacted, thereby potentially resulting in adverse impact on public health and safety by forcing an unnecessary plant shutdown. NRC approval for relief from a technical specification or license condition under current practices for notification of enforcement discretion would be too cumbersome and unworkable given the desire for prompt action if the licensee determines that continued safe plant operation is possible.

The above options are currently under review and a final determination on the appropriate approach to address this issue will be made after consideration of stakeholder input.

VI. REFERENCES

A. GENERIC COMMUNICATIONS

1. May 11, 1998 - NRC Generic Letter 98-01: Year 2000 Readiness of Computer Systems at Nuclear Power Plants.
2. June 22, 1998 - NRC Generic Letter 98-03: NMSS Licensees' and Certificate Holders' Year 2000

Readiness Programs.

3. December 24, 1996 - NRC Information Notice 96-70: Year 2000 Effect on Computer System Software.
4. August 6, 1997 - NRC Information Notice 97-61: U.S. Department of Health and Human Services Letter to Medical Device Manufacturers on the Year 2000 Problem.
5. August 12, 1998 - NRC Information Notice 98-30: Effect of the Year 2000 Computer Problem on Material and Fuel Cycle Licensees and Certificate Holders.

B. INDUSTRY GUIDANCE DOCUMENTS

1. October 1997 - Nuclear Energy Institute and Nuclear Utilities Software Management Group Report NEI/NUSMG 97-07: Nuclear Utility Year 2000 Readiness
2. August 1998 - Nuclear Energy Institute and Nuclear Utilities Software Management Group Report NEI/NUSMG 98-07: Nuclear Utility Year 2000 Readiness Contingency Planning.

C. OTHER RELEVANT DOCUMENTS

1. March 1997 - National Security Telecommunications Advisory Committee, Information Assurance Task Force: Electric Power Risk Assessment.
2. September 17, 1998 - North American Electric Reliability Council: Preparing the Electric Power Systems of North America for Transition to the Year 2000, A Status Report and Work Plan.
3. August 13, 1998 - Nuclear Regulatory Commission: Year 2000 Readiness Audit Plan (for NRC staff review of select nuclear power plants).
4. September 8, 1998 - North American Electric Reliability Council: Year 2000 Contingency Planning and Preparations Guide (Draft).
5. September 1997 - U.S. General Accounting Office (GAO): GAO/AIMD-10.1.14, "Year 2000 Computing Crisis: An Assessment Guide."
6. August 1998 - U.S. General Accounting Office (GAO): GAO/AIMD-10.1.19, "Year 2000 Computing Crisis: Business Continuity and Contingency Planning."

HEADQUARTERS MULTIDISCIPLINARY TEAM OF RESPONDERS

Executive Team Member (Lead overall response effort)

ET Chronology Officer
Status Summary Officer

Reactor Safety Team

Director
Communicators (2)

Reactor Systems Analyst (Reactor Safety Team)

Electrical/I&C Specialists (2)
Foreign Reactor Experts (2)

Protective Measures Team

Director
Communicators (2)
State Interface
Emergency Planning Specialist
Dose Assessment Analysts

Liaison Team

State Liaison
Federal Liaisons (2)
International Liaisons (2)
Public Affairs (2)
Intelligence Community Liaison

Operational Support Team

Coordinator
Word Processing Operator
Electronic Mail Operator
Courier/Facsimile Operator
Automatic Notification System Operator

Information Technology Support

Telecommunications Specialist
Operation Center Information Management System Contractor
Facility Support Contractor (TECOM)

Headquarters Operations Officers (2-3)

Response Coordination Team (2-3)

Regulatory Response Team

Project Director
Enforcement Specialist
OGC Representative

REGION IV BACKUP TEAM OF RESPONDERS

1. Base Team Manager
2. Base Team Secretary
3. Director of Site Operations
4. Dose Assessor

5. Emergency Notification System Communicator (Base Team)
6. Emergency Response Coordinator/Manager
7. Emergency Response Data System Operator (Base Team)
8. Environmental Dose Assessment Coordinator
9. Government Liaison Coordinator/Manager
10. Health Physics Network Communicator (Base Team)
11. Health Physics Specialist
12. Monitoring & Analysis Coordinator - FRMAC
13. Protective Measures Coordinator/Manager
14. Public Affairs Coordinator
15. Radiation Safety Coordinator
16. Reactor Safety Coordinator/Manager
17. Reactor Safety Operations Coordinator
18. Reactor Systems Specialist
19. Resource manager/NRC Field Office Coordinator
20. Safeguards/Security Coordinator (Position Under Review)
21. Status Summary Communicator (Position Under Review)

TIMELINE FOR OPERATIONS CENTER STAFFING FOR STANDBY MODE

Day	Time	Response Level
12/31/99	1100	Relatively small cache of communicators, foreign reactor experts, electrical/I&C experts, and NRC representatives will assemble in the Operations Center in preparation for calls from IAEA and other foreign regulatory bodies. Any reported Y2K-related plant system problems, grid problems, or widespread telecommunication outages will be evaluated for relevancy and communicated to our licensees.
12/31/99	2300	Agency enters Standby response mode. Operations Center is staffed with specialized response staff plus representatives from OE, OGC, and NRR Projects to respond to emergency licensing issues.
01/01/00	0000	Y2K transition begins.
01/01/00	0015	Operations Center communicators conduct "phone checks" of all NPPs and fuel cycle facilities in EST zone. Any Y2K problems are reported to licensees.
01/01/00	0115	Operations Center communicators conduct "phone checks" of all NPPs and fuel cycle facilities in CST zone. Any Y2K problems are reported to licensees.

01/01/00	0215	Operations Center communicators conduct "phone checks" of all NPPs and fuel cycle facilities in MST zone. Any Y2K problems are reported to licensees.
01/01/00	0315	Operations Center communicators conduct "phone checks" of all NPPs and fuel cycle facilities in PST zone. Any Y2K problems are reported to licensees.
01/01/00	0600	The Executive Team member would decide when the response organization could stand down from Standby or if events warrant escalating the NRC response to Initial Activation. Provided that there are no major Y2K-related problems, the NRC would continue to monitor for a couple of days with a small cadre of Y2K experts.

CRITICAL DATES

(From "Circles of Risk" by Jay Golter and Paloma Hawry)

January 1, 2000, is not the only date in the near future that may disrupt data-processing systems. Other dates that could cause disruptions are the following:

January 1, 1999, One-Year-Look-Ahead Date Into Next Century

Many computer programs process data by looking forward one year and counting dates back from that point. If such systems have two-digit date problems that are not corrected in time, they may begin to malfunction or fail at the start of 1999.

August 22, 1999, GPS Rollover

The Global Positioning System (GPS) is a constellation of 24 low-orbiting satellites that continuously signal data that can be used to determine the exact location of any receiver on the surface of the earth. The data are also used by some systems to establish the exact time of day for transaction logging. The clocks on this system report the time as the number of weeks since the launch of the system in 1980. On August 22, 1999, this counter will overflow and return to 0000 (as would happen on the odometer of a car that traveled 1 million miles). At that point some systems, or equipment, that use the GPS signals may malfunction. Among the vulnerable devices are some cellular telephones, devices that track the location of freight shipments, and some navigational equipment. However, many manufacturers of such devices have built their products to handle the rollover period correctly.

September 9, 1999 (9/9/99)

A common programming device was to enter 9999 as a signal that a stack of data had reached its end. This signal may sometimes have been programmed on date fields, with the result that the date 9/9/99 will have a special and unintended meaning in a program. Although the incidence of 1/1/2000 problems appears to be much greater than that of 9/9/99 problems, systems should be checked for each.

February 29, 2000 (Uncommon Leap Year)

The year 2000 is divisible by four and is a leap year. However, years divisible by 100 are not leap years

(1900 was not one) unless they are divisible by 400 (2400 will be another leap year). Some programmers did not know about the hundred-year rule when they wrote their original codes, and those programs will run fine in 2000. Some programmers knew about the hundred-year rule, but not about the four-hundred-year rule, and their programs are likely to fail.

December 31, 2000 (366th Day of Uncommon Leap Year)

Some programs operate by counting the days in the year. If the writers of these programs were unaware of the uncommon-leap-year situation, their systems may not fail until December 31, 2000, the (unexpected) 366th day of the year.

SECY-99-134

May 18, 1999

FOR: The Commissioners
FROM: William D. Travers /s/
Executive Director for Operations
SUBJECT: AGENCY CONTINGENCY PLANS FOR THE YEAR 2000 COMPUTER PROBLEM IN THE NUCLEAR INDUSTRY

PURPOSE:

To obtain Commission approval of agency contingency plans dealing with the Year 2000 (Y2K) problem in the nuclear industry.

BACKGROUND:

The Y2K problem pertains to the potential inability of computers to correctly recognize dates and results primarily from computer hardware or software that uses two-digit fields to represent the year. These systems may misread the year 2000 and cause the systems to fail, generate faulty data, or act in an incorrect manner. The Y2K problem has the potential to interfere with the proper operation of any computer system (including embedded systems), software, or database.

The staff is pursuing a comprehensive program for dealing with potential Y2K problems. The staff completed Y2K remediation of its own systems on February 5, 1999, ahead of the OMB target of March 31, 1999. Because of the nature of the Y2K problem, the staff has prepared contingency/business continuity plans for its mission-critical systems, specifically addressing failures that have the potential to result from the Y2K problem.

Additionally, the staff has been working with nuclear industry organizations and licensees since 1996 to address the Y2K problem. On the basis of audits and inspections of nuclear power plant, fuel cycle facility, and materials licensee Y2K programs to date, we are confident that our licensees will be Y2K ready by December 31, 1999, and that the Y2K transition will not affect the continued safe operation of our licensed facilities.

However, because of the nature of the Y2K issue, it is not possible to be 100-percent certain that all potential problems will be corrected. For this reason, the staff established a task force in September 1998 to develop a contingency plan for ensuring that public health and safety and the environment will continue to be protected, if unforeseen Y2K problems occur.

The staff provided the Commission with a draft of *NRC Contingency Plan for the Year 2000 Issue in the Nuclear Industry* (COMSECY 98-036) in November 1998. The contingency plan presented a reasonably conservative planning scenario for the Y2K transition and anticipated NRC staff actions to be taken in response to potential Y2K problems. The staff sought and received Commission approval to solicit public comment on the draft contingency plan. Public and industry comments were received and have been incorporated in the attached revision of the Y2K contingency plan.

The majority of the comments received on the contingency plan agree with the general scope and direction taken by the staff. However, we recognize the need for further development of the planning details and operational testing of the plan.

On February 19, 1999, a staff requirements memorandum (SRM) was issued on COMSECY-98-036. The SRM provided direction to the staff in three areas: (1) it required the staff to develop and run tabletop exercises and drills modeling potential Y2K scenarios, (2) it required the staff to evaluate and make a recommendation, following stakeholder input, on whether enforcement discretion would be preferable to the use of 10 CFR 50.54(x) in allowing licensees to deviate from license conditions or technical specifications arising from Year 2000 complications that would otherwise require plant shutdown, and (3) it directed the staff to expedite the purchase and deployment of mobile satellite communication equipment at each nuclear power plant site in advance of the Y2K transition. The revised Y2K contingency plan, briefly discussed below, addresses the issues outlined in the SRM.

DISCUSSION:

The revised plan includes an updated evaluation of potential Y2K issues for all types of NRC licensees, with particular emphasis on external interfaces, such as the electric grid and telecommunications infrastructures. As described in the Y2K contingency plan, there is growing confidence that the electric grid and telecommunications infrastructures will remain operable during the Y2K transition. Consequently, the staff believes that the original planning assumptions developed in the draft Y2K contingency plan (e.g., only localized telecommunications and electric power outages) are appropriate and sufficiently conservative for planning purposes. Furthermore, the planning assumptions with regard to the electric power and telecommunications infrastructure are consistent with the latest assessment by The President's Council on the Year 2000 Conversion, dated April 21, 1999 (www.Y2K.gov/java/secassess.html) and the April 30, 1999, North American Electric Reliability Council Y2K status report.

On the basis of the planning assumptions, the staff has prepared a Y2K contingency plan that contains three major facets: incident response, information sharing, and regulatory response.

The incident response facet of the plan describes steps the staff will take in the unlikely but possible event that a Y2K problem would result in a safety-significant event at a nuclear power plant (NPP) or gaseous diffusion plant (GDP), such as a loss of offsite power. As part of the information sharing facet of the plan, a small team of specialists will staff the headquarters Operations Center at noon on December 31, 1999, to monitor, evaluate, and communicate any Y2K problems at foreign reactors that have potential safety implications for domestic reactor licensees. This team would also be available to respond to any potential Y2K problems caused by embedded chips that have a date stamp based on an earlier time zone. Approximately 2 hours before midnight (EST) on December 31, 1999, the headquarters Operations Center will be staffed by a multidisciplinary Y2K response team, headed by the Director of Incident Response Operations. In addition to headquarters staff, the Y2K response team will include resident or regional staff stationed at each NPP and GDP site and a small number of staff at the Incident Response Centers in each region. The NRC Regional IV office in Arlington, Texas, will be prepared to assume the functions of headquarters if an unanticipated Y2K problem results in the unavailability of the headquarters Operations Center. This Y2K response team will be prepared to respond to an event related directly or indirectly to a Y2K problem and would utilize time zone differences to share relevant safety information with those licensees that have not yet experienced the transition.

In support of the regulatory response facet of the plan, the Y2K response team will be prepared to process enforcement discretion requests related to a Y2K problem, particularly in situations in which failure to do so could have an adverse effect on electric grid stability. The staff plans to separately seek

Commission approval on guidance to nuclear power plant licensees on the use of enforcement discretion in situations involving Y2K problems. These guidelines may permit continued plant operation in cases where a Y2K problem may impact compliance with a license requirement but not result in a safety concern.

The revised plan also describes steps the staff is taking to ensure that communications with the nuclear power plant and gaseous diffusion plant sites will be available in the unlikely event of a widespread telephone network outage. Also discussed are the steps the staff is taking to ensure that back-up fuel supplies will be available for the emergency diesel generator for the headquarters Operations Center.

This contingency plan specifically addresses plans for the Y2K transition (i.e., December 31, 1999, through January 1, 2000). For the times outside of the Y2K transition, including February 29, 2000, our review indicates that the potential for a serious event associated with Y2K-related issues is extremely low and carries low attendant risks to public health and safety and the environment. The staff intends to respond to events outside the Y2K transition period by utilizing its normal emergency response posture, which includes around-the-clock staffing of the Operations Center by qualified engineers to receive reports of any events and to initiate the agency's incident response plan.

After the final Y2K Contingency Plan is made publically available, the plan will be placed on the external NRC website. The staff plans to regularly update this plan without seeking additional Commission review, provided that the changes do not involve Commission policy issues.

RESOURCES:

The resources required to implement this contingency plan involve off-hours duty for NRC staff during the period December 31, 1999, through January 1, 2000. Details are provided in an attachment to the contingency plan.

The NRC will procure portable satellite telephones to be placed in the resident inspector offices of all operating nuclear power plants and the two gaseous diffusion plants. Additional satellite telephones will be located at headquarters and in the regional offices. Incident Response Operations staff has retained the services of the consulting firm Booz-Allen and Hamilton to perform a cost-benefit analysis of the available satellite communication systems to support the selection process. The procurement of portable satellite equipment is expected to be completed during fiscal year 1999.

COORDINATION:

The Office of the General Counsel has no legal objection to this paper. The Office of the Chief Financial Officer has reviewed this paper for financial implications and has no objections. The Office of the Chief Information Officer has reviewed this paper and has no information technology or information management concerns.

RECOMMENDATIONS:

Staff request action within 10 days. The staff will not take action until the SRM is received. The development of a Y2K contingency plan is within the delegated authority of the EDO.

William D. Travers
Executive Director for Operations

CONTACT: Joseph G. Giitter, IRO
301-415-7485

ATTACHMENT: *Contingency Plan for the Year 2000 Issue in the Nuclear Industry*
[Adobe Acrobat (1,173KB) or Corel WordPerfect (2,758KB) format]

February 19, 1999

MEMORANDUM	William D. Travers
TO:	Executive Director for Operations
FROM:	Annette L. Vietti-Cook, Secretary /s/
SUBJECT:	STAFF REQUIREMENTS - COMSECY-98-036 - DRAFT NRC CONTINGENCY PLAN FOR THE YEAR 2000 ISSUE IN THE NUCLEAR INDUSTRY

The Commission approved the staff's proposal to make the draft NRC contingency plan for the Year 2000 issue available for public comment. The staff was informed of this decision on December 7, 1998 so they could proceed with public release.

Staff should develop and run tabletop exercises and drills modeling potential Y2K scenarios, to evaluate NRC response capability and contingency plans in the event of various severities of communications and power failures. The adequacy of administrative and emergency response guidelines should be evaluated under multiple expected events and enforcement discretion challenges. Resident, regional and headquarters staffs should provide an integrated response under various telecommunications and power failure modes. If practicable, staff should consider coordinating drills with licensees who plan to model Y2K challenges.

As recommended by the General Counsel, the Commission acknowledges that the use of enforcement discretion may be preferable to the use of 50.54(x) in allowing licensees to deviate from license conditions or technical specifications arising from Year 2000 complications that would otherwise require plant shutdown. The staff should obtain stakeholder input on this key issue and forward a recommendation to the Commission for review and approval as part of the package accompanying the final contingency plan. Shortly thereafter, the staff should brief the Commissioner Assistants on the scope and detailed guidance to be used in Y2K contingencies.

(EDO) (SECY Suspense: 5/21/99)

The Commission approved the staff's recommendations in SECY-98-194 (Upgrading the NRC Operations Center Emergency Telecommunications System), including the staff recommendation to purchase mobile satellite systems for all of the nuclear power plant sites within the next 2-3 years. The staff should expedite the purchase and installation of mobile satellite units at each nuclear power plant site to have this system operational prior to December 31, 1999.

cc: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CIO
CFO
OCA
OIG

Y2K TRAINING AND TABLETOP EXERCISE AGENDA
HOSTED BY
THE U.S. NUCLEAR REGULATORY COMMISSION
WEDNESDAY, JULY 14, 1999

9:00 a.m.	Welcome and Opening Remarks	Greta Joy Dicus, NRC Chairman
9:15 a.m.	Overview Calvert Cliffs Contingency Plan	John Carroll
9:45 a.m.	Overview of Maryland Contingency Plan	Michael Sharon
10:15 a.m.	Overview of Calvert County Contingency Plan	Donald Hall
10:20 a.m.	Overview of St. Mary's County Contingency Plan	Paul Wible
10:50 a.m.	Overview of NRC Contingency Plan	Joseph Giitter
11:10 a.m.	Overview of FEMA Contingency Plan	Karen Sagett
11:40 a.m.	Government Emergency Telecommunications Service (GETS) National Telecommunications Coordinating Network (NTCN)	Mike Lastrina

1:00 p.m. **First Scenario Focus area - Communications**

A Y2K failure results in regional telecommunications outages affecting NRC Headquarters, the State Emergency Operations Center and the site.

2:30 p.m. **Second Scenario Focus area - Plant Operations**

Grid instabilities initiated by a Y2K problem lead to localized power outages and a shutdown of both units of the Calvert Cliffs power plant - communications systems remain available.

3:45 p.m. **Third Scenario Focus area - Command and Control**

Regional power grid disturbance occur as in previous scenario, but require evacuation of NRC White Flint complex.

4:45 p.m. Summary and Conclusion

The NRC Conducts Y2K Training and Tabletop Exercise

The U.S. Nuclear Regulatory Commission (NRC) sponsored a Year 2000 (Y2K) Training and Tabletop Exercise on Wednesday, July 14, 1999 at the Doubletree Hotel in Rockville, Maryland. The exercise was conducted to prepare for the Y2K transition period, with the main focus of sharing information regarding potential consequences of a Y2K initiated event and its impact on the public. Participants from the Federal Emergency Management Agency (FEMA), the National Communications System (NCS), the State of Maryland, St. Mary's and Calvert counties, and Baltimore Gas and Electric Company (Calvert Cliffs Power Plant), as well as regional and headquarters staff from the NRC, were represented at the exercise.

The Honorable Chairman Greta Joy Dicus made opening remarks regarding the NRC's Y2K Contingency Plan:

> " The Y2K problem...is not an unforseen event. It is a known phenomenon that will happen at a precise time. ...Albert Einstein said that 'the only reason for time is so that everything doesn't happen at once.' This particular technological snafu...will happen all at once. It is for this reason that we have developed our Y2K contingency plan."

Other presentations were delivered throughout the morning. Below is a listing of those presentations:

- **"Calvert Cliffs Nuclear Power Plant Y2K Contingency Planning"** presented by Mr. John Carroll, Assistant to the Plant General Manager at the Calvert Cliffs Nuclear Power Plant. Mr. Carroll's presentation concentrated on Calvert Cliffs Y2K contingency plan, specifically discussing the risk assessment and risk management aspects of their plan, and their efforts to ensure that the plant will continue to operate safely through the Y2K transition:

  "We are very confident in the efforts that were made in the assessment and remediation phases of the project and, therefore, we believe...that Calvert Cliffs will continue to operate safely and reliably the night of the roll-over..."
- **"Nuclear Preparedness for the New Millennium"** presented by Mr. Michael J. Sharon, Chief of Nuclear Response Operations, Nuclear Power Plant Emergency Division, Maryland Department of the Environment (MDE). Mr. Sharon's presentation focused on MDE's concept of operations, the status of dose models and information systems, instrumentation requirements, communication questions, and an overview of the contingency planning issues:

  "...There are extensive cooperative efforts. We have been working very closely with Baltimore Gas & Electric and PECO Nuclear to ensure that all of our systems are compatible and that our contingency plans are in place to support emergency response to a nuclear plant accident."
- **Calvert County Y2K Planning** presented by Mr. Donald Hall, Director of Emergency Management for Calvert County. Mr. Hall's presentation centered on the overall emergency management aspects throughout Calvert County, concentrating on the coordination efforts for contingency planning with local utilities such as Baltimore Gas & Electric, Calvert Cliffs Nuclear Power Plant, Southern Maryland Electric Company, Washington Gas, and Bell Atlantic, and the establishment and implementation of a public education and awareness program to alert the

citizens of the upcoming Y2K transition.

"...We're working very closely with [Calvert Cliffs]...and will be very busy and very prepared by the time December 31st gets here...."

- **Paul Wible, Director of the Emergency Management, St. Mary's County** - Mr. Wible did not make a slide presentation, rather, he commented about his concerns on the overall Y2K preparation and upgrades of St. Mary's telephone system, electrical system, and computers and how they will work during the Y2K transition:

  "There are jurisdictions out there that don't exercise their claims, they don't do it, even though the state says you will have an EOP, how many have the opportunity to do what we do every year. And every two years, we're graded on it. Not too many people have that."

- "**U.S. Nuclear Regulatory Commission Contingency Plan for the Year 2000 Computer Problem in the Nuclear Industry**" presented by Mr. Joseph G. Giitter, Chief, Operations Section, Incident Response Operations, Nuclear Regulatory Commission (NRC). Mr. Giitter discussed the planning assumptions for the Y2K contingency plan and briefly described the major parts of the plan, including incident response, information sharing, and regulatory response:

  "NRC has been in the incident response business for a long time. Our procedures are well established and tested and we propose to use those to the extent that we can, not develop new procedures for Y2K. We do recognize that there are Y2K unique circumstances and we have developed procedures for those."

- "**Federal Response Plan Operations Supplement -- Y2K Consequence Management**" presented by Ms. Karen Sagett, Y2K Planning Director, Federal Emergency Management Agency (FEMA). Ms. Sagett's presentation focused on Y2K readiness issues, potential consequences of Y2K disruptions, and the coordination of necessary responses among local, State, and Federal responders:

  "...Nobody really knows what's going to happen....We know when it's going to happen...but we don't know what is going to happen."

- "**Government Emergency Telecommunications Service (GETS)**" **and** "**National Telecommunications Coordinating Network (NTCN)**" presented by Mike Lastrina, National Coordinating Center for Telecommunications. Mr. Lastrina's presentations centered on the services of the Government Emergency Telecommunications Service, the NTCN, and their mission of providing timely and critical communication links to Federal Government departments, other industries, and agencies when the public network is congested or not available:

  "We need to provide...a direct communications link between critical government and industry users, vendors, carriers, for the mitigation of the outages within the public switch network...."

TABLETOP OBJECTIVES

The afternoon session of the tabletop focused on the dialog between the stakeholders on planning issues in preparation for the Y2K topic. The objectives for the tabletop were as follows:

1. Test State, local, licensee, and NRC procedures for dealing with the consequences of significant Y2K initiated events to assure all are adequately prepared to protect the health and safety of the public.
2. Facilitate the mutual understanding and coordination of existing contingency plans in use by State, local, licensee, and NRC for responding to a Y2K initiated event.
3. Allow the NRC to refine its Y2K contingency plan in preparation for the industry-wide Y2K full scale exercise to be conducted on October 15, 1999.

TABLE TOP SCENARIOS

Scenario assumptions were provided to the attendees and were asked to determine the actions their organization would take. The scenarios were as follows:

1. **First Scenario Focus area - Communications** - A Y2K failure results in regional telecommunications outages affecting NRC Headquarters, the State Emergency Operations Center, and the site.
   a. The licensee cannot use Bell Atlantic systems to notify or communicate with State and local organizations.
   b. FTE 2000 is not functioning.
   c. The licensee cannot communicate with NRC using Bell Atlantic systems or FTS 2000.
2. **Second Scenario Focus area - Plant Operations** - Grid instabilities initiated by Y2K problem lead to localized power outages and a shutdown of both units of the Calvert Cliffs power plant - communications systems remain available.
   a. Communications are available
   b. Calvert Cliffs loses both offsite power sources following a regional grid disturbance.
   c. Calvert Cliffs is shutdown automatically due to offsite power loss.
   d. Emergency power must be used to safely cool down the plant.
3. **Third Scenario Focus area - Command and Control** - Regional power grid disturbances occur as in previous scenario but require evacuation of NRC White Flint complex.
   a. Same initiating conditions as in previous scenario
   b. Rockville, Maryland is included in outage area.
   c. NRC's backup diesel generator fails and NRC staff cannot occupy White Flint complex.
   d. Communications are temporarily available.

MAJOR TABLETOP LESSONS LEARNED

As the scenarios were played out by the attendees, scenario issues and lessons learned were created. The scenario lessons learned are as follows:

1. **Explore the use of Federal government national security/emergency preparedness telecommunications systems and services, like the National Telecommunications Coordinating Network and the Government Emergency Telecommunications Service, for State and local officials?**

Many Federal NS/EP services are already available to State and local responders. Among these are the Government Emergency Telecommunication Service (GETS), which provides priority access to long distance service, and Telecommunication Service Priority (TSP), which provides high priority restoration of services. For additional information on these services, along with point of contact information, see the NCS web. Included in this website is information that State and local responders can use to obtain GETS cards.

2. **Ensure that satellite-based communication systems relied on in your contingency plan are compatible.**

   All satellite-based communications used under the NRC contingency plan will be provided by the same vendor and use the same satellite service (Iridium). Compatibility problems between NRC responders should not be an issue under these circumstances. If licensees use different satellite systems and experience failures of all other telecommunications systems, they may ask the on-site resident inspector to use the NRC satellite phone. Another possibility would be to rely on the bridging capability of the National Telecommunication Coordination Network. Because this capability is limited, however, it is recommended that licensees first ask the resident inspector on-site to use the NRC provided satellite phone, if necessary.

3. **Will information from the White House Information Coordination Center be available to county Emergency Operation Centers?**

   The NRC will raise the issue of information sharing with State and local EOCs in the discussions of the domestic Interagency Working Group of the President's Y2K Council.

4. **In the unlikely event that the NRC Y2K response team has to rely on back-up communication systems, it should be prepared to limit the amount of information requested from the licensee and others since there will be a significantly reduced number of communication channels available.**

   Normal NRC response procedures require that information requests be prioritized and controlled. These procedures will be followed during the Y2K response.

5. **NRC should ensure that Y2K issues or problems with generic implications are shared with all potentially affected licensees, through the Y2K Early Warning System, through owners groups information sharing systems, or through some other information sharing system.**

   The NRC intends to post all known Y2K information associated with U.S. nuclear power plants on YEWS. All licensees are being offered access to YEWS on a read only basis. Information on how to get access to YEWS is being provided to licensees by means of an Information Notice.

6. **NRC should develop a Public Communication Plan for Y2K. Baltimore Gas & Electric has offered to share their plan with the NRC.**

The NRC plan for public communications during the Y2K transition will be developed to supplement the main Federal public information effort which is associated with the White House Information Coordination Center.

7. **The back-up NRC Operations Center in Region IV (Texas) has very limited emergency power capability. Region IV should explore the feasibility of augmenting the existing emergency power supply.**

   The NRC is exploring options for providing backup power for the Region IV IRC.

8. **NRC headquarters needs to provide Region IV with a list of key Federal, State and licensee contacts.**

   The list will be provided to Region IV prior to the October Y2K exercise.

9. **NRC should consider putting copies of licensees Y2K contingency plans for communications in the headquarters operations center and the regional Incident response centers.**

   This suggestion will be pursued by the NRC. These plans would be useful in the event of localized telephone disruption in the vicinity of a licensee facility.

LIST OF ATTENDEES

Federal Emergency Management Agency
Nancy Goldstein
Craig Fiore
Karen Sagett
Ron Van

St. Mary's County, Maryland
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Rich Emch
Tom Essig
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Pat Gwynn
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CONTRIBUTORS TO TABLETOP EXERCISE

NRC staff responsible for the planning, coordination, and conduct of this tabletop exercise were Joseph Giitter, Eric Weinstein, John MacKinnon, and Mary Glenn Crutchley, all from Incident Response

Operations.

SECY-99-173

July 2, 1999

FOR: The Commissioners
FROM: William D. Travers /s/
Executive Director for Operations
SUBJECT: DENIAL OF PETITIONS FOR RULEMAKING SUBMITTED BY THE NUCLEAR INFORMATION AND RESOURCE SERVICE

PURPOSE:

To obtain the Commission's approval to publish in the *Federal Register* notices of denial of the petitions for rulemaking (PRM-50-65, PRM-50-66, and PRM-50-67) submitted by the Nuclear Information and Resource Service (NIRS).

BACKGROUND:

The Nuclear Regulatory Commission (NRC) received the subject petitions for rulemaking (PRM-50-65, PRM-50-66, and PRM-50-67) from the NIRS, each dated December 10, 1998. The petitioner requested that the NRC amend its regulations to require the following actions be accomplished:

(1) That nuclear facilities be shut down if they are not compliant with date-sensitive, computer-related issues regarding Y2K. The petitioner requested that the NRC take this action to ensure that Y2K issues will not cause the failure of nuclear safety systems and thereby pose a threat to public health and safety.

(2) That every nuclear utility conduct a full-scale emergency planning exercise that involves coping with a date-sensitive, computer-related failure resulting from a Y2K issue. The petitioner requested that the NRC take this action to ensure that nuclear power plant licensees have developed and can implement adequate contingency and emergency plans to address major system failures that may be caused by a Y2K problem.

(3) Ensure that the safety systems of reactors and other nuclear facilities have reliable back-up sources of electricity in the event of a Y2K incident.

On January 25, 1999, the NRC published notices of receipt of the petitions for rulemaking in the *Federal Register* (64 FR 3789; 64 FR 3791; and 64 FR 3792). Because of the nature of these petitions and the date-specific issues they address, the petitioner requested that the petitions be filed expeditiously and that public comment on the actions be limited to 30 days. The notice of receipt of a petition for rulemaking invited interested persons to submit comments by February 24, 1999.

A total of 70 comments were received on PRM-50-65, with 54 commenters agreeing with the petition and 16 commenters opposing the petition.

A total of 64 comments were received on PRM-50-66, with 46 commenters agreeing with the petition and 18 commenters opposing the petition.

A total of 73 comments were received on PRM-50-67, with 56 commenters agreeing with the petition and 17 commenters opposing the petition.

Many of the comments docketed under PRM-50-65 responded to all three petitions.

DISCUSSION:

In developing the decisions on the NIRS petitions, the staff considered the information provided in the petitions and the comments received in response to the notice of receipt of the petitions. Although the majority of the comments received supported the petition, the planning and implementation activities by the industry, the oversight provided by the NRC in addressing the Y2K problem at licensed nuclear facilities, and the existing regulations, have provided sufficient basis to deny the petitions.

In PRM-50-65, the petitioner requested that the NRC adopt the following text as a rule:

> Any and all facilities licensed by the Nuclear Regulatory Commission under 10 CFR Parts 30, 40, 50, and 70 shall be closed by 12 pm Eastern Standard Time, December 1, 1999, unless and until each facility has: (a) fully and comprehensively examined all computer systems, embedded chips, and other electronic equipment that may be date-sensitive to ensure that all such systems that may be relevant to safety are Y2K compliant; (b) repaired, modified, and/or replaced all such systems that are not found to be Y2K compliant; (c) made available to the public all information related to the examination and repair, modification and/or replacement of all such systems; (d) determined, through full-scale testing, that all repairs, modifications, and/or replacements of all such systems are, in fact, Y2K compliant.

The NRC staff has determined that the actions taken by the licensees to implement a systematic and structured facility-specific Y2K readiness program and the NRC's oversight of the licensees' implementation of these Y2K readiness programs provide reasonable assurance of adequate protection to public health and safety. The petition is denied for the reasons cited in detail in the *Federal Register* notice (Attachment 1A).

In PRM-50-66, the petitioner requested that the NRC adopt the following text as a rule:

> All licensees subject to 10 CFR Part 50 and Appendix E will conduct a full-scale emergency planning exercise (as normally required under 10 CFR 50.47) during 1999. This exercise shall include a component that includes failure of one or more computer or other digital systems (this is popularly known as the "Y2K bug") on January 1, 2000, or other relevant date. Licensees that do not conduct, or that fail, this exercise shall close their facilities licensed under this part by December 1, 1999, until such time as the licensees have conducted a successful exercise.

The NRC staff has determined that the existing required emergency operating and emergency plans, along with actions taken by the licensees to implement systematic and structured Y2K readiness contingency plans for critical Y2K dates, and NRC's oversight of the licensees' implementation of these Y2K readiness contingency plans provide reasonable assurance of adequate protection to public health and safety. The petition is denied for the reasons cited in detail in the *Federal Register* notice (Attachment 1B).

In PRM-50-67, the petitioner requested that the NRC adopt the following text as a rule:

The Nuclear Regulatory Commission recognizes that date-sensitive computer programs, embedded chips, and other electronic systems that perform a major role in distributing, allocating, and ensuring electric power throughout the United States may be prone to failure beginning on January 1, 2000. Loss of all alternating current electricity from both the offsite power grid and onsite emergency generators (commonly known as "station blackout,") long has been identified by the NRC as among the most prominent contributors to risk for atomic reactors.

(1) For these reasons, the NRC requires of Part 50 and 70 licensees as of December 1, 1999: (a) that all emergency diesel generators that provide back-up power to nuclear licensees must be operational and remain operational; (b) that licensees that cannot demonstrate full operational capabilities of all emergency diesel generators must close until such time that full operational capabilities of emergency diesel generators are attained; (c) that all licensees must have a 60-day supply of fuel for emergency diesel generators.

(2) Further, to ensure adequate protection of public health and safety, the NRC requires that all licensees under these sections must provide alternate means of back-up power sufficient to ensure safety. These may include, but are not limited to: solar power panels, wind turbines, hydroelectric power, biomass power, and other means of generating electricity. These additional back-up systems must provide electricity directly to the licensee rather than to the broader electrical grid.

(3) Irradiated fuel pools are to be immediately classified as Class 1-E; back-up power systems must be sufficient to provide cooling for such pools.

Licensees which cannot demonstrate compliance with sections (1) and (2) must cease operations as of December 1, 1999, until compliance with these sections is attained.

The NRC staff has determined that the actions taken by the licensees to implement a systematic and structured Y2K readiness program adequately address Y2K issues and NRC's oversight of the implementation of these industry programs provide reasonable assurance of adequate protection to public health and safety. The petition is denied for the reasons cited in detail in the *Federal Register* notice (Attachment 1C).

CONCLUSION:

The staff agrees that the Y2K issue is significant and acknowledges the importance of the issues raised by the petitioners. However, the staff has concluded that these issues can be and are being addressed without implementation of new rules.

The staff recommends that the Commission deny the petitions for rulemaking related to Y2K issues. The staff considers that the actions taken by licensees to address Y2K issues and NRC's oversight of these activities provide reasonable assurance of adequate protection to public health and safety. Establishing new prescriptive regulations, as proposed by the petitioner, is not necessary to ensure safe operation of facilities and the ability of the facilities to shutdown safely in the event of a Y2K incident.

RECOMMENDATION:

That the Commission:

1. Approve the *Federal Register* notices that deny the petitions (Attachments 1A-1C).

2. Note:

   a. The petitioner will be informed of this action (Attachment 2).

   b. The appropriate congressional committees will be informed of this action (Attachment 3).

   c. Upon publication of the notices of denial in the *Federal Register*, the Office of Administration will make the notices of denial available on NRC's rulemaking web site.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection to its content. The Office of the Chief Information Officer has reviewed this paper for information technology and information management implications and concurs in it.

William D. Travers
Executive Director for Operations

CONTACT: M. Chiramal, DE/NRR 415-2845
M. Gareri, DE/NRR 415-1014

Attachments:
1. a. *Federal Register* Notice 50-65
   b. *Federal Register* Notice 50-66
   c. *Federal Register* Notice 50-67
2. Letter to Petitioner Michael Marriotte, Nuclear Information and Resource Service
3. Letters to Congress -- Honorable Joe L. Barton and Honorable James M. Inhofe

August 10, 1999

MEMORANDUM William D. Travers
TO: Executive Director for Operations
FROM: Annette Vietti-Cook, Secretary /s/
SUBJECT: STAFF REQUIREMENTS - SECY-99-173 - DENIAL OF PETITIONS FOR RULEMAKING SUBMITTED BY THE NUCLEAR INFORMATION AND RESOURCE SERVICE

The Commission has approved the staff's recommendation to publish in the Federal Register notices of denial of the petitions for rulemaking (PRM-50-65, PRM-50-66, and PRM-50-67) submitted by the Nuclear Information and Resource Service (NIRS) subject to the comments and changes noted in the attachment.

(EDO) (SECY Suspense: 9/10/99)

Attachment: Comments and changes to the Federal Register notice and letters

cc: Chairman Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CIO
CFO
OCA
OIG
OPA
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR
DCS

Attachment

Comments and changes to the Federal Register notice and letters

General comments

1. The staff should **continue** to ensure that its communication with stakeholders regarding the status of Y2K activities at nuclear facilities and the NRC's oversight of these activities is timely and thorough.
2. The staff should update the three FRN notices to reflect the results of the licensee responses to GL 98-01 and its supplement and, to the extent practicable, should include information pertaining to the stated June and July milestones.

Changes to the Federal Register notice (Attachment 1A)

1. On page 1, paragraph 1, last line, insert "reasonable assurance of" between "provide" and "adequate protection".

2. On page 7, the time interval between July 1 and December 31 is characterized as a "5-month time period" between GL 98-01 response date and the date when most Y2K-induced problems are likely to occur. Obviously, it is six months. On page 16, the term "5-month period" refers to July 1 through December 1, which is characterized as the period for NRC review and evaluation of licensee responses. As discussed in SECY-99-162, any licensee who is not Y2K ready by September 30 will be subject to additional NRC regulatory action which may include issuance of an order requiring specific actions. The text should be revised so that the time frames in question are appropriately characterized and accurately described.

Federal Register notice (Attachment 1C)

1. On page 1, revise lines 4 and 5 to read ' ... backup power sources to power atomic safety systems of reactors and other nuclear facilities facility safety systems in the event of a ....'

2. On page 1, line 10, insert a comma after 'review.'

3. On page 2, line 2 from the top, delete the 's' in 'provides.'

4. On page 12, the discussion about diesel generators in the second paragraph should be revised to read:

   "For pilot plants, diesel generators continue to be inspected and evaluated using..."

5. On page 22, the last sentence of the first paragraph is confusing and should be revised to read:

   "Thus, it is unclear how the requested requirements in the NIRS petition would provide assurance that Y2K problems will not prevent electrical power systems from performing their necessary safety function. The NRC concludes that a rule change is not necessary since licensees are already directly addressing spent fuel pool cooling as part of their Y2K programs."

6. On page 24, the first paragraph provides a discussion regarding the time interval (i.e., three years) that forced circulation cooling is needed to remove decay heat from spent fuel. The Commission understands that, with the exception of Zion 2 and Big Rock Point, it has been more than three years since any of these plants irradiated any fuel in the reactor vessel. Given that the staff is currently revisiting this issue -- specifically the time interval for which forced cooling is required as discussed in SECY-99-168, the text should be revised to read:

   "After a period of decay in the spent fuel pool, the heat load from spent fuel is significantly reduced as short-lived fission products decay. Consequently, ... action is greater. With the exception of Zion and Big Rock Point, more than three years has elapsed since any fuel was irradiated in the reactor at any of the nuclear power plants currently undergoing decommissioning."

Letters (Attachment 3)

1. The staff should send similar letters to Senators Bennett and Dodd and Congressmen Horn and Turner.

2. The transmittal letters to the petitioner and Congress should provide a copy of the recently released NRC Preliminary Report on Nuclear Power Plant Year 2000 Readiness, dated July 19, 1999.

3. On page 1, paragraph 2, line 1, delete the slash after 'requiring.'

4. On page 1, paragraph 2, line 5, insert the following between the existing sentences:

   The NRC has received reports from all 103 operating nuclear power plant units. Seventy three units indicated that their computer systems supporting safe plant operation are "Y2K ready." The remaining 30 units reported that they have additional work to complete on a few computer systems or devices to be fully Y2K ready and provided schedules for completing the work. None of the remaining work affects the ability of a plant to shutdown safely, if needed.

5. The staff should enhance the discussion in the letters regarding the extent of Y2K oversight activities that have been and will be conducted by the NRC.

SECY-99-162

June 22, 1999

FOR: The Commissioners
FROM: William D. Travers /s/
Executive Director for Operations
SUBJECT: POLICY FOR REGULATORY ACTIONS FOR LICENSEES OF NUCLEAR POWER PLANTS THAT HAVE NOT COMPLETED YEAR 2000 READINESS ACTIVITIES

PURPOSE:

To obtain the Commission's approval of a proposed policy for regulatory actions the staff would take for licensees of nuclear power plants that have not completed their year 2000 (Y2K) readiness activities, including remediation and contingency planning, by July 1, 1999. Development of the proposed policy is consistent with commitments made to Congress by the NRC Executive Director for Operations (EDO) in testimony given on February 24, 1999, and by the Chairman in her letter to Congressman Edward J. Markey dated May 3, 1999, which state that the NRC will assess licensees' Y2K preparedness and determine the need for plant-specific regulatory action, up to and including the issuance of shutdown orders.

This policy supplements the agency Y2K contingency plans (SECY-99-134) and the policy on enforcement discretion for Y2K-related issues (SECY-99-135), both provided to the Commission on May 18, 1999.

BACKGROUND:

Pursuant to the Atomic Energy Act of 1954, as amended (AEA), and the Energy Reorganization Act of 1974, the NRC has broad authority to regulate nuclear power facilities as it deems necessary or appropriate in order to protect the public health and safety and the common defense and security. Sections 161b and 161i(3) of the AEA authorize the Commission to issue orders as may be "necessary or desirable to promote the common defense and security or to protect health or minimize danger to life or property" and to issue orders "to govern any activity authorized pursuant to this Act ... in order to protect health and minimize danger to life or property." Section 182 of the AEA requires the Commission to ensure that nuclear facilities operate "in accord with the common defense and security and ... provide adequate protection to the health and safety of the public."

Although the possibility is remote, there may be unanticipated Y2K issues at several generating facilities (both non-nuclear and nuclear) whose cumulative effect could adversely affect the overall grid. Hence, if a Y2K deficiency at a nuclear power reactor were to cause the reactor to trip or experience a transient during the Y2K transition, there could be a detrimental effect on the grid. This, in turn, could adversely affect the public health and safety and/or the common defense and security of the United States. To address this concern, the Commission may elect, for a plant with identified Y2K deficiencies, to conduct management meetings with a licensee and/or schedule reactive inspections to evaluate the significance of the Y2K deficiencies. Licensees may take voluntary actions to restrict or modify plant operations as a result of Y2K deficiencies, similar to voluntary actions taken by licensees in anticipation of severe

weather such as hurricanes[(1)]. Where there may be a lack of reasonable assurance of adequate protection of the public health and safety and the common defense and security, the Commission may order a licensee to take remedial actions, restrict plant operations, and/or shut down the plant in anticipation of the Y2K transition.

DISCUSSION:

Since 1996, the NRC has been working with nuclear power plant licensees to ensure that plant systems are "Y2K-ready" before 2000. In Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," the NRC requested all holders of operating licenses for nuclear power plants to: (1) inform the NRC of steps they are taking to ensure that computer systems will function properly by 2000; and (2) by July 1, 1999, provide a status report with a completion schedule for any remaining effort required for Y2K readiness. All licensees responded to part (1) of the generic letter, stating that they have adopted an NRC-accepted industry program that examines both safety-related and non-safety-related systems and components, and that the program is being implemented to ensure that plants are Y2K-ready by 2000.

Supplement 1 to GL 98-01 was issued by NRC in January 1999, and provides an alternative to part (2) of the generic letter. The alternative request for information, which is voluntary, expands the scope of the reporting requirements to include the systems that are necessary for continued plant operation and that are not covered by the terms and conditions of the plant's license and NRC regulations. Utilities that choose this option will report on plant Y2K readiness for systems within their license and NRC regulations plus all those systems required for continued plant operation.

In July 1999, the staff will review all licensee responses to GL 98-01 and its supplement and will appropriately follow up any responses that raise concerns. By September 30, 1999, the NRC staff will determine the need for regulatory action to address Y2K readiness issues at specific licensees. At this time, the staff believes that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and does not believe that significant plant-specific action directed by the NRC is likely to be needed.

On the basis of current staff and industry projections, it is anticipated that about 80 percent of all plants will be Y2K-ready by July 1, 1999, and that the remaining plants will only have a few issues to resolve to be Y2K-ready. It is further expected that of those plants that are not Y2K-ready by July 1, 1999, about half will be ready by September 30, 1999, and the remaining half will have completed Y2K readiness activities by November 30, 1999. Individual plant readiness delays are expected to involve only a few components or systems. Typical delays may be due to awaiting the delivery of a replacement component or a scheduled outage to implement a repair. Hence, it is considered unlikely that any plants will have Y2K deficiencies after November 30, 1999.

Licensees of plants with a projected completion date by September 30, 1999, will be monitored to ensure that the schedules are maintained. Completion of plant-specific items identified by licensees in the generic letter responses will be documented in routine NRC inspection reports. No additional Y2K-oversight is planned unless site-specific issues arise that indicate further scrutiny would be advisable or changes in completion dates delay plant Y2K readiness beyond September 30, 1999.

The licensees of the remaining plants (estimated to be about 10 units) will receive additional scrutiny on a case-by-case basis to ensure that no Y2K deficiencies remain after November 30, 1999. Each plant will

be grouped according to the status of contingency planning and the following types and functions of systems and components that are not Y2K-ready:

(A) Plants with systems and components that are not Y2K-ready and whose direct, on-line functioning is required for nuclear safety and protection of the reactor, including safe reactor shutdown and mitigation of design basis events (for example, systems covered by license conditions, including technical specifications). Plants without completed contingency plans for these systems and components will also be included in this category.

(B) Plants (not included in Category A) with systems and components that are not Y2K-ready and that are not directly required for nuclear safety and reactor protection, but that could cause a reactor to trip or experience a transient, or could have an adverse effect on the operation of reactor safety systems. Plants without completed contingency plans for these systems and components will also be included in this category.

(C) Plants (not included in Category A or B) with other systems and components that are not Y2K-ready and/or have incomplete contingency plans for these systems and components (for example, administrative systems).

The licensee of any plant in Category A or B that has not completed Y2K readiness activities by November 30, 1999, will be subject to additional NRC regulatory action which may include issuance of an order requiring specific actions. The NRC staff will evaluate the licensee's assessment of any adverse impact on nuclear safety and reactor protection, including the potential for a transient or plant trip during the Y2K transition. The NRC staff will also evaluate the possible impact on public health and safety and common defense and security, considering the potential concern associated with operation during the Y2K transition. The staff will then conduct a thorough assessment of the likelihood that the licensee will be able to remediate the Y2K deficiencies so that the plant will be Y2K-ready before the end of December 1999, and determine the potential impact of unremediated deficiencies.

If the staff concludes that the likelihood of completing remedial actions prior to the Y2K transition is questionable and the consequences of unremediated deficiencies are substantial, then the staff will prepare orders, as determined by the Director of the Office of Nuclear Reactor Regulation (NRR) (or his designee) with concurrence from the appropriate regional administrator (or his designee), up to and including a plant shutdown, sufficiently in advance of the Y2K transition to ensure that the plant is in a stable, safe condition during the Y2K transition. Although considered unlikely, a licensee may be ordered to take specific actions or to shut down the plant even though all regulatory requirements may be met. The Commission will be consulted prior to the issuance of any order regarding Y2K matters.

Subsequent to a Y2K-related shutdown, each plant startup decision and lifting of an order will be based on an NRC staff review of the licensee's assessment that all Y2K-related operational issues necessitating a plant shutdown have been satisfactorily addressed.

Licensees of plants in Category C may receive additional regulatory oversight as determined on a case-by-case basis by the NRC staff. This oversight could be in the form of management discussions and/or meetings, additional audits, or requests for additional information. No orders affecting plant operations would be considered because Y2K deficiencies in systems or components that place a plant in this category would not be expected to affect nuclear safety or grid stability or reliability.

RESOURCES:

The resources required to implement the attached Y2K readiness activities are included in the resource estimate for the NRC "Contingency Plan for the Year 2000 Issue in the Nuclear Industry," and in the offices' approved budgets.

COORDINATION:

The Office of the General Counsel has no legal objection to this paper. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections to it. The Office of the Chief Information Officer has reviewed this paper and has no information technology or information management concerns.

RECOMMENDATION:

The staff recommends that the Commission approve the attached policy for staff action for nuclear power plants that have not completed Y2K readiness activities by July 1, 1999. The staff further recommends that the Commission authorize the staff to publicly release this policy before July 1, 1999. The staff will not release this policy until directed to do so by the Commission.

Notes:

1. This policy will become effective upon approval by the Commission and will be in effect through January 31, 2000.

2. This policy does not contain information collection requirements that are subject to the Paperwork Reduction Act.

3. The staff has determined that this is not a "major" rule as defined in the Small Business Regulatory Enforcement Fairness Act of 1996, 5 U.S.C. 804(2).

William D. Travers
Executive Director for Operations

CONTACT: Richard Wessman, NRR
415-3298

Allen Hansen, NRR
415-1390

Attachment: Policy for Regulatory Action for Licensees of Nuclear Power Plants That Have Not Completed Year 2000 Readiness Activities by July 1, 1999

ATTACHMENT

POLICY FOR REGULATORY ACTION FOR LICENSEES OF NUCLEAR POWER PLANTS THAT HAVE NOT COMPLETED YEAR 2000 READINESS ACTIVITIES BY JULY 1, 1999

- 1. INTRODUCTION
- 2. BACKGROUND
- 3. REGULATORY BASIS
- 4. REGULATORY POLICY
  - 4.1 Licensees of Plants That Complete Y2K Program Activities by July 1, 1999
  - 4.2 Licensees of Plants That Complete Y2K Program Activities by September 30, 1999
  - 4.3 All Other Licensees

1. INTRODUCTION

The Commission has approved the following policy for the NRC staff to follow to determine appropriate regulatory action for licensees of nuclear power plants that have not completed Year 2000 (Y2K) readiness activities, including formulation and implementation of contingency plans, by July 1, 1999. This policy supplements the agency Y2K contingency plans (SECY-99-134) and the policy on enforcement discretion for Y2K-related issues (SECY-99-135), both provided to the Commission on May 18, 1999.

2. BACKGROUND

Since 1996, the NRC has been working with nuclear power plant licensees to ensure that plant systems are "Y2K-ready" before 2000. In Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," the NRC requested all holders of operating licenses for nuclear power plants to: (1) inform the NRC of steps they are taking to ensure that computer systems will function properly by 2000; and (2) by July 1, 1999, provide a status report with a completion schedule for any remaining effort required for Y2K readiness. All licensees responded to part (1) of the generic letter, stating that they have adopted an NRC-accepted industry program that examines both safety-related and non-safety-related systems and components, and that the program is being implemented to ensure that plants are Y2K-ready by 2000.

Supplement 1 to GL 98-01 was issued by NRC in January 1999, and provides an alternative to part (2) of the generic letter. The alternative request for information, which is voluntary, expands the scope of the

reporting requirements to include the systems that are necessary for continued plant operation and that are not covered by the terms and conditions of the plant's license and NRC regulations. Utilities that choose this option will report on plant Y2K readiness for systems within their license and NRC regulations plus all those systems required for continued plant operation.

In July 1999, the staff will review all licensee responses to GL 98-01 and its supplement and will appropriately follow up any responses that raise concerns. By September 30, 1999, the NRC staff will determine the need for regulatory action to address Y2K readiness issues at specific licensees. At this time, the staff believes that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and does not believe that significant plant-specific action directed by the NRC is likely to be needed.

3. REGULATORY BASIS

Pursuant to the Atomic Energy Act of 1954, as amended (AEA), and the Energy Reorganization Act of 1974, the NRC has broad authority to regulate nuclear power facilities as it deems necessary or appropriate in order to protect the public health and safety and the common defense and security. Sections 161b and 161i(3) of the AEA authorize the Commission to issue orders as may be "necessary or desirable to promote the common defense and security or to protect health or minimize danger to life or property" and to issue orders "to govern any activity authorized pursuant to this Act ... in order to protect health and minimize danger to life or property." Section 182 of the AEA requires the Commission to ensure that nuclear facilities operate "in accord with the common defense and security and ... provide adequate protection to the health and safety of the public."

Although the possibility is remote, there may be unanticipated Y2K issues at several generating facilities (both non-nuclear and nuclear) whose cumulative effect could adversely affect the overall grid. Hence, if a Y2K deficiency at a nuclear power reactor were to cause the reactor to trip or experience a transient during the Y2K transition, there could be a detrimental effect on the grid. This, in turn, could adversely affect the public health and safety and/or the common defense and security of the United States. To address this concern, the Commission may elect, for a plant with identified Y2K deficiencies, to conduct management meetings with a licensee and/or schedule reactive inspections to evaluate the significance of the Y2K deficiencies. Licensees may take voluntary actions to restrict or modify plant operations as a result of Y2K deficiencies, similar to voluntary actions taken by licensees in anticipation of severe weather such as hurricanes[(2)]. Where there may be a lack of reasonable assurance of adequate protection of the public health and safety and the common defense and security, the Commission may order a licensee to take remedial actions, restrict plant operations, and/or shut down the plant in anticipation of the Y2K transition.

4. REGULATORY POLICY

All licensees' generic letter responses and NRC audit reports related to plant-specific Y2K programs (including the results of the NRC inspector Y2K reviews currently being conducted at all operating power reactors) will be reviewed to determine which licensees have not completed their Y2K readiness activities and contingency plans. This review will include determining which systems or components are not Y2K-ready or compliant, the extent of the remaining work, and the schedule for completion of work.

On the basis of current staff and industry projections, it is anticipated that about 80 percent of all plants

will be Y2K-ready by July 1, 1999, and that the remaining plants will only have a few issues to resolve to be Y2K-ready. It is further expected that of those plants that are not Y2K-ready by July 1, 1999, about half will be ready by September 30, 1999, and the remaining half will be completed by November 30, 1999.

4.1 Licensees of Plants That Complete Y2K Program Activities by July 1, 1999

Licensees that report they have completed their Y2K readiness activities, including remediation and contingency planning, by July 1, 1999, will not undergo additional Y2K-related inspection.

4.2 Licensees of Plants That Complete Y2K Program Activities by September 30, 1999

Licensees of plants (not included in Section 4.1) with a projected completion date by September 30, 1999, will be monitored to ensure that the schedules are maintained. Staff confirmation of the completion of plant-specific items identified by licensees in the generic letter responses will be documented in routine NRC inspection reports. No additional Y2K-oversight is planned unless site-specific issues arise that indicate further scrutiny would be advisable or changes in completion dates delay plant Y2K readiness beyond September 30, 1999.

4.3 All Other Licensees

The remaining licensees of plants (estimated to be about 10 units) will receive additional scrutiny on a case-by-case basis to ensure that no Y2K deficiencies remain after November 30, 1999. Each plant will be grouped according to the status of contingency planning and the following types and functions of systems and components that are not Y2K-ready:

(A) Plants with systems and components that are not Y2K-ready and whose direct, on-line functioning is required for nuclear safety and protection of the reactor, including safe reactor shutdown and mitigation of design basis events (for example, systems covered by license conditions, including technical specifications). Plants without completed contingency plans for these systems and components will also be included in this category.

(B) Plants (not included in Category A) with systems and components that are not Y2K-ready and that are not directly required for nuclear safety and reactor protection but that could cause a reactor to trip or experience a transient, or could have an adverse effect on the operation of reactor safety systems. Plants without completed contingency plans for these systems and components will also be included in this category.

(C) Plants (not included in Category A or B) with other systems and components that are not Y2K-ready and/or have incomplete contingency plans for these systems and components (for example, administrative systems).

The licensee of any plant in Category A or B that has not completed Y2K readiness activities by November 30, 1999, will be subject to additional NRC regulatory action which may include issuance of an order requiring specific actions. The NRC staff will evaluate the licensee's assessment of any adverse

impact on nuclear safety and reactor protection, including the potential for a transient or plant trip during the Y2K transition. The NRC staff will also evaluate the possible impact on public health and safety and common defense and security, considering the potential concern associated with operation during the Y2K transition. The staff will then conduct a thorough assessment of the likelihood that the licensee will be able to remediate the Y2K deficiencies so that the plant will be Y2K-ready before the end of December 1999, and determine the potential impact of unremediated deficiencies.

If the staff concludes that the likelihood of completing remedial actions prior to the Y2K transition is questionable and the consequences of unremediated deficiencies are substantial, then the staff will prepare orders, as determined by the Director of the Office of Nuclear Reactor Regulation (NRR) (or his designee) with concurrence from the appropriate regional administrator (or his designee), up to and including a plant shutdown, sufficiently in advance of the Y2K transition to ensure that the plant is in a stable, safe condition during the Y2K transition. Although considered unlikely, a licensee may be ordered to take specific actions or to shut down the plant even though all regulatory requirements may be met. The Commission will be consulted prior to the issuance of any order regarding Y2K matters.

Subsequent to a Y2K-related shutdown, each plant startup decision and lifting of an order will be based on an NRC staff review of the licensee's assessment that all Y2K-related operational issues necessitating a plant shutdown have been satisfactorily addressed.

Licensees of plants in Category C may receive additional regulatory oversight as determined on a case-by-case basis by the NRC staff. This oversight could be in the form of management discussions and/or meetings, additional audits, or requests for additional information. No orders affecting plant operations would be considered because Y2K deficiencies in systems or components that place a plant in this category would not be expected to affect nuclear safety or grid stability or reliability.

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1. For example, plants subject to hurricanes, such as Turkey Point on the Florida coast and Brunswick on the North Carolina coast, have procedures that require the units to be shut down in anticipation of hurricane-force winds, even though all regulatory requirements may be met.

2. For example, plants subject to hurricanes, such as Turkey Point on the Florida coast and Brunswick on the North Carolina coast, have procedures that require the units to be shut down in anticipation of hurricane-force winds, even though all regulatory requirements may be met.

August 5, 1999

MEMORANDUM William D. Travers
TO: Executive Director for Operations
William M. Beecher
Director, Office of Public Affairs
FROM: Annette Vietti-Cook, Secretary /s/
SUBJECT: STAFF REQUIREMENTS - SECY-99-162 - POLICY FOR REGULATORY ACTIONS FOR LICENSEES OF NUCLEAR POWER PLANTS THAT HAVE NOT COMPLETED YEAR 2000 READINESS ACTIVITIES

The Commission has approved the policy for staff action for nuclear power plants that have not completed Y2K readiness activities by July 1, 1999, subject to the comments provided below.

1. The policy needs further clarification so that stakeholders understand that nuclear power plants will be in a stable, safe condition during the Y2K transition, and that regulatory action, where appropriate, will be taken sufficiently in advance of the Y2K rollover date (i.e, as soon as September 30, but no later than December 1, 1999). The staff should clarify that if, by September 30, it appears that Y2K readiness activities will not be completed in advance of the December 31, 1999 transition, the NRC will take appropriate regulatory action, including issuance of orders, if warranted. These regulatory actions should be consistent with the NRC's Y2K Contingency Plan and the Interim Enforcement Policy for the Y2K transition. The staff should update the policy to reflect the receipt and analysis of the responses to Generic Letter 98-01 and its Supplement. This update should include the current and projected completion dates for Y2K readiness.

2. In addition to providing this policy to the public, further efforts to increase public confidence in Y2K readiness of the nation's nuclear power plants should be taken. For all plants, with priority for those plants that have yet to achieve Y2K readiness, the licensee responses to Generic Letter 98-01 and its supplement or a synopsis that provides the Y2K readiness status - including the licensee's stated rational for postponing remediation actions and schedule information for remediation actions - should be placed on our Y2K website. The Y2K website should also include the staff's preliminary assessment of each of the sites that are not fully Y2K ready, using plain language to describe plants (rather than Categories A, B, or C, as described in the attachment to SECY-99-162). Press releases should be issued at appropriate intervals to describe the readiness of plants and the rationale for their remediation schedule.

3. As part of the monthly reports to the Commission on the status of facility readiness for Y2K, the staff should include a summary status of the numbers of plants in Categories A, B, and C as described in Section 4.3 of the policy, as well as the licensee's and the staff's intended actions for each facility that will not be Y2K ready by September 30.

(EDO) (SECY Suspense: 8/31/99)

cc: Chairman Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CIO
CFO
OCA
OIG
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR
DCS

SECY-99-135

May 18, 1999

FOR: The Commissioners
FROM: William D. Travers /s/
Executive Director for Operations
SUBJECT: INTERIM ENFORCEMENT POLICY REGARDING ENFORCEMENT DISCRETION FOR NUCLEAR POWER PLANTS DURING THE YEAR 2000 TRANSITION

Purpose:

To obtain the Commission's approval to revise the NRC Enforcement Policy for nuclear power plants to include an interim policy to exercise enforcement discretion for noncompliance with license conditions, including technical specifications (TSs), during year 2000 (Y2K) transition or rollover periods. In addition, Commission approval is requested for the staff to obtain public comments on the proposed interim policy. This interim policy is submitted in response to the attached staff requirements memorandum (SRM) dated February 19, 1999, and would remain in effect through three Y2K transition or rollover periods (December 31, 1999, through January 3, 2000; February 28, 2000, through March 1, 2000; and December 30, 2000, through January 1, 2001).[(1)]

Background:

The staff has been developing a contingency plan for regulatory response to the Y2K issue in the nuclear industry. As part of this plan, the staff has been considering the approach toward dealing with situations in which a Y2K issue may result in noncompliance with license conditions, including TS requirements. In the SRM dated February 19, 1999, related to COMSECY-98-036 on the draft NRC contingency plan for the Y2K issue in the nuclear industry, the Commission acknowledged that the use of enforcement discretion may be preferable to the use of 10 CFR 50.54(x) when licensees intend to deviate from license conditions, including TSs, in situations arising from Y2K complications that would otherwise require a plant shutdown. The Commission requested the staff obtain stakeholder input on this issue and forward a recommendation to the Commission for review and approval as part of the package accompanying the final contingency plan. The final Y2K contingency plan is being submitted to the Commission separately.

The staff obtained initial stakeholder input (public comments on the draft NRC "Contingency Plan for the Year 2000 Issue in the Nuclear Industry") and considered this input in the preparation of this interim policy. In addition, the staff reviewed proposed Senate Bill S.723, "Y2K Regulatory Amnesty Act of 1999," provided by the Office of Management and Budget to NRC on March 30, 1999, and determined that this interim policy does not conflict with S.723 as currently proposed.

The NRC recently modified its enforcement policy to further address the exercise of enforcement discretion in certain situations to allow continued plant operation when it does not present an undue risk to public health and safety and is in the public interest. Pursuant to the SRM on COMEXM-98-004 issued on July 28, 1998, the NRC's Enforcement Policy (NUREG-1600, Rev. 1) has been revised to allow the staff to exercise enforcement discretion (without consulting the Commission) in cases involving severe weather or other natural phenomena. The staff's determination would be based on balancing the broader impacts on public health and safety or common defense and security of not

operating against the potential radiological or other hazards associated with continued operation, and a determination that safety will be maintained while exercising this discretion. A similar recognition of the broader public interest in a reliable and stable electrical grid during times when there is potential for Y2K-related challenges to the grid provides the basis for this proposed enforcement discretion policy specifically developed for application in Y2K transition or rollover periods. Where an appropriate safety determination can be made, continued plant operation could make a significant contribution to grid stability and reliability, providing necessary reserve power if there are major losses at other generating facilities. Also, requiring an unnecessary plant shutdown could result in an undesirable transient during the licensee's response to a Y2K-related challenge.

Discussion:

The staff proposes to amend the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, Rev. 1, by adding Appendix E to the policy (see attachment). Appendix E describes the interim enforcement policy for exercising enforcement discretion for noncompliance related to Y2K transition or rollover problems. It would be published in the *Federal Register* and become effective 30 days after publication. Comments received within 30 days will be accepted and will be considered prior to the next revision of the Enforcement Policy. Similar to cases involving severe weather, the staff proposes to exercise enforcement discretion without consulting the Commission, but would subsequently inform the Commission of its action.

After becoming effective, Appendix E will remain in effect through January 1, 2001. The policy would apply only during Y2K transition or rollover periods as previously described. During these periods, a licensee may contact the NRC Headquarters Operations Center and seek NRC enforcement discretion with regard to the potential noncompliance with license conditions, including TSs, if a licensee has determined that:

a. Complying with license conditions, including TSs, in a Y2K-related situation would require a plant shutdown; and

b. Continued plant operation is needed to help maintain a reliable and stable grid; and

c. Any decrease in safety as a result of continued plant operation is small (considering both risk and deterministic aspects).

A licensee would be expected to follow the existing guidance as stated in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. A licensee seeking NRC enforcement discretion must provide a written justification, or in circumstances in which good cause is shown, oral justification followed as soon as possible by written justification, which documents the need and safety basis for the request and provides whatever other information the NRC staff deems necessary for making a decision regarding whether the exercise of enforcement discretion is appropriate. The staff may grant enforcement discretion on the basis of balancing the public health and safety or the common defense and security of not operating against potential radiological or other hazards associated with continued operation, and a determination that safety will not be unacceptably affected by exercising the discretion. The Director of the Office of Nuclear Reactor Regulation, or his designee, will advise the licensee that the NRC has approved the licensee's request and will subsequently confirm the exercise of discretion in writing.

Enforcement discretion will only be exercised if the NRC staff is clearly satisfied that the action is consistent with protecting public health and safety and is warranted in the circumstances presented by the licensee.

Consistent with the Agency's "Contingency Plan for the Year 2000 Issue in the Nuclear Industry," the NRC Headquarters Operations Center and the Region IV Incident Response Center will have augmented staff during the Y2K transition. If the volume of requests to the NRC Headquarters Operations Center is such that the NRC staff cannot review and approve all licensee requests in a timely fashion, the NRC staff will obtain the safety-significant information from the licensee to enable the NRC staff to make a prompt initial assessment. Unless the assessment is unfavorable, the licensee would be permitted to proceed with its planned course of action. The NRC staff will complete these assessments as time permits, and the licensee will be advised of the results orally, if possible, and then in writing. If the staff's prompt initial assessment or subsequent assessment determines that a licensee's actions raise safety concerns, the licensee would be so informed. The licensee would then be required to follow its license conditions, including TSs.

Although it is considered highly unlikely, if, upon making reasonable efforts, communication with the NRC staff is not possible, the licensee may make the decision to continue plant operation. If a licensee has opted to continue operations, it must have shown that complying with license conditions, including TSs, in a Y2K-related situation would require plant shutdown, continued plant operation is needed to help maintain a reliable and stable grid, and any decrease in safety would be small. The licensee would be expected to continue in its efforts to contact the NRC as soon as possible to permit the NRC staff to conduct an assessment of the licensee's actions to determine if the exercise of enforcement discretion is warranted.

To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was granted. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification and in those cases in which determinations made by the licensee, and not initially approved by the NRC, were clearly unreasonable considering all the relevant circumstances. The latter provision is consistent with the Commission's view expressed in the final rulemaking for 10 CFR 50.54(x). The NRC does not desire for licensees to hesitate to continue operations, when it is appropriate, out of concern for overly critical after-the-fact NRC reviews. Therefore, the policy statement is clear that it will consider enforcement action only when the NRC concludes that a licensee's actions were clearly unreasonable considering all the relevant circumstances. Enforcement action could include assessment of civil penalties and the issuance of orders.

Resources:

The resources required to implement this interim enforcement policy are included in the resource estimate for the NRC "Contingency Plan for the Year 2000 Issue in the Nuclear Industry," and are included within the offices' approved budgets.

Coordination:

The Office of the General Counsel has no legal objection to this paper. The Office of Enforcement has reviewed this paper and concurs. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections. The Office of the Chief Information Officer has reviewed

this paper and has no information technology or information management concerns.

Recommendation:

The staff recommends that the Commission approve publication of Appendix E to the Enforcement Policy as attached.

Notes:

1. Appendix E to the Enforcement Policy will be published in the *Federal Register* and will become effective 30 days after publication. Comments on this revision will be accepted for 30 days after publication, and will be considered prior to the next revision of the Enforcement Policy.

2. This change does not contain information collection requirements that are subject to the Paperwork Reduction Act.

3. The staff has determined that this is not a "major" rule as defined in the Small Business Regulatory Enforcement Fairness Act of 1996, 5 U.S.C. 804(2).

William D. Travers
Executive Director for Operations

CONTACT: Richard Wessman, NRR
415-3298

Herbert Berkow, NRR
415-1485

Attachments: 1. SRM dated February 19, 1999
2. *Federal Register* notice with draft Appendix E to the Enforcement Policy
[see below]

ATTACHMENT 2

7590-01-P

NUCLEAR REGULATORY COMMISSION

[NUREG-1600, Revision 1]

Policy and Procedure for NRC Enforcement Actions; Draft Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants

During the Year 2000 Transition

AGENCY: Nuclear Regulatory Commission.

ACTION: Draft policy statement.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, Revision 1(Enforcement Policy), by adding Appendix E. This amendment adds an interim enforcement policy that the NRC will follow to exercise enforcement discretion for noncompliance with license conditions, including technical specifications (TSs), because of year 2000 (Y2K) related situations.

DATES: This action is effective [30 days after publication in the *Federal Register*]. Comments on this revision should be submitted within 30 days of publication in the *Federal Register* and will be considered by the NRC prior to the next Enforcement Policy revision.

ADDRESSES: Submit written comments to David L. Meyer, Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mail Stop T-6 D59, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland, between 7:30 a.m. and 4:15 p.m., Federal workdays. Copies of comments received may be examined at the NRC Public Document Room, 2120 L Street, NW, (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Richard Wessman, Deputy Director, Division of Engineering, 301-415-3298 or Herbert Berkow, Director, Project Directorate II, 301-415-1485, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

SUPPLEMENTARY INFORMATION:

- Background
- Scope
- Paperwork Reduction Act Statement
- Public Protection Notification
- GENERAL STATEMENT OF POLICY AND PROCEDURE FOR NRC ENFORCEMENT ACTIONS
- Appendix E: Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition

Background

Y2K-related events arise from a date-related problem that is experienced by a software system, a software application, or a digital device at a key rollover date when the system, application, or device does not perform its intended function. The key rollover dates are January 1, 2000; February 29, 2000 (an uncommon leap day); and December 31, 2000 (the 366th day of an uncommon leap year). The nuclear utility industry is engaged in Y2K readiness programs at all nuclear power plant facilities to seek out and correct Y2K-related problems that have any potential to adversely affect facility operations.

Y2K concerns result from licensees' reliance upon

(1) Software to schedule maintenance and technical specification surveillances;

(2) Programmable logic controllers and other commercial off-the-shelf software and hardware;

(3) Digital process control systems;

(4) Software to support facility operation;

(5) Digital systems for collection of operating data; and

(6) Digital systems to monitor post-accident plant conditions.

It is recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could adversely affect the facility (for example, interruption of communications or partial loss of offsite power).

The electricity production and delivery systems, as two of the more important elements of the North American economic and social infrastructure, must remain dependable during Y2K transition or rollover periods. Most other critical elements of the infrastructure depend on the availability of an interconnected, stable, and reliable supply of electrical power. There is no doubt that cascading or even localized outages of generators and transmission facilities could have serious short-term and long-term consequences.

Continued safe operation of nuclear power plants during Y2K transition or rollover periods will play a major role in maintaining stable and reliable electrical power supply systems, providing necessary reserve power if there are major losses at other generating facilities. The NRC staff is proposing interim staff guidance on the process for the NRC to exercise enforcement discretion in certain situations where power reactor licensees encounter Y2K-associated compliance problems in the Y2K transition period (December 31, 1999, through the first few days of 2000) or in other key rollover periods. The exercise of enforcement discretion may support a licensee decision to keep the plant in operation, if the licensee has determined that safety will not be unacceptably affected, in order to help maintain electrical grid stability and reliability. The NRC Headquarters Operations Center and the NRC Region IV Incident Response Center will be staffed during the key transition from December 31, 1999, to January 1, 2000, to ensure that appropriate actions can be taken for any regulatory issues that arise.

Scope

This proposed interim enforcement policy would provide for the exercise of enforcement discretion to address noncompliance with license conditions, including TSs, because of Y2K transition or rollover issues. The interim enforcement policy would apply to situations in which plant operation is needed to help maintain the stability and reliability of the electrical power supply system, even when license conditions, including TSs, would require a plant shutdown. If such situations occur, licensees would be expected to follow the existing guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion <http://www.nrc.gov/NRC/IM/noed.html> to the maximum extent practicable,

particularly regarding a safety determination and notification of NRC. Licensees may make the decision to continue operations upon making a determination that it is safe and prudent to do so to help maintain electrical grid stability and reliability, and when certain criteria are met. This enforcement discretion extends to situations in which the licensee may be unable to communicate with the NRC. (The staff assessment of telecommunications capability indicates that a loss of all telecommunications between NRC and licensees is highly unlikely.)

To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was used. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision when it is not initially approved by the NRC and in its after-the-fact review, it may not agree in every instance with the licensee's actions. However, consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include the assessment of civil penalties and the issuance of orders.

Paperwork Reduction Act Statement

This interim policy statement does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1995 (44 U.S.C 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval number 3150-0136.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

The NRC is proposing to revise the NRC Enforcement Policy by adding Appendix E to read as follows:

GENERAL STATEMENT OF POLICY AND PROCEDURE FOR NRC ENFORCEMENT ACTIONS

* * * * *

Appendix E: Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition

This appendix sets forth the interim enforcement policy that will govern the exercise of enforcement discretion by the NRC staff when licensees of operating nuclear power plants find it necessary to deviate from license conditions, including technical specifications (TSs), in those cases in which year 2000 (Y2K) related complications would otherwise require a plant shutdown that could adversely affect the stability and reliability of the electrical power grid. This policy extends to situations in which a licensee may be unable to communicate with the NRC, though the staff deems a loss of all communications to be highly unlikely.

The policy is effective [30 days after publication in the *Federal Register*] and will remain in effect through January 1, 2001. This policy only applies during Y2K transition or rollover periods (December 31, 1999, through January 3, 2000; February 28, 2000, through March 1, 2000; and December 30, 2000, through January 1, 2001). During these periods, a licensee may contact the NRC Headquarters Operations Center and seek NRC enforcement discretion with regard to the potential noncompliance with license conditions, including TSs, if the licensee has determined that:

(a) Complying with license conditions, including TSs, in a Y2K-related situation would require a plant shutdown; and

(b) Continued plant operation is needed to help maintain a reliable and stable grid; and

(c) Any decrease in safety as a result of continued plant operation is small (considering both risk and deterministic aspects).

Licensees would be expected to follow the existing guidance as stated in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. A licensee seeking NRC enforcement discretion must provide a written justification, or in circumstances in which good cause is shown, an oral justification followed as soon as possible by written justification. The justification must document the need and safety basis for the request and provide whatever other information the NRC staff needs to make a decision regarding whether the exercise of discretion is appropriate. The NRC staff may grant enforcement discretion on the basis of balancing the public health and safety or common defense and security of not operating against potential radiological or other hazards associated with continued operation, and a determination that safety will not be unacceptably affected by exercising the discretion. The Director of the Office of Nuclear Reactor Regulation, or his designee, will advise the licensee whether the NRC has approved the licensee's request and, if so, will subsequently confirm the exercise of discretion in writing. Enforcement discretion will only be exercised if the NRC staff is clearly satisfied that the action is consistent with protecting public health and safety and is warranted in the circumstances presented by the licensee.

If the volume of requests to the NRC Headquarters Operations Center is such that the NRC staff cannot review and approve all licensee requests in a timely fashion, the NRC staff will obtain the safety-significant information from the licensee to enable the NRC staff to make a prompt initial assessment. Unless the assessment is unfavorable, the licensee would be permitted to proceed with its planned course of action. The NRC staff will complete these assessments as time permits and the licensee will be advised of the results orally, if possible, and then in writing. If the NRC staff's prompt initial assessment or subsequent assessment determines that a licensee's actions raise safety concerns, the licensee would be so informed. The licensee would then be required to follow its license conditions, including TSs.

If there are communications difficulties between the licensee and the NRC, the licensee is encouraged to interact with the NRC inspector onsite who will have a dedicated satellite telephone. The inspector should be able to facilitate communication with the NRC Headquarters Operations Center and/or the NRC Regional Incident Response Centers (IRCs). If communication with the NRC Headquarters Operations Center is not possible, then the licensee should contact the IRC in NRC Region IV to discuss enforcement discretion. Similarly, if the Region IV IRC cannot be reached, then the licensee should

attempt to contact the Region I, II and III IRCs. Although it is considered highly unlikely, if, upon making reasonable efforts by utilizing all these options and communication is still not possible, the licensee may make the decision to continue plant operation. If a licensee opts to continue operation, it must have shown that complying with license conditions, including TSs, in a Y2K-related situation would require plant shutdown, continued plant operation is needed to help maintain a reliable and stable grid, and any decrease in safety would be small. The licensee would be expected to continue in its efforts to contact the NRC as soon as possible to permit the NRC staff to conduct an assessment of the licensee's actions to determine if the exercise of enforcement discretion is warranted as described above.

In conducting its assessments, the licensee should follow, to the extent practicable, the guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion. Contrary to Part 9900 Section B.3 guidance, it is not necessary for an emergency to be declared by a government entity. Licensees are encouraged to contact NRC early in their evaluation process, particularly if time is of the essence, even though complete information as specified in Part 9900 may not be available.

The decision to exercise enforcement discretion does not change the fact that the licensee will be in noncompliance nor does it imply that enforcement discretion is being exercised for any noncompliance that may have led to the noncompliance at issue. To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was granted. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision when it is not initially approved by the NRC and in its after-the-fact review, it may not agree in every instance with the licensee's actions. However, consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include assessment of civil penalties and the issuance of orders.

Dated at Rockville, Maryland, this day of May, 1999.

FOR THE NUCLEAR REGULATORY COMMISSION.

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Annette Vietti-Cook,
Secretary of the Commission.

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1. The extension of the Y2K transition period through Monday, January 3, 2000, is necessary to account for the expected increase in the electrical load at the beginning of the work week; the period of February 28 through March 1, 2000, has been chosen to bracket February 29, an uncommon leap day; and the period of December 30, 2000, through January 1, 2001, has been chosen to bracket December 31, the 366th day of an uncommon leap year.

July 8, 1999

MEMORANDUM William D. Travers
TO: Executive Director for Operations
FROM: Annette Vietti-Cook, Secretary /s/
SUBJECT: STAFF REQUIREMENTS - SECY-99-135 -INTERIM ENFORCEMENT POLICY REGARDING ENFORCEMENT DISCRETION FOR NUCLEAR POWER PLANTS DURING THE YEAR 2000 TRANSITION

The Commission has approved issuance of the interim Enforcement Policy with the following exceptions.

1. The provision that allows a licensee to make the decision to continue plant operation in violation of license conditions when communication with the NRC staff is not possible should be deleted from the Policy.

2. Criterion c. should be revised to add a concurrent requirement which asserts that the licensee has also determined that reasonable assurance of public health and safety, the environment, and security is maintained with the enforcement discretion.

On page 4 of the FRN, paragraph 1, revise line 11 to read ' ... Response Center will have be staffed augmented during the key ....'

Appendix E to the Enforcement Policy should be published in the Federal Register for a 30-day comment period, after which it should become effective.

(EDO) (SECY Suspense: 7/30/99)

The Commission noted that, as described in SECY-99-134, the NRC has developed an extensive contingency plan associated with telecommunications which makes the loss of communications between licensees and the NRC extremely unlikely. In the event that licensees cannot establish communications with NRC headquarters or any of the NRC regional offices through established communications channels, NRC resident inspectors will have satellite communications capability and licensees should avail themselves of this opportunity. If prior NRC approval of requests for enforcement discretion cannot be obtained, licensees should conform to the requirements of their licenses.

cc: Chairman Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CIO
CFO
OCA
OIG
OPA
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR
DCS

June 25, 1999

MEMORANDUM William D. Travers
TO: Executive Director for Operations
William M. Beecher
Director, Office of Public Affairs
FROM: Annette Vietti-Cook, Secretary /s/
SUBJECT: STAFF REQUIREMENTS - SECY-99-134 - AGENCY CONTINGENCY PLANS FOR THE YEAR 2000 COMPUTER PROBLEM IN THE NUCLEAR INDUSTRY

This is to advise you that the Commission has not objected to the final agency contingency plans for dealing with the year 2000 (Y2K) problem in the nuclear industry.

The staff should issue a press release on the availability of this contingency plan and the draft policy statement on enforcement discretion related to Y2K problems (SECY-99-135).

On page v of Attachment 1 to the draft Contingency Plan, last paragraph, line 4, correct the spelling of 'planning.'

cc: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CIO
CFO
OCA
OIG
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR
DCS

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BRIEFING ON Y2K

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland
Thursday, February 11, 1999

The Commission met in open session, pursuant to notice, at 9:06 a.m., Shirley A. Jackson, Chairman, presiding.

COMMISSIONERS PRESENT:

SHIRLEY A. JACKSON, Chairman of the Commission
NILS J. DIAZ, Commissioner
GRETA J. DICUS, Commissioner
EDWARD McGAFFIGAN, JR., Commissioner
JEFFREY S. MERRIFIELD, Commissioner

STAFF PRESENT:

ANNETTE L. VIETTI-COOK, Secretary of the Commission
KAREN D. CYR, General Counsel

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PRESENTERS:

JOHN KOSKINEN, Chair, President's Council on Year 2000 Conversion
FRANK MIRAGLIA, DEDR, NRC Staff
JERRY WERMEIL, NRR, NRC Staff
JOE GIITTER, Incident Response Operations, NRC Staff
JIM DAVIS, NEI
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1 P R O C E E D I N G S

2 [9:06 a.m.]

3 CHAIRMAN JACKSON: Today the Commission meets to
4 receive briefings on the issue of what some have called the
5 millennium bug, most often referred to as the Y-2000 or Y2K
6 problem.
7 With us today are Mr. John Koskinen, Chairman of
8 the President's Council on the Year 2000 Conversion, members
9 of the NRC staff who will be introduced, and representatives
10 from the Nuclear Energy Institute, and Mr. Paul Gunter from
11 the Nuclear Information and Resource Service.
12 As many of you know, the Y2K problem involves the
13 use of a two digit representation of the year element in
14 dates in digital applications, predominantly in computers,
15 but also in embedded microprocessor chips employed in many
16 electronic components.
17 Because the 20th century is only implied by such
18 representations, many of the microprocessor-based systems we
19 rely upon in day-to-day life could experience operational
20 difficulties at the turn of the century due to their
21 inability to recognize and accommodate the change from the
22 year 1999 to the year 2000. For example, the computer may
23 read 00 as the 1900.
24 This problem takes on special significance for the
25 nuclear industry as the unpredictable nature of a given Y2K

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1 failure, if uncorrected, offers the potential for
2 deleterious impact on the performance of reactor plant
3 safety systems; telecommunication systems that the NRC and
4 our licensees depend upon to ensure the ability to respond
5 to events; the electrical distribution systems that provide
6 offsite power to licensed facilities; and the computers used
7 in day-to-day and emergency response activities.
8 On Tuesday of this week I was privileged to
9 provide the keynote address to an international workshop in
10 Canada on the Y2K problem in the nuclear industry sponsored
11 by the OECD Nuclear Energy Agency.
12 It was ironic that as I prepared to inform this
13 international assemblage of the lack of any as yet
14 identified impact of Y2K on U.S. nuclear facilities, the NRC
15 was informed by one U.S. nuclear facility that a plant
16 computer had failed as a result of post-Y2K remediation
17 testing. One could take that as a negative, but one could
18 also take it as a positive since, of course, validation and
19 testing of Y2K remediation is a critical aspect of the
20 overall process.
21 After modifications had been made to remove Y2K
22 vulnerabilities in this case, a test was performed which
23 involved a simulation of the turn of the century. It was
24 during this test that the failure, which lasted for five
25 hours and which rendered the facility's safety parameter

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1 display system inoperable, occurred. I should tell you that
2 there are backups in terms of the enunciators in the nuclear
3 plant, which tells us why defense in depth remains an
4 important concept.
5 The good news is that, first, the problem was
6 identified now, in February of 1999, and second, that it did
7 not affect an active safety system such as the reactor
8 protection system, and third, the plant stayed on line. So
9 these are three important points. I will revisit this event
10 in my closing comment.
11 The NRC has been working aggressively at
12 addressing Y2K vulnerabilities in house, and as of February
13 5, 54 days ahead of the milestone established by the OMB,
14 the NRC has completed the renovation, validation and
15 implementation of all agency mission critical, business
16 essential, and non-critical systems requiring repairs.
17 That's CIO speak. In other words, we have done it all.
18 But there still is work to be done. The NRC
19 contingency planning for dealing with licensee Y2K failures
20 is not yet complete, and analysis, testing, remediation
21 efforts and contingency planning are still under way in the
22 industries we regulate.
23 This morning we will be updated on the status of
24 Y2K activities at the federal level, the activities yet to
25 be completed within the NRC, both in terms of contingency

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1 planning and in terms of developing our regulatory posture
2 with respect to this issue, the activities that have been
3 and still remain to be conducted in the nuclear industry,
4 and public concerns over issues of safety as we confront
5 this issue.
6 The Commission welcomes this opportunity and
7 appreciates the involvement of our guests.
8 Copies of the briefing materials are available at
9 the entrances to the room.
10 I understand that Commissioner Diaz may have to
11 leave early -- and he apologizes -- due to a previous
12 commitment.
13 I want to particularly thank Mr. John Koskinen for
14 joining us this morning and invite him to the table. I'm
15 told that you went over hill and dale to get here, a/k/a
16 Beltway backup. So we thank you for joining us.
17 MR. KOSKINEN: Thank you, Madam Chairman and
18 members of the Commission. I'm delighted to join you this
19 morning and would like to begin by congratulating you for
20 holding this hearing and meeting because, as we will
21 discuss, I think one of the critical aspects of dealing with
22 this problem is public information and keeping the public
23 informed and sharing with them all of the news we have of
24 whatever nature as we go forward.
25 As the Chairman noted, I am chair of the

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1 President's Council on Year 2000 Conversion and I was asked
2 by the President to come back a year ago to deal with this
3 problem. We have created the council as a vehicle for
4 coordinating the federal efforts in this area.
5 The council includes 35 federal agencies,
6 including not only the cabinet agencies, but most of the
7 independent regulatory agencies. So the Federal Reserve
8 Board, the Securities Exchange Commission, and the Nuclear
9 Regulatory Commission are all active members of the
10 President's Council.
11 We have been looking at this problem in three
12 areas.
13 The first area of our activity has been focusing
14 on federal systems which we have direct responsibility for
15 and also direct authority over. As the Chair noted, the
16 President and the Office of Management and Budget have had a
17 goal of completing all remediation of federal systems by
18 March 31, 1999, nine months before we move into the year
19 2000.
20 As of the last OMB quarterly report, through
21 November 61 percent of all of the mission critical systems
22 in the government were totally compliant, meaning they had
23 been remediated, tested and implemented.
24 The next OMB report will be out the first week in
25 March, and we expect then that over 70 percent of the

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1 systems will have been remediated, and by the March 31 goal
2 we expect that probably in the range of 85 percent or more
3 of the systems will be totally done.
4 So the federal government, which faces some of the
5 most significant challenges in the world because we operate
6 some of the largest systems and most complicated systems in
7 the world, I think will basically meet its goals, and as I
8 have stated on other occasions, if there are difficulties
9 for the economy or the public, they will not come from the
10 failure of federal systems.
11 But it was clear to us when we started that even
12 if all of the federal systems are remediated, tested,
13 validated and implemented, that was not going to be enough,
14 because if other systems that we all depend upon
15 domestically or internationally failed we would have
16 significant difficulties. So the major role of the council
17 has been to organize itself into 25 working groups focused
18 on the critical sectors of the economy and their operations.
19 We have working groups with the electric power
20 industry, the oil and gas industry, the transportation
21 industry, the financial services industry, and you can move
22 across the board. We also have a very active working group
23 with state and local governments, and we have an active
24 international working group.
25 Again, I would like to express my appreciation for

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1 the active participation of the Commission and its staff in

2 those working groups, particularly the electric power group.
3 We have been reaching out in all of these working groups to
4 form a cooperative working relationship with the major
5 industry associations or umbrella groups in those areas.
6 In many of these areas we are dealing with
7 organizations over whom we have no direct oversight or
8 regulatory authority but are in fact trying to work with
9 together with them to find out what we can all do to both
10 increase the level of awareness in each of those critical
11 sectors and activities, and more recently, to provide
12 national assessments of the state of readiness, so that in
13 each of the working groups the trade associations, umbrella
14 groups or organizations like the National Governors'
15 Association have been surveying their members under the
16 auspices of the Information Disclosure Act which the
17 Congress passed for us last year, which protects those
18 surveys in terms of the confidentiality of the information
19 provided, and we are sharing that information with the
20 public as it is provided to us.
21 About three weeks ago the North American Electric
22 Reliability Council, which has been, of course, the umbrella
23 group for us for electric power, released its second survey.
24 We expect next week, on the 18th of February, to get the
25 second assessment from the oil and gas industry. Those two
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1 surveys are in their second cycle because we started with
2 them first because of the critical nature of them in terms
3 of their impact.
4 Thus far, as noted, there are no indications that
5 there will be massive failures or national failures in
6 either the electric power area or in the oil and gas area,
7 but I would stress that does not mean that there is not a
8 substantial amount of work to be done, and I would also
9 stress that, as those surveys show, not every company is at
10 the same level of preparedness.
11 I was accused when I was at OMB of viewing all of
12 life as a bell-shaped curve with some people at one end and
13 at the other and everybody else flailing away in the middle.
14 Clearly those surveys reveal that.
15 The NERC survey has now over 96 percent of the
16 industry, 3,000 companies, participating to some extent
17 because they listed everybody who participated and nobody
18 wanted to be on the list as a non-participant. But they
19 noted in their first survey and in their second survey that
20 there are companies that are behind the curve, as it were,
21 and need to increase the level of activity.
22 To their credit, NERC pursued those who said that
23 they were not going to meet the June goal of the North
24 American Electric Reliability Council to be done to
25 determine exactly what their problems were.
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1 They have promised in their next survey they will
2 distinguish between those companies that have an

3 understandable reason for not meeting the goal, which could
4 be that they will wait until they have a time in their
5 normal operations where they can shut down and do the final
6 testing or the final implementation, and distinguish those
7 organizations from the ones that in fact simply are not
8 making enough progress.
9 Our goal in all of this in terms of the surveys,
10 whether they are of counties or cities or power companies,
11 has been, first, to give us all information upon which we
12 can base our own contingency planning and emergency
13 response.
14 Secondly, to share information with the public
15 about the state of preparedness so that everyone will have
16 the information we do.
17 And thirdly, to begin to set benchmarks for the
18 industry so that companies as that information is provided
19 and they can look at where the average company is will know
20 whether they are ahead or behind in the game. It's a way of
21 in fact encouraging and increasing the level of activity as
22 we go.
23 Our concerns domestically by and large are not the
24 companies that are focused on this problem. They are really
25 the organizations that are not focused on it, that have
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1 decided for one reason or another that this is not their
2 problem. Either they are not running major mainframe
3 operations and therefore have ignored the implications and
4 the impact on day-to-day operations with embedded chips and
5 other challenges, or they have decided they are going to
6 wait and see what breaks and then they'll fix it. Many of
7 these organizations are small or medium sized organizations,
8 although some of those organizations of that size have done
9 very well.
10 We have tried to stress, whether they are cities
11 and counties or small power companies or telephone
12 companies, that it's a high roll risk of the dice, because
13 if they wait and things do not work, they are likely to find
14 themselves at the end of a very long line of people who
15 waited to see if things broke and then tried to get them
16 fixed.
17 We are continuing to push in a wide range of
18 activities to try to get people to pay attention to this
19 issue and understand that what they all need to do is make
20 an appropriate assessment.
21 Part of the difficulty is that everything will not
22 fail, and in fact many things will not be affected by the
23 problem. So it's not simply a question of telling people to
24 replace everything or buy upgrades or patches. In fact, for
25 smaller organizations, they don't have the resources to do
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1 that. So it's critical for them not to be sold a bill of
2 goods, as it were.
3 On the other hand, there is no way to know until

4 you've made an assessment and compared notes with others.
5 Our other concern is internationally. Probably
6 half the countries in the world have not taken any
7 significant action in this area. We have been working with
8 the United Nations and other organizations.
9 In December we obtained the agreement of the
10 United Nations to invite countries to send their year 2000
11 coordinators or senior executives to meet with us, and in
12 mid-December we had the senior year 2000 people from 120
13 countries meet with us at the United Nations.
14 Last Friday, in response to requests from that
15 meeting, we announced in New York at the Foreign Press
16 Center the formation of the International Y2K Cooperation
17 Center, which will be the first coordinating group to in
18 fact coordinate the activities going on around the world.
19 The delegates, in December, agreed to go back into
20 their regions and work on a regional basis on cross-border
21 issues, but we are still concerned about the lack of
22 activity in some countries, and we are also concerned about
23 the lack of activity in some sectors.
24 Significant amounts of international activity have
25 gone on in the financial area, led by central bankers and
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1 market regulators like the Securities Exchange Commission.
2 Significant work has gone on in
3 telecommunications.
4 Some work has gone on, and it's at an increasing
5 level, in air traffic.
6 But there is relatively little work in an
7 organized way in the power area. We are working with the
8 International Atomic Energy Agency to try to increase the
9 level of their activity, but as you know, it's a very small
10 organization and this is a unique challenge for them.
11 As a result of our concern about the lack of
12 activity in an organized way in shipping, under the
13 leadership of the U.S. Coast Guard there will be an ad hoc
14 meeting of all the major international shipping
15 organizations in the first week of March in London to try to
16 mount the same global effort in the shipping area that we
17 have in finance and telecommunications.
18 Our concern there, of course, is that we depend
19 upon receiving goods by maritime shipping in a wide range of
20 areas, including in the energy area. So our problem is not
21 that we know there are going to be failures; our problem is
22 we do not have information.
23 That brings me to my request of the Commission and
24 the staff and the industry. That is that our other major
25 problem and risk in the United States will be overreaction
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1 by the public to the perception of what this problem could
2 look like.
3 We are concerned that if a few people decide to
4 change their economic behavior, it won't make a lot of

5 difference, if even a reasonable number of people do that,
6 but if 200 million Americans decide to do anything very
7 differently all at one time, the system is not geared up to
8 deal with that, and we could have a self-fulfilling prophesy
9 where we have a major economic problem even though the
10 systems basically are functioning appropriately.
11 Our goal in this area is not to lead people at the
12 other end of the spectrum into any false sense of security.
13 I feel we have an obligation to be candid with them, to in
14 fact share all the information we have, whether it's
15 difficult or positive, and that we need to give them advice
16 as to how to prepare accurately and adequately.
17 As we are doing national surveys, those are, I
18 think, reassuring. As the information continues to evolve
19 that, for instance, there is no indication yet that there
20 will be any failure of the power grids, that is reassuring
21 to people, but on the other hand, everybody wants to know
22 what is going to be the situation with their own power
23 company, what's going to be the situation in their community
24 with water treatment, with telecommunications facilities.
25 We are working from our end, but we would be

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1 delighted to have support across the board to encourage
2 individual companies to begin to engage in a dialogue with
3 their customers and their communities about their state of
4 preparedness.
5 At this point there is a lot of what I fondly
6 refer to as crummy legal advice being given to these
7 companies that the best thing to do is not say anything, and
8 there could not be worse advice in terms of the operation of
9 a company that the public depends upon.
10 I think the public has a lot of common sense. I
11 think if they are given the appropriate information, they
12 will respond appropriately. I think by now most of them
13 understand this is a complicated challenge, that it's not an
14 expectation that people should be done today. So companies
15 who are waiting until they are totally done and there is no
16 issue before they say anything may wait for a very long time
17 because, of course, in the circumstance there is no way to
18 guarantee, in light of the unique nature of the problem,
19 that everything will work perfectly.
20 I think what people will understand and what they
21 need to know is that each company understands that this is a
22 problem, that the senior leadership, including the chief
23 executive officer, has this on their list of priorities,
24 that they are managing against the problem, that they have a
25 plan, that they will announce and provide information about

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1 when they will be done, and they have backup plans that they
2 are prepared to deal with, and work-arounds.
3 One of the things that is important for people to
4 understand, and it goes to the example of the Chairman, is
5 that this is not an all or nothing proposition. It is not a

6 question of either the systems work or everything stops. In
7 fact, with appropriate planning and appropriate backup plans
8 and contingency plans or continuity of operation plans,
9 there are work-arounds that are implemented every day for
10 software or other kinds of failures, and most of the
11 problems the public never sees. But all of that needs to be
12 explained to the public.
13 As I say, we are, through the spring, going to be
14 encouraging companies across the spectrum to deal with their
15 communities. We need in a community every head of a banking
16 organization, of the power company, of the telephone
17 company, of the local government to be explaining to the
18 public exactly where they are. If they are moving more
19 slowly than they would like, they need to explain that. I
20 think the public will understand that.
21 The risk is that if we keep the information to
22 ourselves, even if it's positive information, people will
23 inevitably assume the worst; there will be a void of
24 information; and the great risk that people will
25 unnecessarily overreact to their perception of the problem.
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1 Again, the Commission has been a great leader in
2 this area. I applaud your announcement earlier this week
3 that you are now totally completed with your own internal
4 system upgrades and testing and validation, but I also
5 applaud your focus on the fact that, as we advise all of the
6 federal agencies and in fact all the companies we are
7 dealing with, everybody needs to take a look at their
8 contingency plans and their backup plans even though you've
9 done all the work on your systems as we go forward.
10 It's an interesting challenge in the next 323 days
11 that we all face, but it's clear to me that if we work
12 together on it, if we are in fact transparent in the efforts
13 in which we are engaged, that we will make the transition
14 successfully, and as the President said in the State of
15 Union message, the year 2000 problem will be the last
16 headache of the 20th century rather than the first crisis of
17 the 21st.
18 CHAIRMAN JACKSON: Mr. Koskinen, let me ask you a
19 couple of questions. Going back to the recently published
20 NERC report, in a way the report seemed at once both
21 optimistic and cautious. One area of caution had to do with
22 the reliability of telecommunications, given the impact it
23 could have on grid management.
24 Do you have an opinion on the degree of confidence
25 that we should have that we won't see multiple challenges to
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1 generating stations, including nuclear plants, because of
2 losses of offsite power? To put it another way, does the
3 telecommunication sector seem well in hand?
4 I have a point of view that they are what I call
5 the fundamental infrastructures, and if you don't have any
6 electrical power, then everything goes out the window.

7 MR. KOSKINEN: That's right. There is a symbiotic
8 relationship. The telephone companies will all tell you
9 that they can't function without power; the power companies
10 will tell you they can't function without
11 telecommunications; and they all also depend on oil and gas
12 supplies. So it is in fact a mutual dependency society.
13 There was a meeting of the three working groups of
14 the council on telecommunications, oil and gas, and electric
15 power at the end of last month in Texas to begin to try to
16 again increase the flow of information. Part of the problem
17 is we have an information flow problem not between just
18 companies and the public, but between companies and their
19 suppliers and those they rely upon.
20 Under the leadership of the Federal Communications
21 Commission we have reconstituted the National Reliability
22 and Interoperability Council, or NRIC as it's called, headed
23 by the chief executive officer of AT&T;. They are committed
24 to providing us a full industry survey before our next
25 report to the public, which will be in mid-April.

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1 At this juncture it is clear, and has been since
2 we started, that the major telecommunication companies, both
3 internationally as well as domestically, are vigorously
4 engaged in dealing with this problem. It's also clear that
5 they have some of the greatest challenges of any industry,
6 in particular because it's very difficult for them to do
7 testing because you can't take the network down to test it.
8 So they have set up very complicated testing labs and they
9 are sharing information as they go forward.
10 At this juncture, I think we are increasingly
11 comfortable that the major companies and the major systems
12 will work. On the other hand, there are 1,400 smaller
13 telephone companies.
14 As you all know, from the power side we deliver,
15 the Rural Utility Service of the Agriculture Department
16 tells me, 20 percent of all utility services to rural areas.
17 It will be very helpful to have Sprint and GTE and AT&T;
18 prepared and ready to deal with this problem. The question,
19 though, is, if you are in a smaller town or in a rural area,
20 will your local telephone company be ready?
21 In the NERC surveys they've got virtually every
22 power company participating. We are working actively with
23 the telecommunications industry to try to have them have the
24 same reach, because I think our risk is not national. There
25 is a substantial amount of work going on. I think our risk

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1 is local, particularly in the small areas.
2 Corollary to that is the National Association of
3 Counties did a survey for us, which you may have seen, in
4 December, which on the one hand 50 percent of the counties
5 have a major clear plan. The problem on the other side of
6 the coin is 50 percent do not.
7 The Conference of Mayors released their survey a

8 couple of weeks ago in which they listed everybody who
9 participated and showed the usual spread of active
10 participation, but there were major cities that did not
11 participate. New York City and Los Angeles did not
12 participate in that survey, and they are large cities. And
13 they did not reach out and could not reach out obviously to
14 the thousands of smaller towns.
15 So we are basically again saying that there needs
16 to be a dialogue. People at the local level have a right to
17 expect that their city manager, their mayor, their county
18 executive will begin to, if they have not already, explain
19 to them exactly where they are and share information about
20 it, because that's where the risk is.
21 Montgomery County has been the leader in the
22 United States about not only engaging in a dialogue, but
23 sharing information about what they've done to remediate
24 their systems and what their test programs are. Our goal is
25 to have every county in the United States emulate that

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1 process.
2 The bottom line is I think that the major
3 infrastructures, it appears, will be in good shape, but our
4 problem and our focus is on individual companies and
5 individual locations.
6 CHAIRMAN JACKSON: You indicated that you were
7 making a request to the Commission, and I take it that it
8 had to do with our having discussions with the CEOs of the
9 companies we regulate in terms of being open, engaging in
10 dialogue, et cetera. Do you feel that there is a direct
11 educational role that entities like the NRC have?
12 For instance, our regional administrators do hold
13 quarterly press briefings. The question is, do you feel
14 that there is some opportunity that we should take? Not
15 that we have total control in terms of any remediation, but
16 in the sense of educating the public, do you think that is
17 an appropriate thing for us to do?
18 MR. KOSKINEN: Yes. That's a wonderful question.
19 It is clear to us as we deal with the public, even
20 internationally, that the one word that resonates in the
21 public minds is "nuclear." I continue to be asked about the
22 safety of nuclear weapons systems not only in the United
23 States but around the world, and there is a great focus on
24 the safety and the operation of nuclear power plants.
25 Those who have a broader understanding understand

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1 that we depend upon nuclear power plants not just for safe
2 operation but actually as a major participant in the supply
3 of energy. But it is clear that if we are going to have
4 people unnecessarily concerned, it's going to be if they
5 unnecessarily assume there are safety risks and problems.
6 Going back to your example about the testing
7 failure in the year 2000 test you gave, it strikes me that
8 that is the kind of information that we need to have public.

9 As you say, the good news about that is that people have
10 done the work, they are testing it, and if there are
11 problems, they are going to discover them now, and if there
12 are problems, they are in fact not problems that would shut
13 a plant down forever, that they can be remediated.
14 I think there is a major role of education and
15 information exchange to be played by the Commission
16 nationally and regionally, and I think we need to encourage
17 the companies individually to publicly discuss with their
18 customers exactly what they've done, where they are in the
19 process, what work remains to be done, what their challenges
20 are, and I think we need to have the testing process be as
21 visible as it can be. The most important way to reassure
22 the public is to in fact share the testing process, and when
23 we have a problem, that's not a major difficulty for the
24 public to understand; it is in fact reassuring.
25 The Defense Department got great publicity when

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1 they opened their test at the White Sands Proving Grounds to
2 the press. If it had not all gone well, that would have
3 been very visible. The fact that they were willing to do
4 that and in fact that it worked sent a very positive message
5 out to the public. We need to do that, and I think we need
6 to do that even if we are unsure what the tests will show.
7 If the public feels that we will share the information with
8 them, whether it's positive or negative, they will then both
9 have increasing confidence in the process and I think they
10 will feel that they know and will be able to make the right
11 choices.
12 CHAIRMAN JACKSON: Has there been a discernible
13 impact of the Year 2000 Information and Readiness Disclosure
14 Act in terms of entities?
15 MR. KOSKINEN: We developed that Act in response
16 to particularly the telecommunication industry and the
17 securities industry saying that they could not exchange
18 information with each other because their lawyers said if
19 they were not 100 percent right they could be sued. So the
20 Act basically protects all voluntary disclosure, including
21 statements of readiness even if they are not 100 percent
22 accurate, as long as you are not knowingly misleading people
23 or lying about it.
24 It has helped significantly in our survey results.
25 There is a special data gathering request section that says

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1 that if a company provides the data to a trade organization
2 or an umbrella organization like NERC, litigants can't reach
3 into NERC and in effect have one-stop shopping for the data.
4 So it is protected from litigants; it's protected from the
5 federal government for regulatory purposes. So we have been
6 able to increase the participation in those surveys.
7 There has been a slower increase than we would
8 like -- again, we are working on it -- of technical
9 information. One of the goals we had in that legislation

10 was for larger companies or companies further ahead in the
11 process to share their technical information about their
12 experience with products, their experience with where the
13 problems were, and their fixes and their testing protocols.
14 There has been some of that but not nearly as much of it as
15 we would like.
16 It's important for companies to share that with
17 each other as they are working through the process. It's
18 most important, though, to have that information available
19 for the smaller companies and the medium size companies who
20 do not have the same technical resources.
21 Especially as we begin to run out of time here and
22 abroad, whether they are telephone companies, water
23 treatment companies, power companies, hospital companies,
24 and hospitals, we need to, if we can do it, have access to
25 technical information from others in their industry that
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1 they can take advantage of, because you can cut through a
2 lot of the time if you have a pretty good idea of what the
3 systems are you should be focusing on and what the fixes are
4 for those systems.
5 We are continuing to push. I've been disappointed
6 to that extent in the lack of information sharing by some
7 industries, by some companies. A major message that would
8 be helpful is that to the extent that the more advanced and
9 sophisticated companies can make that information available
10 through the Web sites or otherwise, it will be critical
11 information to smaller organizations as we move through this
12 year.
13 CHAIRMAN JACKSON: Commissioner McGaffigan.
14 COMMISSIONER McGAFFIGAN: Just one question. Y2K
15 is not a single date; it's a whole series of dates, as you
16 know. We passed one of them, 1/99. I know from reading The
17 Washington Post that HP had some problems with old
18 defibrillators, which got fixed; Blue Cross-Blue Shield had
19 some problems with its pharmacy services, which got fixed.
20 We had some heightened readiness here consistent with our
21 contingency plan. As that night rolled through, I watched
22 CNN to see if any problems had occurred in Japan or Europe,
23 and the staff did something more systematic.
24 I think the next one is 4/9/99, the 99th day of
25 this year, and 9/9/99. I forget what the others are. Is
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1 there a dialogue as those dates get passed about what
2 problems we found, in which sectors, and how they were
3 handled? That might be a way to build some confidence.
4 MR. KOSKINEN: It's a very important point. It
5 turns out the press and all of us monitored what happened.
6 We have now, thanks to this meeting, a list server so I can
7 reach about 130 countries' senior year 2000 executives by
8 the push of a button. There were probably ten or 12 or 15
9 incidents in the world, which means that the vast majority
10 of systems passed the 1/1/99 date without a problem. There

11 was some visibility to that.
12 Although I think you are right the first date most
13 people are really focused on is April 9, because that will
14 be the 99th day, the real date that everybody has known from
15 the start is September 9th, because that will be 9/9/99.
16 We need to provide visibility to that both in
17 terms of what the difficulties are and what works. With the
18 difficulties, it will be important for people to understand
19 how did we deal with those.
20 An interesting event along those lines was last
21 week for air traffic. The airlines historically do not book
22 farther than 330 days ahead. Last Thursday was the first
23 day that you could book an airline reservation into the year
24 2000. Everybody watched, and it turned out all of those
25 systems worked fine except for one airline, which in fact
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1 had not scheduled itself to be able to deal with that. The
2 other major airlines and the major reservation systems
3 passed that deadline.
4 In fact there was some coverage about it. The
5 good news doesn't travel as fast as the bad news. So it was
6 not as easy for us to get that out.
7 I think your point is well taken, first, that we
8 should be aware of those dates; secondly, they are going to
9 occur as we go through the year; and thirdly, we need to see
10 how people deal with them. Everyone dealing with a fiscal
11 year that starts before the end of the year obviously will
12 have to have financial systems capable of dealing with
13 fiscal year 2000 as we go forward.
14 We think that the 9/9/99 or the 99 phenomenon has
15 been certainly well known and visible for the last year and
16 a half or two, so that people who are remediating systems
17 are using those as test dates for themselves.
18 I think ultimately if we get through, as I think
19 we will, 9/9/99, that should provide reassurance to the
20 public. What we are encouraging people, and it is critical,
21 if there are problems, we should have those be visible as
22 well, because then I think we will have greater credibility.
23 CHAIRMAN JACKSON: Who is dealing with the GPS
24 system?
25 MR. KOSKINEN: The GPS system, for those who have
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1 haven't followed the bouncing ball, is August 21, 1999, in
2 which the global positioning system satellites will roll
3 over. They keep track of weeks, and they'll go back to week
4 zero. That is run by the air force and the Defense
5 Department as well as others. Those satellites will be
6 fine. Satellites generally turn out to be fine because they
7 are basically just antennas floating around the world. The
8 issues are in the ground stations that provide information.
9 At this juncture, therefore, the basic GPS system
10 will be sound. The challenge and the concern is everybody
11 who reads off that system, because they have to make sure

12 that their systems also roll over to week zero so they read
13 it appropriately. Otherwise they will be in trouble. There
14 has been a major push through various commercial and
15 non-commercial networks to get people up to speed.
16 Our real concern are people who have bought
17 recently, but not recently enough, personal GPS readers. We
18 are concerned about people who are out sailing or out hiking
19 in the mountains who may have in fact an older system that
20 doesn't roll over and they will no longer be able to get an
21 accurate reading. We are doing whatever we can, but I think
22 basically it will be another date. It's not a year 2000
23 problem per se, but it's a similar problem because you are
24 changing the way the system calculates.
25 CHAIRMAN JACKSON: That's right. It's a delta
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1 system.
2 MR. KOSKINEN: Right.
3 CHAIRMAN JACKSON: Commissioner.
4 COMMISSIONER MERRIFIELD: I have a couple of
5 comments and a couple of questions. First, I want to
6 express my thanks for your coming out and sharing your time
7 with us. It's very helpful for our deliberations to get
8 that kind of interaction and comment.
9 We are very pleased here about what we have done
10 at the NRC for our compliance issues. I personally want to
11 express my thanks to Tony Galante and his folks for doing a
12 crack job. The fact that we are among the first is
13 something that we have to be very proud of. I'm glad we
14 could share that today as well.
15 We will be hearing later on from NIRS. We've
16 heard from others who do have concerns about these nuclear
17 power plants being ready, being compliant for the Y2K issue.
18 I understand your concern, and I share it, that we
19 need to have an interaction with the plants that we regulate
20 to make sure that not only are they doing the right thing,
21 but they are also communicating that they are doing the
22 right thing.
23 I've only been a Commissioner for about 13 weeks
24 now, and I've had an opportunity to meet dozens of CEOs over
25 the course of the last few months. One of the main topics
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1 that we have talked about has been the Y2K issue. Uniformly
2 there has been a commitment of those CEOs that they are
3 taking the actions necessary to be ready for those date
4 turnovers as we look at them. Similarly, the Nuclear Energy
5 Institute has also been doing a lot of work. They've
6 explained a lot of the work that they have been doing to be
7 ready as well.
8 I think there is an issue of communication there.
9 I don't think they are doing enough and perhaps we aren't
10 doing enough to assure the public that we are indeed taking
11 this very seriously.
12 You see the commercials on the cable television

13 shows: buy your six months of food supply; make sure you
14 have emergency generating facilities. There are a lot of
15 charlatans out there who are going to try to make a fast
16 buck out of this whole concern. I think we need to do what
17 we can to assure the public that we are serious about this.
18 In addition to our own internal procedures, we
19 have touched a little bit on making sure that we have
20 contingency plans. We had a vote on a contingency plan for
21 the NRC within the course of the last two months. I think
22 all of the Commissioners took that very seriously to make
23 sure that we are indeed ready for that as a Commission as
24 well when that turnover takes place.
25 I think it is very good that we have had this
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1 dialogue today and hopefully we can continue it.
2 My two questions are this. The first one is, in
3 order to gauge how the plants are doing we conducted an
4 audit of 12 facilities and the results of those were
5 positive that they were doing the activities necessary to be
6 ready for the year 2000. Of the 103 plants we have out
7 there now, we sampled 12 licensees, but that covered --
8 CHAIRMAN JACKSON: Over 20 reactors.
9 COMMISSIONER MERRIFIELD: I was going to say that.
10 It covered over 20 reactors.
11 I guess my question for you is, is that type of an
12 audit process that doesn't sample the entirety of the plants
13 that we regulate a procedure that you believe would be
14 appropriate, or should we be doing more in that regard?
15 MR. KOSKINEN: It's a difficult question. To the
16 extent that the 20 reactors cover the basic systems so that
17 you now in effect have audits that the fixes are known for
18 the 103 plants out there, I think that is very helpful.
19 We have urged and encouraged the federal agencies
20 to have independent verification and validation of their
21 work. So whether it's done by the Commission or whether
22 companies have their own contractors or others doing it, I
23 think it is important to recognize that companies when they
24 assert and provide information that they are compliant need
25 to advise the public and us not only what they did, but how
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1 they tested it and what their verification and validation of
2 that was.
3 What we all need to recognize -- and the
4 companies, I think most of them do -- is this is a unique
5 challenge. We have never confronted anything as
6 all-encompassing as this before. You never know and we'll
7 never know until we actually cross those dates that it all
8 has worked perfectly. So you can't test too much, and it's
9 very important to make sure that there is an independent
10 validation, particularly in an area like nuclear plants.
11 My sense would be that one way or the other in the
12 area of communication companies need to establish either the
13 Commission has provided an independent verification or they

14 otherwise have some independent verification that the work
15 that they have done is appropriate, that the tests they've
16 run in fact have been run and are appropriate.
17 As we have said with the federal government, it's
18 not a question of finding people who are cheating or cutting
19 corners; it's really a question of just making sure that we
20 have gone through and looked at all the processes jointly,
21 in a cooperative way to make sure that the work has been
22 done and been done accurately.
23 Correlated to that is the information sharing. It
24 would be very helpful to the extent that companies share
25 testing protocols and information with each other. As the
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1 oil and gas industry, we have 25 trade organizations, major
2 umbrella organizations. Their position is this is not a
3 competitive issue, that nobody is very interested in having
4 somebody create a major problem in these systems. So they
5 are increasingly beginning to share information.
6 The nuclear power industry, it seems to me, is a
7 wonderful area for potential cooperation, for people to
8 compare notes about what their testing protocols were and
9 where they found difficulties or what their fixes were,
10 because if you are a company and you've done a certain set
11 of tests, it's very helpful to know somebody else has tested
12 the same systems in a different way and come out with the
13 same answer. If they come out with different answers, that
14 is also critical information, and the only way you will know
15 that is in fact if you can get that information shared.
16 I'm dealing 90 percent of my time with people who
17 don't have to listen to what we tell them, but we've been
18 able to generate a cooperative response, and I think there
19 is a large area of very important potential cooperation
20 among the plants themselves. Not only cooperating with you
21 all, but cooperating among themselves in terms of sharing
22 information.
23 CHAIRMAN JACKSON: Let me interject something. I
24 think it's important that you not be put in a position of
25 answering a question out of context. It is true that the
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1 NRC has audited 12 licensees, and they represent different
2 regions, which means they are part of different grids, they
3 represent different types of reactors, different size of
4 licensees; some are larger, some are smaller; therefore some
5 have more resources, et cetera.
6 Coming out of that there will be a review of six
7 additional licensees specifically focusing on contingency
8 planning. But all of this is occurring within a larger
9 context having to do with now a three-year-old effort that
10 the NRC has been carrying out in conjunction with the
11 Nuclear Energy Institute. We have Mr. Jim Davis here today
12 who is going to be talking with the Commission about that.
13 Therefore, in a certain sense it's unfair to ask you the
14 question without your having the context of an overall

15 effort.
16 I think Mr. Davis will talk with us -- I know you
17 are a very busy man, but we will be happy to send you the
18 relevant parts of the transcripts -- about the degree of
19 cooperation within the industry and what kinds of
20 information is being shared. It's an important issue, but
21 it's an important issue that, in the sense of your statement
22 about not panicking the public, people understand the
23 context.
24 MR. KOSKINEN: I think that's right.
25 COMMISSIONER MERRIFIELD: The Chairman has more
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1 artfully and articulately been able to put that in context.
2 I appreciate her having done that.
3 The other question I had for you. Different
4 countries have dealt with this issue relative to their power
5 plants in different ways.
6 In Sweden, we had a report they decided to turn
7 all the dates forward to the year 2000 date and see what
8 happened. There were some results that happened from that.
9 There was also a test in Nova Scotia where they
10 artificially decided to turn it to beyond 2000. This is not
11 for their nuclear power plants but for some of their
12 conventional generating facilities. They are now somewhere
13 in May of 2000 and they have not had any problems.
14 Do you have any thoughts about different
15 activities by other countries in the context of how they are
16 addressing this with power generating facilities?
17 MR. KOSKINEN: Again, to the credit of the
18 Commission and the industry, I think we are farther ahead
19 and in a more systematic way dealing with this problem than
20 certainly some of the countries which do not have the same
21 events.
22 I've seen the article about the Canadian plant,
23 which is, as you say, running months into the year 2000,
24 which again is something that would be useful if more people
25 understood that in fact there are people out there who have
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1 met the challenge, rolled it forward and done well with it.
2 It goes back to my point about industry cooperation and
3 sharing. There are a lot of different ways to test and deal
4 with systems.
5 It would be helpful if we could in fact get more
6 information shared among the companies about different ways
7 they are dealing with it and what the results are. If you
8 come at it in three or four different ways and you get the
9 same result, you increase significantly, obviously, your
10 level of confidence that the basic underlying fixes are
11 working.
12 Our bigger concern internationally is not the
13 people who are at a stage where they can roll the clocks
14 forward and test successfully; our bigger concerns are
15 places in areas such as those countries running Russian

16 designed nuclear plants where it's not clear that there are
17 appropriate resources and attention being paid. That is why
18 we have spent a lot of time working with the International
19 Atomic Energy Agency, because I think there we have more
20 significant challenges.
21 CHAIRMAN JACKSON: You know that the U.S.
22 Government is supplying a cost-free expert that we helped to
23 identify to help with that effort.
24 MR. KOSKINEN: Yes.
25 CHAIRMAN JACKSON: It's not enough, but it is a
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1 beginning.
2 MR. KOSKINEN: Morgan Libby has been provided on a
3 cost-free basis from the United States to the IAEA. They
4 are using a lot of the materials that you all and the
5 industry have generated here as basically course materials,
6 trying to educate and share that information through those.
7 I think it is 66 plants that run across nine different
8 countries, the newly independent states and in Russia.
9 It's a classic example of the sharing of
10 information and the value of it, because if that information
11 had to be developed from scratch, they'd never be able to do
12 it. So we are transporting our experience and expertise to
13 the extent we can. As the Chairman notes, we need to do
14 more of that.
15 COMMISSIONER MERRIFIELD: Thank you.
16 CHAIRMAN JACKSON: Thank you very much,
17 Mr. Koskinen. We appreciate your coming out. I know you
18 spend a lot of your time doing this. It is very helpful to
19 us.
20 MR. KOSKINEN: It's my pleasure. Again, I would
21 commend all of you and the Commission and the industry for
22 the work you are doing and the leadership you are providing
23 in an area the public is greatly focused on and interested
24 in. Good luck.
25 CHAIRMAN JACKSON: We don't mind if you take away
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1 the message that we do have the best CIO in the government.
2 [Laughter.]
3 CHAIRMAN JACKSON: Thanks very much.
4 I would like to invite the NRC staff and Mr. Davis
5 from NEI to come forward to give us an update on the status
6 of nuclear utility readiness in this area. I'm going to ask
7 Mr. Miraglia to begin.
8 MR. MIRAGLIA: Thank you, Madam Chairman. Good
9 morning, Commissioners.
10 The staff has been aggressively addressing the
11 year 2000 problem with our licensees and preparing the
12 agency to deal with unanticipated issues that may result
13 from the Y2K problem.
14 Over the past couple of years the staff has worked
15 to ensure that our licensees are aware of the 2000 problem,
16 and as you are aware, we provided an appropriate level of

17 regulatory oversight.
18 As has been mentioned, there are 323 days to the
19 turn of the millennium. We believe that the efforts that we
20 have under way and are yet to complete will provide
21 continued reasonable assurance of the protection of the
22 public health and safety during the transition to the year
23 2000.
24 We have broken in some respects the panel at the
25 table today, because we also have sitting with the staff

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1 industry. We recognize our regulatory role in terms of
2 arm's length relationship with the industry, but this has
3 been a very cooperative effort, as the Chairman has
4 articulated in some of her remarks, and even as you heard
5 from Mr. Koskinen on the involvement of the industry with
6 us.
7 We've also worked over the past ten months within
8 the President's Council. I as a member of that council
9 would also like to express my appreciation to Mr. Koskinen
10 for taking the time to be with us today to support this
11 Commission meeting.
12 CHAIRMAN JACKSON: He's asked for a transcript, so
13 he'll know that you said that.
14 MR. MIRAGLIA: I'll see him this afternoon at a
15 council meeting.
16 With me today is Jim Davis from the Nuclear Energy
17 Institute. Staff with me is Jerry Wermeil from the Office
18 of Nuclear Reactor Regulation and Joe Giitter from the
19 incident response organization.
20 CHAIRMAN JACKSON: By the way, if I may just take
21 a moment to interject. I'd like to take note of the fact
22 that Mr. Wermeil is going to be moving and taking over the
23 reactor systems branch. As some have said, from the frying
24 pan into the fire. Nonetheless, I want to take this
25 opportunity to thank you publicly for all the work you've

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1 been doing. I know we've had a number of sessions, and it's
2 a difficult issue to get your hands around.
3 MR. WERMEIL: Thank you very much, Chairman
4 Jackson.
5 MR. MIRAGLIA: I appreciate those remarks, Madam
6 Chairman. The matter of transition is under review by me.
7 [Laughter.]
8 CHAIRMAN JACKSON: I see. So this may be
9 premature.
10 MR. MIRAGLIA: No. It has to be done, but it
11 needs to be done in an orderly and appropriate way.
12 [Slides shown.]
13 MR. MIRAGLIA: I will go through this very
14 quickly. It has been indicated by Mr. Koskinen that there
15 are 25 working groups, and the NRC has been participating
16 within the energy group, as mentioned; the health care
17 section in terms of our NMSS office working within that

18 group relative to medical devices and the like; and in the
19 emergency services sector, which is response planning and
20 coordination with the emergency response and coordinated
21 federal response. The Office of Response Organization has
22 been actively involved in that sector.
23 Our approach to the Y2K concerns is an integrated
24 and inclusive approach. As has been mentioned, from an
25 international perspective, the agency sponsored a resolution
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1 at the September meeting of the IAEA regarding the Y2K issue
2 and the attention that should be paid to nuclear power
3 plants worldwide. That resolution was passed this past
4 September.
5 The NRC did identify, as indicated by the
6 Chairman, a cost-free expert that the U.S. Government is
7 paying for to support the IAEA activities in this respect.
8 In terms of public awareness, I think Mr. Koskinen
9 made it very clear that awareness of the issue, sensitivity
10 to the issue, and addressing of the issue and status is very
11 important communication.
12 Our Office of Public Affairs has been working with
13 us in terms of putting our information out on our Web pages
14 with respect to not only general letters, the responses, the
15 results of the audits.
16 You will hear a little bit later we have done 12
17 audits. Eight of those audit reports are out and issued and
18 on the Web. The others are in various stages of preparation
19 and when completed will also be on the Web.
20 So we have been sharing that information in a
21 public way along with the industry as well.
22 In terms of our approach overall, we are using a
23 risk-informed and graded approach. Most attention is being
24 paid, naturally, to the power reactors, but we are also
25 looking at fuel cycle facilities, material licensees, and
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1 power reactors, and we've been working with the Agreement
2 States and state programs to communicate the issue.
3 The common elements of all of those activities is
4 awareness of the issue, notice of what the problems are,
5 information exchange as to what are they doing and how are
6 they planning and the activities that they are engaged in,
7 and some validation of that either by inspection, audit and
8 follow-up in various meetings and the like.
9 CHAIRMAN JACKSON: Within a risk-informed context,
10 Mr. Miraglia, how is the NRC dealing with issues outside its
11 traditional area of authority that could impact risk to the
12 public vis-a-vis nuclear operations, such as
13 telecommunications?
14 MR. MIRAGLIA: I think in a number of ways. With
15 respect to some of the issues, in terms of the power plant
16 itself, our concern would be the potential loss of offsite
17 power. We need to pay more sensitivity to those processes
18 and procedures in terms of contingency planning. Those are

19 elements of risk. At some plants, as you aware, that is a
20 higher contributor to risk.
21 CHAIRMAN JACKSON: Is Mr. Wermeil going to speak
22 to that?
23 MR. MIRAGLIA: He can.
24 In the telecommunications sense, Mr. Giitter has
25 been working with the response sector and how we are looking
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1 at that and backup communications and the like.
2 Joe.
3 MR. GIITTER: NRC is a member of the National
4 Communications System. We've been working very closely. In
5 fact we've had a very good relationship with the National
6 Communications System and the President's National Security
7 Telecommunications Advisory Committee. One of the things
8 that they are doing for us at this time is going to those
9 small telephone companies that are near our nuclear power
10 plants.
11 Many of our nuclear power plants are serviced by
12 the major telephone companies, but they are going to the
13 smaller ones and helping us get some information as to
14 whether their switches are going to be Y2K compliant.
15 We are also working with those agencies to
16 establish a backup communication system that will be
17 independent of the public switch network for the transition.
18 We also are a member of the Government Emergency
19 Telecommunications System, which will provide a high level
20 of assurance that we would be able to reach our sites and
21 that they would be able to reach us in the event of network
22 congestion possibly caused directly or indirectly by a Y2K
23 problem.
24 I might also add that in the industry's
25 contingency planning document, and maybe Mr. Davis can talk
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1 about this later, NEI/NUSMG 98-07, they have a template or
2 recommendation for utilities to use in developing their own
3 contingency planning.
4 One of the key aspects of that is to have the
5 utilities contact their local telecommunications providers,
6 including the public service answering point, such as the
7 911 centers, to make sure that in the unlikely event that
8 there is a problem at the plant they would be able to call
9 in the necessary resources, such as the fire department, or
10 reach the state and local officials.
11 MR. MIRAGLIA: Jerry.
12 MR. WERMEIL: You raised a very interesting point.
13 The Y2K problem was recognized sometime ago by the staff as
14 putting this agency in a somewhat unique position of not
15 only exercising its primary responsibility for nuclear
16 safety, but also being aware of the impact of the year 2000
17 problem on the nuclear power plants' contribution to the
18 continued availability of the electric grid.
19 That was also obvious to the industry itself, and

20 in the original guidance document, NEI/NUSMG 97-07, that the
21 staff accepted in its Generic Letter 98-01 on this topic,
22 not only are those systems that we would traditionally be
23 responsible for for ensuring the safety of the plant
24 included within the scope of the program, but systems
25 necessary for continued safety operation of the plant are
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1 part of the focus.
2 Because we believe that program was appropriate in
3 its scope in our oversight of industry efforts to address
4 Y2K, we have looked at not only those systems with a safety
5 function, but those that are necessary for the continued
6 operation and those that support the plant's ability to
7 maintain its grid function. We point out in our audit
8 report some of what we see licensees doing in that regard.
9 We believe for their own reasons that, because
10 they are not in the business of anything but generating
11 power while at the same time doing it safely, that they also
12 recognized how important that was, and they are addressing
13 areas like that in accordance with the guidance that the
14 staff believed was appropriate.
15 CHAIRMAN JACKSON: Let me ask you two other
16 questions, one other on power reactors and then in another
17 area.
18 If a power reactor couldn't demonstrate Y2K
19 readiness in a safety system but at the same time had not
20 identified a specific vulnerability, how would NRC react?
21 MR. WERMEIL: We would react to ensure that that
22 plant was meeting its license requirements and our
23 regulations. If the information to us indicated that at
24 some point, either January 1, 2000, or some other point,
25 that licensee was not in compliance with its license based
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1 on a Y2K problem in a system that was necessary to maintain
2 the safety of the plant, we would raise that issue to the
3 licensee and ensure that the licensee pursued it
4 appropriately.
5 CHAIRMAN JACKSON: You wouldn't do it until
6 1/1/2000?
7 MR. WERMEIL: No. The information on the status
8 of these systems, Chairman Jackson, will be provided by all
9 licensees by July 1.
10 CHAIRMAN JACKSON: Is he going to walk us through
11 that?
12 MR. MIRAGLIA: Yes.
13 CHAIRMAN JACKSON: And talk about the decision-
14 making?
15 MR. MIRAGLIA: Yes.
16 CHAIRMAN JACKSON: Okay. I'll wait.
17 MR. WERMEIL: We have a plan that allows us
18 sufficient time to address these issues and make the
19 necessary decisions in order to assure safety at these
20 plants.

21 CHAIRMAN JACKSON: All right. Let me ask you one
22 last question. What sort of Y2K vulnerabilities may impact
23 the public outside of the power reactor field? For
24 instance, could failures in brachytherapy devices cause
25 patient overexposures, and what are we doing in that area?

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1 MR. MIRAGLIA: I think one of the areas in the
2 materials area is the medical licenses. As I indicated,
3 NMSS has been interacting with the sector. As well, we have
4 been interacting with FDA in terms of awareness of problems
5 how they are being addressed, and are the systems going to
6 be Y2K ready or compliant in those areas.
7 Dr. Cool is here, if you would like to hear more
8 on some of the interactions.
9 CHAIRMAN JACKSON: Dr. Cool, could you give us a
10 cool, succinct statement?
11 DR. COOL: Good morning, Madam Chairman and
12 Commissioners. We have been doing a number of things
13 particularly with the medical community because there are
14 some of those potentials. For a larger part of the
15 community, where you are dealing with unsealed materials,
16 diagnostic doses, or even therapeutic nuclear medicine,
17 safety is by procedure and by handling, not by the
18 electronics. So they would have to look and make sure that
19 the the dose calibrators were in fact reading out properly.
20 That allows us then to focus more precisely on
21 things like brachytherapy, teletherapy, some of the units
22 which have in one sense safety built in because the sources
23 are shielded. Those systems are generally designed such
24 that power failures result in them either not being able to
25 move out at all -- they fail safe -- or to retract the

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1 source if there is an issue associated with those, via some
2 spring mechanisms or otherwise.
3 We have been working closely with FDA, who has the
4 actual lead responsibility within the federal government for
5 things like treatment planning systems. Interacting with
6 the various manufacturers, we have in fact identified both
7 through interactions with the manufacturers and on some of
8 the inspections we have been looking at this issue on every
9 inspection since about November of 1997. So we have gone
10 essentially all the way through the priority ones already.
11 We have identified some cases where treatment
12 planning systems were not Y2K compliant. We have been
13 identifying those. Those were also already known to those
14 manufacturers. My understanding in fact is that upgrades
15 are already available for those systems that we have been
16 able to identify. A lot of those have already been put into
17 place or may take place.
18 Our understanding of the failures is more a matter
19 of non-functioning rather than an incorrect functioning if
20 they were to roll over on that date.
21 CHAIRMAN JACKSON: Thank you very much.

22 You were going to mention contingency planning.
23 MR. MIRAGLIA: Yes. What I propose to do is go to
24 the next slide, Madam Chairman. What we have is a timeline.
25 COMMISSIONER MERRIFIELD: Madam Chairman.

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1 CHAIRMAN JACKSON: Yes, please.
2 COMMISSIONER MERRIFIELD: I'm sorry to interrupt.
3 I have a follow-up question to one of yours.
4 CHAIRMAN JACKSON: Sure.
5 COMMISSIONER MERRIFIELD: I have a question about
6 the U.S. Enrichment facilities at Portsmouth and Paducah,
7 Kentucky. I believe I'm right on this. If those facilities
8 were to be shut down, there is a question about them turning
9 back on once they are down. I'm wondering what we have been
10 doing with them to make sure that they are ready as well.
11 MR. MIRAGLIA: They have reported that they will
12 be Y2K ready by April of this year. The facilities will
13 remain on line. They will have extra fuel on site to
14 maintain onsite power and emergency power. The residual
15 heat in the plant will allow them to stay hot for a period
16 of three to four days.
17 The plants would be shut down to a safe condition
18 in terms of no criticality or release issues. The concern
19 is not to have the plant go cold. So they would have those
20 procedures in place and have taken those steps.
21 CHAIRMAN JACKSON: Has any inspection or audit
22 function been assigned to resident or regional inspectors in
23 these areas?
24 MR. MIRAGLIA: In terms of the materials area and
25 in these areas, the Y2K issues are being followed up in the

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1 course of the inspections. As Don indicated, the priority
2 ones.
3 CHAIRMAN JACKSON: What about for power reactors?
4 MR. WERMEIL: Not specifically, Chairman Jackson,
5 but we have contacts with all the regional offices and there
6 have been designees to keep us informed of information that
7 they obtain that may be of use to us at headquarters in
8 dealing with the problem.
9 CHAIRMAN JACKSON: Wouldn't it be prudent to have
10 the resident inspectors, if only in an accompaniment role,
11 involved perhaps as you go through these six plants with the
12 contingency planning since they are the ones who are right
13 there?
14 MR. WERMEIL: Absolutely. One point that perhaps
15 I should have made is during the 12 audits the resident
16 inspector on site was available and was aware that we were
17 there.
18 CHAIRMAN JACKSON: I'm talking about beyond being
19 aware that you are there, even if they are a silent team
20 member, to have them there so that they can be much more
21 informed and apprised of situations and attuned to them.
22 MR. WERMEIL: With regard to contingency planning,

23 that is an excellent idea. The resident inspector will be
24 asked to be on site on January 1, 2000, and will be involved
25 in that effort very strongly.

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1 CHAIRMAN JACKSON: So we agree that's it's prudent
2 to have at least have some coverage by having some
3 inspectors involved at this stage of the game.
4 MR. WERMEIL: Yes, we do.
5 CHAIRMAN JACKSON: Very good.
6 COMMISSIONER DICUS: Madam Chairman.
7 CHAIRMAN JACKSON: Yes, please.
8 COMMISSIONER DICUS: You may have said and I
9 missed it. Were medical licensees the only materials
10 licensees that have been identified as potential problems?
11 MR. MIRAGLIA: No. Don, since he's at the table,
12 can perhaps address it in more detail. All the materials
13 licenses were looked at in different ways in terms of
14 notification, what activities that they had undertaken.
15 Don.
16 DR. COOL: We have in fact done a number of
17 things. The information notices that we have put out have
18 gone to all licensees. Early on in the process, well over a
19 year ago, we did a survey which involved talking to a
20 representative or to a licensee or to each of the classes'
21 broad scopes in a variety of situations, looking to see if
22 there were potential weaknesses that we needed to follow up
23 in a particular segment. We have not identified any of
24 those.
25 My inspectors are asking a series of Y2K issues in

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1 terms of awareness, identification of issues, and any
2 actions that are taken on every single inspection that they
3 are going on irrespective of the kind of facility.
4 COMMISSIONER DICUS: How about non-power reactors?
5 MR. MIRAGLIA: In terms of non-power reactors,
6 there are a number of issues there in terms of notices. We
7 have been working with the organization TRTR, the Test
8 Research Test Reactor group, in terms of understanding the
9 problems and how they are addressing those kinds of issues.
10 In a similar manner, during the course of inspections those
11 matters are looked at. That covers the range of the
12 activities.
13 As I said, there are common elements of making our
14 licensees aware of our understanding of what they are doing
15 to address the problem and then in some sort of follow-up
16 either by inspection, audit or follow-up surveys and
17 telephone calls and things of that nature.
18 Another example, Commissioner Dicus, is that
19 during the MRBs with Agreement States for the last 18 months
20 that has been a question that has been put to the state
21 representatives during the course of the MRB meetings.
22 CHAIRMAN JACKSON: Thank you.
23 MR. MIRAGLIA: The next few slides are represented

24 in a timeline of the activities of the NRC's oversight with
25 respect to the Y2K issue. It's sort of a road map of where
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1 we have been, where we are today, and what is left to be
2 done.
3 The main focus within the timeline is power
4 reactors, but you will note that we also address some of the
5 activities that we have engaged with in terms of the fuel
6 cycle facilities as well.
7 As indicated, this is an issue that the agency has
8 identified and has been dealing with back to 1996.
9 At the request of the NRC, the Nuclear Energy
10 Institute and the Nuclear Utility Software Management Group,
11 the NUSMG acronym that you've heard, initiated an effort to
12 provide a guidance document to assist nuclear power plants
13 to develop a program that would effectively address these
14 issues.
15 The scope of that document is broad in terms of
16 determining the scope of issues and systems to be examined,
17 the test protocols, the documentation, the QA oversight, and
18 the sharing of information. So it's a fairly complete
19 document. As Mr. Wermeil has indicated, it is one that we
20 endorsed in the context of our initial Generic Letter 98-01,
21 which was issued in May of 1998.
22 Responses to that letter were received in August
23 of that year. What the letter asked for is what program
24 were they going to follow, and that 98-08 and the NUSMG
25 document was an appropriate protocol; if they were going to
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1 deviate from that, they needed to explain what they were
2 doing and how they were doing it. All of those responses
3 indicated that that was the document that the industry was
4 going to follow, without exception.
5 In September of 1998, we started audits of 12
6 licensees. As has been discussed to some degree, these 12
7 audits represented approximately 20 plants, representing
8 units of different vendors, different size, different
9 locations, large utility, small utility, to try and get a
10 range of utilities with large resources, small resources,
11 and it addressed the problem.
12 If you look at the total number of facilities that
13 we have licensed for these utilities, although we went to
14 those 20 plants, it expands out to 42 units. For example,
15 Commonwealth. We looked at one dual unit station, but that
16 program and implementation would be applicable to all of
17 their stations.
18 Those audits were started in September. We
19 completed the last of the audits at the end of the month.
20 As I indicated, eight of those audit findings are on the
21 Web; four of the audits which have been completed in the
22 last few months are in various stage of preparation, and
23 those will be placed on the Web as well.
24 Also, in January we issued 98-01 Supplement 1.

25 That supplement was a request in response to the industry
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1 request to provide information beyond the information
2 requested in our initial generic letter. This was a result
3 of the Disclosure Act that Mr. Koskinen discussed with the
4 Commission a short while ago, to provide the information on
5 systems even beyond those covered. That was acceptable, and
6 the supplement indicates that.
7 The results are all due to be reported to the
8 staff in July of 1999.
9 That is sort of where we are today.
10 Our plan is, in March, to issue an information
11 notice that summarizes the findings from all of the audits
12 and share that with the industry and provide those
13 observations and lessons learned.
14 I think you will hear from Mr. Davis that there is
15 a fair amount of industry exchange among the industry with
16 respect to their findings.
17 In addition, in January we issued a draft
18 contingency plan. That contingency plan is out for comment.
19 The comment period is due to end the 19th of February. Our
20 plan is to review those comments and provide a final NRC
21 agency contingency plan to the Commission in the March time
22 frame.
23 COMMISSIONER MERRIFIELD: Madam Chairman.
24 CHAIRMAN JACKSON: Yes, please.
25 COMMISSIONER MERRIFIELD: I have a question
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1 regarding that. To what extent are we going to be putting
2 those contingency plans through exercises to test emergency
3 communications?
4 CHAIRMAN JACKSON: They are going to talk about
5 table top exercises.
6 MR. MIRAGLIA: We are going to cover that,
7 Commissioner. We will talk in terms of some table tops and
8 some additional work to be done.
9 COMMISSIONER MERRIFIELD: That's fine.
10 MR. MIRAGLIA: In addition, as was discussed in
11 the previous panel, we have identified the need to review at
12 least six licensees' implementation of the contingency plan.
13 The industry's guidance relative to contingency planning was
14 developed a little later than the initial NUSMG guidance,
15 and as a result of our audits, they weren't developed enough
16 for us to make judgments. We do plan to conduct at least
17 six reviews of the contingency planning efforts by the
18 industry.
19 Also, you are probably aware that we have been
20 petitioned by the Nuclear Information Resource Services for
21 three rulemakings. Those petitions were received in
22 December and a Federal Register Notice was published asking
23 for comments on those petitions for rulemaking.
24 It deals with three issues in terms of rulemaking:
25 to have the plant shut down prior to the transition to

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assure safety; concerns about providing adequate emergency and additional emergency power supplies on site; and the contingency planning for the licensees be exercised.

The staff has that petition under review. We are receiving comments on that, and we hope to provide that review and that decision in the month of April.

In June we would hope to complete the six reviews. We haven't picked the facilities yet, but our plan would be to complete those reviews. Our overall plan is to have information relative to their readiness in July and our audits completed, to have that information to decide where do we go from here based on the information or our understanding of the state of readiness.

CHAIRMAN JACKSON: I was correct in saying that these six licensees are different than the 12?

MR. MIRAGLIA: That's our plan, yes, Madam Chairman.

In that same time period we are also going to further develop our internal procedures for our own contingency plan and test those initiatives.

There is a national table top exercise that is being considered in the month of June. Perhaps Mr. Giitter can talk a little bit to that to give the Commission an idea of the scope of that.

MR. GIITTER: There are two dates. I don't know

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that they have been firmly established yet, but they seem to be the dates that people are focusing in on, particularly FEMA.

The first date would be an exercise where the major players in the federal response plan would respond to a Y2K scenario of some kind. They would respond in their roles under the federal response plan. That would be like an exercise on a Saturday, eight hours long.

The following Saturday there would be a cabinet level exercise where the heads of the agencies, the cabinet secretaries, and the vice president would participate for about four hours. It would be more of a walk-through of the process that occurred on the previous Saturday.

I believe the dates scheduled for those right now are the 19th and 26th of June.

MR. MIRAGLIA: Two consecutive Saturdays in June is the initial plan at this point in time.

Next slide, please.

CHAIRMAN JACKSON: Let me just ask a question.

Did this address your question? Did that answer your question you asked about testing of contingency plans?

COMMISSIONER MERRIFIELD: I'll hold off until we get to the end.

MR. MIRAGLIA: We have another exercise planned later. Our present plan in October, Commissioner

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Merrifield, would be for us to conduct an NRC Y2K exercise. Joe.

MR. GIITTER: Right now, what we are looking at is a fairly significant exercise that would essentially dry run all aspects of the contingency planning, including the international cooperation and communication. We would hope to have some licensee involvement. We know that many licensees will be exercising their contingency plans at about that same time frame, and we would like to have some licensee participation as well. It's possible we will be testing our own internal procedures that we developed. Right now we are looking at the October time frame for that exercise.

COMMISSIONER MERRIFIELD: Is it the thought to also test the emergency communications procedures?

MR. GIITTER: Yes. That would be a major part of that.

COMMISSIONER MERRIFIELD: We would have some of the equipment at that point?

MR. GIITTER: That is one of the reasons we are looking at October and not sooner. We think it's going to take a while to implement that.

In fact, what we are looking at is mobile satellite equipment that would be easy for people to use at every nuclear power plant site tying into a national

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telecommunications coordination network, the network that I talked about that the National Communications System is setting up. The idea would be that during that exercise we would test those communication links.

COMMISSIONER MERRIFIELD: One of the things that the contingency plan goes into is if there is a loss of grids. Region IV, for example is on a different grid. Will we be testing that element of it as well?

MR. GIITTER: As part of that exercise we will have Region IV play in the role as a backup operation center. We haven't determined yet whether it would involve a simulated failure of the headquarters operations center or having Region IV take overflow of some Y2K problem that may be simulated during the exercise. That is what we are looking at right now. This is very preliminary. We still have a lot of details to work out.

MR. MIRAGLIA: Commissioner Merrifield, there is still a lot to do and work to be done. The first one is to finalize the contingency plan, and that is going to happen in March. June is to start developing those internal procedures relative to how we are going to implement that plan, including the aspects of the backup response center that we have envisioned in the plan, and then how to exercise that plan.

COMMISSIONER MERRIFIELD: Do we have any specific

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contingency plans as it relates to the Portsmouth facility I asked about earlier?

MR. GIITTER: They are included in the contingency plan that we developed along with our nuclear power plant licensees, non-power reactors, and materials licensees. So they are included, and that is something we are looking at in the contingency plan.

CHAIRMAN JACKSON: Don, do you have any additional comments you want to make in that regard?

DR. COOL: Just to note that at this point the planning is to include within the staffing of the center folks who can handle a fuels facility in parallel with a power reactor facility. So there would be some personnel immediately available on that night.

CHAIRMAN JACKSON: Do we know how many reactor events requiring an NRC response the agency could handle at one time?

MR. GIITTER: The design basis is two events at once, and that has been tested in the past.

MR. MIRAGLIA: It has been tested. I can recall one instance where we had an ongoing reactor event and an ongoing materials event in the center as well. That has been a while back. So we have had simultaneous issues to various degrees.

MR. GIITTER: It was on the 4th of July. I can't

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remember the year. We had two events at once, and one was loss of offsite power and a diesel generator problem, and the other one was a stuck-open safety valve. We responded to both events at the same time. But that is our design basis, two events at once.

COMMISSIONER DICUS: Does our contingency plan have the flexibility, however, to handle three?

MR. GIITTER: That is one of the reasons we are looking at Region IV to provide some backup.

MR. MIRAGLIA: In addition to that, what we need to work out and an issue that we haven't fully developed, and this is work to be done, is that we are planning for Region IV to be the backup, but there are the other regions there, and what role might they play. We need to coordinate that. Those are additional activities that we need to consider and try to address.

Each region will have a different role, depending on circumstance and situation. Region IV has been designated as the backup in terms of it's a separate grid. It's also a two-hour time difference that is working for us in terms of the rollover of the clock, and that's why Region IV was chosen. We do have some other elements that are planned and that we need to flush out and consider.

CHAIRMAN JACKSON: It's a different grid, but it also is fairly interconnected, is it not, with Mexico?

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MR. MIRAGLIA: I believe that is the case. If you

2 go to Region III, we would probably have interconnections
3 into Canada as well.
4 CHAIRMAN JACKSON: Maybe Mr. Davis can speak about
5 some of what the industry may be doing in that regard in
6 terms of grid reliability, because the trans-boundary
7 interconnection creates vulnerabilities for the U.S. grid in
8 certain spots. I know we have had very strong, at least I'm
9 told, planning and coupling with Canada. I have less
10 information about Mexico. But that may be because I just
11 came back from Canada.
12 MR. MIRAGLIA: Slide six, please.
13 As I said, in July we received the responses, and
14 we'll have an idea on the state of readiness in terms of
15 dates and compliance and readiness issues within the
16 industry. We also have the results of our audits to
17 evaluate.
18 The point in time in August is to assess what
19 regulatory actions might be necessary to follow up based on
20 our understanding for the state of readiness. Those could
21 be focused reviews, additional site visits, requests for
22 additional information, management meetings, telephone
23 conferences, and plant-specific orders to assess the
24 information and require appropriate response.
25 In September of 1999, we would make a decision on
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1 any need to issue a plant-specific order for Y2K problems.
2 We hope to be ahead of the power curve, so to speak.
3 As we have discussed already, in October of 1999
4 we would have the exercise of the agency's contingency plan.
5 Joe indicated there has been some interest in the
6 international community of various countries to come and
7 witness and observe. We hope to have some participation of
8 licensees within that context.
9 In December we will stand ready to implement the
10 plan, and within the context of the contingency plan, the
11 response center will be manned 12 hours before, and we will
12 have sustained manning until 12 hours after the transition
13 date.
14 Commissioner McGaffigan mentioned some additional
15 dates. Those dates are being considered within the
16 industry. In fact, I believe there are dates that go beyond
17 the year 2000 that are being looked at as other transition
18 type and rollover kinds of issues.
19 CHAIRMAN JACKSON: Let me ask you two questions.
20 Should plant-specific Y2K actions be required, will they be
21 coordinated in such a way as to allow time to arrange for
22 replacement power?
23 MR. MIRAGLIA: Our plan in terms of having it done
24 in September would give us that time. Those orders could be
25 as severe as shutdown or they may address specific issues as
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1 well. The idea would be if we have concerns to have those
2 identified by September such that we can plan accordingly.

3 CHAIRMAN JACKSON: If a shutdown order were
4 required, have you developed factors that would affect when
5 the actual shutdown would best be accomplished?
6 Mr. Gunter, of course, is going to speak with us,
7 and he has suggested that they be ordered six months in
8 advance of the new year. Obviously, if we are coming up on
9 a September time date, we don't feel that is necessary, or
10 at least the timeline doesn't suggest that. Or is there a
11 risk-informed basis for a variability in shutdown?
12 MR. MIRAGLIA: I think there is a little bit of
13 both, Madam Chairman. It's in the area of work to be done.
14 We have some preliminary views that maybe Mr. Wermeil can
15 share in a broad kind of context of some of the
16 considerations that we are looking at.
17 CHAIRMAN JACKSON: It's still under review.
18 MR. MIRAGLIA: It's not even half-baked. It's raw
19 dough in a cold oven.
20 [Laughter.]
21 MR. MIRAGLIA: I don't want to raise expectations.
22 CHAIRMAN JACKSON: Is your oven on?
23 [Laughter.]
24 MR. WERMEIL: Mr. Miraglia is correct. We are
25 considering a set of guidance or an approach to how we would
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1 address issues where we felt we needed to act on a
2 plant-specific basis to address a Y2K concern. That is
3 being coordinated now within the staff.
4 I think whatever action we would take, Chairman
5 Jackson, would depend on what the situation was.
6 CHAIRMAN JACKSON: It's not that you need to tell
7 me specifically, but I think the Commission needs to know
8 that you have some set of criteria developed certainly by
9 the time of the September date for making that decision.
10 MR. MIRAGLIA: We will be sharing that with the
11 Commission.
12 CHAIRMAN JACKSON: Thank you very much.
13 MR. MIRAGLIA: That completes our prepared
14 presentation.
15 CHAIRMAN JACKSON: Don't go away. Now we will
16 hear from Mr. Jim Davis from the Nuclear Energy Institute.
17 I want to thank you for sharing your phone number with us.
18 We'll give you a call.
19 MR. DAVIS: I want to thank you for an opportunity
20 to share some of my insights on what is going on in the
21 industry programs. I have been responsible over the last
22 two years for the coordination of that program.
23 I think I would like to start with what I'll call
24 a compliment and a challenge to the Commission.
25 As I look around at all the people that have been
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1 critiquing that program and making comments, the only people
2 that have the technical competence to really evaluate and
3 have been involved in the industry's program in an oversight

4 role has been the NRC. There is no other government agency
5 or private agency that has attended our meetings or taken
6 advantage of the opportunity to see what we are doing.
7 We've operated in the public arena, workshops, meetings.
8 We started long enough ago that Y2K was not a big
9 issue in the public arena, and we got most of our planning
10 done before the rest of the world was interested or your
11 staff was there. As we get to the end and start talking
12 about what I call the madness bug, I think we both have the
13 challenge to put the right story into the public arena, and
14 you're the only one who has the independent capability to
15 make that judgment on how we are doing. People think I'm
16 biased.
17 Second slide.
18 Three topics I'd like to cover very briefly. I
19 want to look forward to what we are doing and not look
20 backward.
21 To do that, with all the discussion that has gone
22 on, the objectives of our program have sort of gotten fuzzy
23 as the rest of the world has defined their objectives for
24 what a program ought to be. The name of the manual is
25 "Facility Y2K Readiness." That is what we are moving toward

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1 reporting in July.
2 The objective of the program from the beginning
3 was to be able to keep steam to the turbine and electricity
4 coming out the other end. To do that, as always the intent
5 was to comply with regulations, rules, and licensing.
6 That's not just the NRC's, but anybody else that has put
7 requirements on the operations of a facility. It went well
8 beyond just regulated components that other people have
9 implied, to include all systems that have some potential for
10 impacting the ability to keep that turbine going around and
11 putting electric power out.
12 CHAIRMAN JACKSON: Let me just say the following.
13 I would like to think since you are talking to the NRC that
14 there is really a twofold goal. One part of it is the
15 safety of the plant, that is, minimize the risk problems
16 with plant safety systems. The second goal is within that
17 context to keep the plants running relative to these larger
18 issues of stability of the grid and infrastructure.
19 MR. DAVIS: I guess it's a fully integrated
20 approach. The philosophy is you operate safely. So if I
21 say I want to keep the turbine running, of course we want to
22 keep it running in a safe manner.
23 CHAIRMAN JACKSON: I just think it's important, at
24 least from our perspective, to --
25 MR. DAVIS: I think you will sort of see some of

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1 that thought process in the next slide when I get to it.
2 CHAIRMAN JACKSON: I very seldom sit in this
3 position and give advice to people across the table, but
4 from the point of view of what Mr. Koskinen talked about

5 earlier in terms of sharing of information, and you've given
6 us a challenge, which I think is an appropriate one, I want
7 to give you a challenge. I think that the language with
8 which you discuss what your intent is is very important,
9 because people do realize that there are licensees or people
10 who are so focused on operating sometimes.
11 MR. DAVIS: I understand.
12 CHAIRMAN JACKSON: I think it's a question more of
13 semantics, but I think it is very important in terms of what
14 message is conveyed to the public that people understand
15 that that balance is there. That's all I'm saying.
16 MR. DAVIS: The final point is, of course, we are
17 not just looking at the rollover date; we are looking at the
18 ability to operate well beyond December 31, 1999, for a
19 number of years after that.
20 Next slide.
21 I think this sort of addresses your point. When
22 we started, we realized, one, you're going to have to fix
23 everything that has a year 2000 problem some day, and yet we
24 were a little bit concerned about the ability to fix
25 everything before the rollover date. So we did what we call
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1 initial assessment, a prioritized approach. I have sort of
2 used some color coding.
3 At the top of the list was "critical." I've sort
4 of split it. You'll see a red band, which in fact
5 represents the safety systems and the systems required for
6 the safe operation of the plant. Within that same area
7 would be something like the turbine control unit. If it
8 trips, it shuts down the plant immediately.
9 Important items are other things like plant
10 process computer, the security system, and other components
11 that have an impact on your ability to operate the plant
12 even though they don't instantaneously trip that.
13 Within the context of the program, we see that
14 whole matrix as being what we are talking about in the
15 facility readiness arena. There was a prioritized approach.
16 We addressed the most important, the critical ones to safety
17 and those issues first, and worked our way down through the
18 list. So it was prioritized.
19 There was an "other" category, which represented
20 some things that were important to the business continuity
21 of the system. An example might be a training management
22 program that keeps track of requalification dates. You can
23 do it manually, but it's manpower intensive. That system
24 would be cost effective to get it taken care of.
25 Finally, we found that there were a number of
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1 things that were in fact not essential in any manner, such
2 as a fax machine in a secretary's office. It was not worth
3 the time and energy to track and remediate that. So if it
4 fails, we'll fix it when we get there.
5 So it's sort of important to go back and remember

6 where we started in this particular arena.
7 Next slide.
8 With that as background, I thought I would give
9 you the status of the industry as of January 31st. Of
10 course we are talking about the 66 facilities and 103
11 nuclear plants, and we have total cooperation of every one
12 of those. That initial assessment has been completed.
13 The detailed assessment, which is a phase where
14 you test to see whether there is a year 2000 problem and
15 establish the remediation program that you are going to put
16 in place, on average we are 92 percent through that
17 particular program.
18 Most of the items remaining are in a structured
19 program to come to completion or a lower priority on the
20 industry's list as far as impact on the plants.
21 Remediation on average is 54 percent complete.
22 CHAIRMAN JACKSON: When do you think that
23 remediation average will be 95 to 100 percent?
24 MR. DAVIS: Sometime in May would be my
25 projection.

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1 CHAIRMAN JACKSON: Has the industry established a
2 target date that in any way ties in with our target dates
3 for your response?
4 MR. DAVIS: Yes. Our goal is to finish the
5 program and to be ready by 1 July, the final bullet. Since
6 November my reporting has been aimed at that report. We are
7 using the same terms and verbiage as we used in the manual
8 and as we expect people to use in the report that they make
9 on 1 July. In the final bullet we have 17 sites that have
10 identified specific remediation items that will go beyond
11 that 1 July date. The average is two items at any one site.
12 So we are talking about 34 items.
13 CHAIRMAN JACKSON: But nothing in that red and
14 dark red band?
15 MR. DAVIS: There is something in that red and
16 dark red band. For example, we consider the feedwater
17 control unit to be a critical item because if it trips, it
18 will shut down the plant. There are two cases where we will
19 have upgrades done in a fall outage to a feedwater
20 controller.
21 It has been done on one unit, the same exact piece
22 of equipment, so we know it's going to work. They are going
23 to put it in the second unit in the fall outage.
24 It doesn't seem appropriate to recommend a
25 five-day unplanned outage to do that upgrade when you have

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1 very high confidence that you are going to be able to make
2 that repair. That's the only thing I can think of that is
3 up in that top quadrant of my band.
4 CHAIRMAN JACKSON: We've decided what we are going
5 to do given our September date, something within this red
6 and dark red?

7 MR. MIRAGLIA: That will have to be examined. As
8 I said, site visits and follow-up. Mr. Koskinen mentioned
9 the consideration of the NERC information. We are going to
10 try to differentiate status in terms of delayed status with
11 good justifiable cause relative to outages as opposed to
12 those things that are not indicating progress in the
13 program. So I think it is that same kind of logic that we
14 hear. We'd have to have an understanding of what is done
15 and the basis for the deferral.
16 CHAIRMAN JACKSON: What is the status of
17 activities at the slowest plant?
18 MR. DAVIS: Status of activities at the slowest
19 plant?
20 CHAIRMAN JACKSON: Right, in terms of their degree
21 of detailed assessment, remediation, et cetera.
22 MR. DAVIS: I don't remember the specific numbers
23 for which plant was at the slowest end, but my analysis
24 shows that every plant can meet the objective of completing
25 their program by 1 July and making the report.

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1 CHAIRMAN JACKSON: I guess I'm interested in the
2 actual work being done, the testing, and so forth.
3 MR. DAVIS: The problem with the numbers is that
4 we are working our way down and we are talking about a short
5 list of items. If I really want to know what's going on on
6 a plant, I talk to them about the list of items they are
7 working on and when those will actually be completed.
8 Whether they are at 40 percent on remediation or 80 percent
9 on remediation, the actual items that they are working and
10 their significance is more important.
11 CHAIRMAN JACKSON: I agree, but I'm speaking to
12 the data you presented to us, which is presented in terms of
13 percentages. What I expect these folks to look at is in
14 fact the actual items, particularly those that would be in
15 the red and the dark red bands.
16 MR. DAVIS: And the report that comes in in July
17 will list the actual items that are outstanding; line number
18 by line number, it will list every item that is outstanding.
19 Any other questions on the status?
20 CHAIRMAN JACKSON: No. I'll have more for you,
21 though.
22 MR. DAVIS: Audits has been a topic of discussion
23 in the past. I guess I'd point out that the title of our
24 manual has the word "NUSMG." People don't realize that this
25 industry may be a little bit strange. NUSMG is a software

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1 quality assurance organization that has been in place for a
2 significant period of time. They are in there because we
3 drew on their talents. So we've had quality assurance
4 inputs and involvement from the beginning of the program.
5 Within the industry there have been three types of
6 audits conducted.
7 The first is the internal QA program audits

8 conducted by the independent auditors within the facility, a
9 program developed and required by regulation. Fifty-four of
10 those audits have been conducted.
11 CHAIRMAN JACKSON: Is that at 54 sites?
12 MR. DAVIS: At 54 sites, that's correct; 54 of 66
13 sites have had the internal QA program audit.
14 Cross utility audits have been one of our most
15 productive audits where we bring the expert from one
16 facility to another facility or from several facilities to a
17 facility to do an audit, in part because the program
18 managers take back almost as much as they give when they are
19 doing the audits. We've had 33 of those.
20 Third party audits from a variety of independent
21 contractors or whatever, 43 of those have been conducted
22 throughout the industry. This does not include any of the
23 NRC oversight.
24 At this point, 62 of the 66 facilities have
25 completed an audit of some type, as listed above. The four
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1 other sites have audits in progress or scheduled. So we
2 will have an audit conducted at every site.
3 CHAIRMAN JACKSON: How are the lessons learned
4 disseminated within the industry? Is INPO involved in terms
5 of best practices, et cetera?
6 MR. DAVIS: INPO is not involved in this aspect of
7 the program. I have what is called a moderated list server,
8 which means you've got to be a member of it to use it. It
9 involves the project managers at every facility and in many
10 cases the people working for them. Insights and lessons
11 learned have been freely shared and exchanged on that
12 particular Web site. That includes insights that we have
13 gotten from the NRC audits. We summarize those; we publish
14 that to the industry.
15 In December we had a two-day workshop which was
16 basically an opportunity to review where we were and sort of
17 do the course corrections that might be needed for the final
18 year of the effort. We reviewed the NRC audits in detail
19 and we reviewed all the industry audits that had been
20 conducted, and we shared lessons learned during that
21 particular workshop.
22 COMMISSIONER MERRIFIELD: Madam Chairman, I have a
23 question.
24 Regarding your analysis of various aspects, to
25 what extent have you been working on the issue that was
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1 raised in the earlier panel about telecommunications? Some
2 of these plants are served by telephone companies of very
3 small size that may not be as fully up to speed. To what
4 extent have the utilities been going out beyond the plant
5 gate, so to speak, to deal with those issues from a
6 communications standpoint?
7 MR. DAVIS: When we looked at contingency
8 planning, and that is a primary area that you look at, we

9 thought that grid stability and telecommunications support
10 were the two issues that were most important to the facility
11 in that arena.
12 In the grid stability arena, we've been heavily
13 involved in NERC and following the NERC process. They are
14 obviously the experts in managing the grid and what is going
15 on. In fact, in the most recent meeting a concern was
16 raised that the total load is going to be so low and we are
17 talking about so much spinning reserve on line that we may
18 generate instabilities by the number of plants that we put
19 on line. So there actually is going to have to be some
20 thought in that arena to ensure that the load and the
21 generation on line is in fact appropriate.
22 My evaluation is I think that is an area that NERC
23 is very good at. They've been doing that since the '80s,
24 and they seem to be approaching that part of their
25 assignment fairly well.

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1 We recommended that the facilities delay their
2 contingency planning until January of this year. We issued
3 the manual in August, but we found that there just wasn't
4 information available from the suppliers to make rational
5 judgments and evaluate whether they would or would not be
6 able to provide the services. That information is now
7 available and people can judge which of their suppliers will
8 be reliable and which ones won't. People are looking at
9 multiple sources of communications to provide the backup
10 that they need.
11 I'm sure you are aware that EPRI has had a program
12 working on embedded systems. That has also provided another
13 forum for sharing. This isn't just a nuclear problem; this
14 is for all the electric utility businesses.
15 They've had several interactions with the
16 telecommunications industry during those forums all the way
17 back to the one last August, and they also had some other
18 discussions in one just recently held. In that forum there
19 is a lot of information being shared on what is going on in
20 the telecommunications area.
21 At this point I think the facilities have the
22 information they need to make rational decisions on what the
23 risks are and what the mitigation strategies would be for
24 issues in the telecommunications area.
25 That sort of backs me into the discussion of

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1 contingency planning. The reason I want to spend a few
2 minutes on this is because from the planning standpoint,
3 this is where we put most of our work and that's where a lot
4 of our discussions and the exchanges back and forth are
5 going. The remediation program, the guidance has been laid
6 out, and we're coming to the close of the execution phase of
7 that.
8 In the first slide, the thing I really want to
9 emphasize is that contingency planning is in fact an element

10 of the overall facility readiness program and not a
11 stand-alone program that goes off and does something totally
12 independent. It's an integrated effort to keep the facility
13 so it can operate and operate safely.
14 I didn't put it in the slide, but one of the other
15 points that we have continually made is that contingency
16 planning is not an alternative to remediation. Our program
17 requires that you find and fix the Y2K issues related to the
18 scope of the program that we discussed earlier and you don't
19 say, gee, I may have a problem here; I'll put a contingency
20 plan in place and hope that that will catch it.
21 Next slide, please.
22 We are looking at two distinct areas because of
23 the difference in how you have to analyze it and manage the
24 program in that area.
25 One is internal risks, which are things that are
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1 under the facility's control, things that are within the
2 fence, so to speak.
3 External risks is primarily the suppliers that we
4 are talking about. In fact, the external may be a different
5 element of the same company, and we consider that an
6 external risk or an external factor.
7 Then sometimes you have to make judgments without
8 having full information.
9 CHAIRMAN JACKSON: Let me ask you a variant on the
10 question that I asked Chairman Koskinen when he was here.
11 To what extent has the Y2K Information and Readiness
12 Disclosure Act enhanced information sharing? You mentioned
13 there is sometimes a lack of detailed information.
14 MR. DAVIS: I can answer that one. In 1997 the
15 engineers were freely exchanging information. I would call
16 a facility and they would give me anything. I would call a
17 vendor, and they would tell me exactly what was going on and
18 what the issues were.
19 CHAIRMAN JACKSON: Stop. You're telling me the
20 history of the industry, and so there is as much information
21 sharing as there needs to be.
22 MR. DAVIS: No. In 1998 the story changed. The
23 Washington Post said there is more money to be made in
24 litigating than there is to be made remediating. Suddenly
25 it became very difficult for us to get information from
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1 anybody because now there was this legal concern that was
2 coming to the fore as we started to move forward in the
3 program. I have seen that pressure relieved and people are
4 now back to exchanging information because of the Disclosure
5 Act. It has had a very definite impact on the ability to
6 get reasonable information from suppliers and from other
7 parts of the program.
8 CHAIRMAN JACKSON: That's good.
9 COMMISSIONER MERRIFIELD: Madam Chairman, there
10 was another element of Mr. Koskinen's comments, and that was

11 the degree to which the utilities are sharing with the
12 general public information about what they are doing. He
13 asserted that some entities, some companies were being very
14 closed mouth about what was going on.
15 I guess my question is, to what extent is NEI and
16 its members going to be doing, for lack of a better word, a
17 public informational effort to try to give some confidence
18 to the public that you are indeed doing the things that need
19 to be done to have the confidence that when they turn on the
20 lights when that date rolls around that they will be still
21 on it.
22 MR. DAVIS: There are two issues. One, the
23 priority has to be on getting the work done and getting the
24 remediation done. I've been trying very hard to protect the
25 project managers, because this is a challenging program and
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1 they've taken on an ambitious task and made some commitments
2 to get things done. I've been trying to protect the project
3 managers so that they can get their part of it done. The
4 nuclear element is one part of a program. Every utility has
5 some sort of information sharing approach.
6 In fact, Steve Unglesbee, one of our PAO types is
7 here today, and we'll make sort of a media release. We're
8 trying to get the information out at the NEI level.
9 What I see is important is this report that we are
10 talking about at 1 July, because I see that as an
11 opportunity for us to come to a point where I think we can
12 put the whole thing in the public arena and have it
13 understandable.
14 When you have lots of little elements that you are
15 talking about and you say, well, this one is going to be
16 done there and this one is going to be done there, it gets
17 very confusing, and in fact you have to spend a lot of time
18 and attention to truly understand where the industry really
19 stands, as we discussed earlier. The numbers by themselves
20 tell me very little. It's only a vehicle for me to get at
21 what is really going on.
22 I'm looking for this 1 July time frame to be an
23 opportunity for us to lean forward in that area.
24 COMMISSIONER DICUS: If I could follow up on that.
25 I certainly would encourage you to encourage the industry to
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1 be as open as possible, though, and to be dealing with the
2 public, particularly the public around the plants, as early
3 on as possible. I think that will help give much greater
4 confidence. I'm not sure I would wait until July. I
5 understand the report, et cetera.
6 MR. DAVIS: That is a generic issue. It has been
7 discussed. It has not only been discussed within our forum,
8 but it has been discussed within the NERC forum, the
9 workshops I've gone to there, and various others. I think
10 we all realize the need to get the right information into
11 the public arena, and I think we are trying to do that,

12 while at the same time keep the program going forward.
13 We've actually got some demonstrations that we are
14 recommending people run for the press to try to understand
15 what causes a failure and what it looks like and that kind
16 of stuff.
17 Don't get the impression that we are not involved
18 and not trying to get the information out. I think at every
19 utility the program manager is working with their public
20 relations people. I look at a number of Web sites and there
21 is a lot of information available in the public arena from
22 the utilities. The question is whether people can digest
23 that and accept that as a truthful answer. I think that is
24 where our problem is. People sometimes don't want to accept
25 the utilities' statements as to where they are.

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1 COMMISSIONER MERRIFIELD: I share Commissioner
2 Dicus' comments. There was a CEO at a utility I recently
3 visited who shared the same concerns. There are a lot of
4 people out there trying to sell generators to the American
5 public that they don't need because of a concern that the
6 lights are going to go out. To the extent that there is not
7 sufficient information, I think part of that activity is
8 because some of the public haven't gotten that information.
9 I think there does need to be a commitment of NEI
10 and its members with other non-nuclear power producers to be
11 out there not only getting the job done, but making sure the
12 public is aware of it. I can't stress that strongly enough.
13 CHAIRMAN JACKSON: I'd put it even more strongly.
14 I would say a part of getting the job done is sharing the
15 information with the public. You mentioned something that
16 struck my fancy, which had to do with even having
17 demonstrations. Otherwise, it becomes a "don't worry, be
18 happy" message.
19 There is always this balance of protecting. We
20 have it around here with people so that they can get done
21 what they've been asked to do vice having to interface, but
22 it doesn't necessarily have to be the project manager who
23 goes out there and does it.
24 You all know as much as we do that you exist
25 within a particular context in terms of these communities

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1 where the plants are, with your own public advocates in
2 states that have them, and things like that. Investment up
3 front could pay dividends in the end not only in terms of
4 not having public panic, but actually developing a level of
5 trust with the communities around you.
6 MR. DAVIS: Thanks for the input.
7 Slide number 9 just emphasizes that it's a
8 balanced program and that in fact most of the contingency
9 planning will focus on the external risks because
10 remediation has been the predominant effort in the internal
11 risk area.
12 To do an individual contingency plan relative

13 component, you need three elements. There has got to be
14 some risk of failure; there has got to be some consequence
15 of that failure; and you need to have some sort of
16 mitigating strategy.
17 The example I use in that area is the turbine
18 control unit. If the turbine control unit trips, of course
19 there is a very short period of time, nanoseconds between
20 the time it trips and the time the reactor trips. So having
21 a contingency plan for what you do in that case is not very
22 productive. You ought to put your effort somewhere else in
23 there.
24 CHAIRMAN JACKSON: Is the industry aware of NRC's
25 contingency planning and are there any significant concerns
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1 one way or the other?
2 MR. DAVIS: The industry is aware of the NRC
3 contingency plan, and it was issued, I think, the day before
4 our workshop and we actually discussed it at the workshop.
5 You will get some comments from us tomorrow morning. The
6 NSAIC is meeting today and they have an opportunity to
7 review it. We basically think it will be very supportive.
8 The one comment that we have is we think that the
9 discussion of 50.54(x) is unnecessary because we don't see a
10 scenario that will put us in a position that we will go that
11 far. So our recommendation is that you not waste your time
12 thinking about 50.54(x), that the other elements are going
13 to be perfectly adequate to support the scenarios that we
14 see.
15 MR. MIRAGLIA: We asked for comments on those
16 approaches.
17 MR. DAVIS: You asked for comments, and you're
18 going to get them.
19 MR. MIRAGLIA: Thank you.
20 MR. DAVIS: I'm obviously winding down here.
21 The next slide, number 11, just says you've got to
22 do some analysis. You get a list of hundreds of items. You
23 don't do contingency planning for every one. If it's low
24 risk, low consequence, you don't plan for it; the high risk,
25 high consequence, you do plan for it. I leave in the yellow
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1 area because I'm having trouble convincing people that
2 engineering judgment is involved as part of this process;
3 it's not a PRA analysis; you've got to use some judgment.
4 CHAIRMAN JACKSON: Specific areas are put into
5 these boxes?
6 MR. DAVIS: There are a variety of schemes, but
7 you look at risk versus consequence.
8 CHAIRMAN JACKSON: What I am saying is these
9 things are populated with actual areas or systems.
10 MR. DAVIS: Or you have a table with a number.
11 You try to prioritize on the two scales.
12 CHAIRMAN JACKSON: What about the exercise of the
13 contingency plan? Is that built into what you are doing,

14 actually walking through or exercising the contingency plan?
15 MR. DAVIS: Yes. The final slide leads to that.
16 You've got to take all these individual elements that you've
17 developed for the components, wrap them up in an integrated
18 contingency plan, and that is what we are targeting to have
19 done as part of our overall program by July.
20 Then you have the execution phase. It involves
21 training, exercises and various other elements. If you look
22 at the manual, you will see that we actually have a section
23 in that form that says what action has to be taken, level of
24 training, exercise, and that kind of stuff, to exercise the
25 capability and train the people and if necessary order the
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1 spares, buy the extra radios, or whatever you want to do.
2 I just wanted to close with one final slide. It's
3 my opinion that we are going to be able to come to closure
4 on this year 2000 program and that in fact we will be able
5 to control the Y2K bug fairly handily. But as we have sort
6 of discussed, I think the "madness bug," and I picked that
7 up from a recent Time article, is becoming more of a problem
8 to us as we move through the rest of this year and how to
9 handle that. That is sort of beyond some of my technical
10 expertise and abilities.
11 CHAIRMAN JACKSON: Thank you very much. I'd like
12 to thank the staff and Mr. Davis.
13 I'd now like to call forward Mr. Paul Gunter from
14 the Nuclear Information and Resource Service, for a
15 presentation.
16 MR. GUNTER: I'd like to thank the Commission for
17 the opportunity and your flexibility to provide us with this
18 time, albeit late in the hour here.
19 CHAIRMAN JACKSON: That's all right. Our meetings
20 are always long.
21 MR. GUNTER: I know.
22 I think what we would like to do is just briefly
23 revisit the three petitions that are now before NRC with
24 regard to the rulemaking.
25 The first is to require compliance by December 1,
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1 1999. I think one of our concerns here is the issue of
2 readiness versus compliance that was raised by GAO in its
3 critique of General Letter 98-01.
4 It's apparent to us that there is an economic
5 driver here and that readiness does not necessarily equate
6 to compliance. I think it would be helpful if there was
7 some way to make the process more transparent in terms of
8 how economics is playing into this issue. Certainly there
9 are a number of other areas that we are aware of where
10 economics plays to the detriment. This is another example
11 we'd like to see some clarification on. I think that is
12 part of the purpose behind addressing this in a rulemaking.
13 CHAIRMAN JACKSON: Let me ask you this question.
14 Why is compliance vice readiness such a focus? What is it

15 that you see that readiness doesn't gain you from a public
16 health and safety point of view that compliance will?
17 MR. GUNTER: I'm coming at this from a lay
18 understanding. You'll have to bear with me here. My
19 understanding is that on December 31, 1999, with the
20 rollover compliance, it would provide that you roll over to
21 January 1, 2000.
22 In fact, it's my understanding that that is not
23 going to be the case in a number of systems, that you will
24 have patches or actually rollbacks, where you will roll back
25 to a date that has some suitability determination and

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1 analysis that determines that while it is not compliant,
2 there will be noted in the operator log that it's not 1982
3 or whatever the date is, but that the equipment will still
4 be reliable and operable.
5 I think what GAO addressed was that there needs to
6 be a more transparent and visible process for how the
7 utility made those determinations of suitability.
8 Certainly, I think the more that is out in the public arena,
9 the more independent review you have of those kinds of
10 suitability judgments.
11 The second petition would require annual emergency
12 drills only for the year 1999 at all reactors with a Y2K
13 component to exercise.
14 I think basically what our focus here is that we
15 were looking to a rule that would provide the broadest
16 experience for contingency planning, and that those drills
17 and the information gleaned from those drills could be put
18 into an NRC guidance document that would be put into each
19 and every one of the reactors' emergency operation centers
20 so that when we roll over to the year 2000 that there is a
21 log that would provide for an operator to go to an event
22 that is occurring, that was run through in a drill, and he
23 would have the experience of that drill; he would have the
24 expertise of another operator who went through that drill;
25 but this would be not on an unseen or unprepared for event.

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1 We have an opportunity to run through this drill
2 at 103 reactors and provide a very broad range of
3 contingency planning through the preparation of such a
4 guidance document.
5 CHAIRMAN JACKSON: You don't think that the Y2K
6 exercise that the staff described, the little curve that is
7 being planned, will accomplish that?
8 MR. GUNTER: I don't know that. I haven't seen
9 the extent to which staff is planning to run through the
10 number of events that would be covered and made available.
11 CHAIRMAN JACKSON: Maybe that information can be
12 shared.
13 MR. GUNTER: That would be helpful.
14 The third petition would require that all
15 emergency diesel generators be operable at the rollover date

16 and subsequent sensitive dates.
17 CHAIRMAN JACKSON: Is it not true that the
18 licensees are planning to in fact have their diesel
19 generators on? Is that true?
20 MR. GUNTER: This would raise a concern. Again, I
21 think that "operable" is the word here. If we look just
22 recently to the Fitzpatrick event, during that fire the
23 licensee turned the emergency diesel generators on in
24 advance of actual loss of offsite power, and subsequently in
25 a DER we learned that in fact that activity could or

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1 probably would -- I'm not exactly sure what the language was
2 in the DER -- but that it would have prevented, I think, the
3 loading of those safety buses, because you would have those
4 EDGs operating in advance of an actual loss of offsite
5 power.
6 CHAIRMAN JACKSON: I don't know that the
7 connectivity was there in the Fitzpatrick event. There was
8 an issue of loading the safety buses, but I don't know that
9 it had to do specifically with the EDGs being turned on
10 beforehand. I think the issue of the safety buses not
11 loading in this specific case of the Fitzpatrick event --
12 MR. GUNTER: Okay. I'd like to see clarification
13 on that.
14 CHAIRMAN JACKSON: You guys are my technical guys,
15 but that is my understanding, that it wasn't the fact that
16 the diesel generators, EDGs were on, that prevented the
17 loading. The issue about the safety buses not loading had
18 to do with a separate set of issues; is that correct?
19 MR. WERMEIL: That's my understanding.
20 CHAIRMAN JACKSON: Okay.
21 MR. GUNTER: I'll have to work that over with Dave
22 Lochbaum. He's my technical adviser.
23 CHAIRMAN JACKSON: All right.
24 MR. GUNTER: Again, I think the appendix that we
25 put together gave us some pause. In looking over the past

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1 two years of EDG events, we didn't share that 95 percent
2 level of confidence that NRC and the industry tout for the
3 emergency diesel generator turning on. Still, even with 95
4 percent reliability, that still leaves 5 percent out there
5 in question. That's why we have included an additional
6 request that there be some additional backup power because
7 of the uniqueness of this event and the possibility of
8 widespread disruptions, and that that be considered, and it
9 was placed in the rulemaking.
10 Additionally, that rulemaking request also would
11 provide that the irradiated fuel pools be reclassified to
12 class 1E systems so that they would be safety-related
13 systems with emergency power available at the time of loss
14 of offsite power.
15 I think the two questions that we have to NRC and
16 staff basically go back first to the staff memorandum dated

17 January 19th, which basically states that independent
18 verification and validation of Y2K readiness of remediated
19 mission-critical systems is important.
20 Additionally, the memo states that industry
21 reliance on vendor certification of Y2K susceptible systems
22 varies. However, NRC has determined that no regulatory
23 basis exists to require testing.
24 Given that a number of Y2K vulnerable systems,
25 while not classified as safety related or mission critical,

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1 can have impact on safety and operation, our question is,
2 how can the public safety be assured without the
3 verification and validation process available only through
4 independent testing of remediated susceptible systems?
5 Certainly we gain confidence by hearing that there
6 is some testing going on out there, but without knowledge of
7 the degree of testing, there still is this area of concern.
8 If you can shed some light on this, it would be helpful, but
9 certainly in the light that NRC doesn't claim to have a
10 regulatory basis for requiring such testing.
11 CHAIRMAN JACKSON: You are saying there needs to
12 be some knowledge of the degree of testing that is going on,
13 a verification and validation.
14 MR. GUNTER: Not only knowledge, but it would be
15 comforting to know that there was an enforcement level out
16 there.
17 COMMISSIONER McGAFFIGAN: Madam Chairman, should
18 we consider this a fourth petition for rulemaking?
19 I don't read it in your first three. There are no
20 words in your first three petitions about independent
21 verification.
22 MR. GUNTER: We can submit it.
23 COMMISSIONER McGAFFIGAN: I'm not looking for a
24 fourth.
25 [Laughter.]

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1 MR. GUNTER: Obviously there a lot of thought has
2 gone into this process between when our petitions were put
3 forward and certainly more questions will continue to come
4 to the fore as we move closer to the date. Hopefully, there
5 will be much more resolution than questions coming to the
6 fore. This is one area that came to light to us in terms of
7 the NRC's own response through it's January 19th memorandum.
8 Finally, in the interest of public safety, we
9 would like to know if the NRC can provide the public with
10 the knowledge of just how many irradiated fuel pools out
11 there are not currently hooked up to emergency power for
12 cooling capability. This is not only a concern of NIRS',
13 but UCS does share this concern with us in light of the fuel
14 pool issue.
15 So we would like to get some sense of just how
16 much uncertainty is out there in terms of providing
17 emergency power to the large inventories of radioactive

18 waste that are at each of these sites that currently would
19 begin to heat up in the event of a loss of offsite power.
20 COMMISSIONER McGAFFIGAN: Madam Chairman.
21 CHAIRMAN JACKSON: Please.
22 COMMISSIONER McGAFFIGAN: I'd like to ask a couple
23 of questions that follow up on a point that was made
24 earlier.
25 It's a little frustrating to get petitions for
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1 rulemaking on December 10, one of which cites 1/1/99 as a
2 critical date, that the rulemaking petition should be
3 granted by that date. It was stated earlier that NEI for
4 several years has had these meetings; NRC has dutifully
5 attended and worked with them; and others haven't attended.
6 When did you all start following this issue closely, and why
7 didn't we receive these petitions in 1997 or some date that
8 might be in the art of the possible to respond to them by
9 1/1/99, if indeed you wanted one of them in effect by
10 1/1/99?
11 MR. GUNTER: I think you have to understand that
12 we only have six people on staff and that there are a number
13 of issues out there. We deal with resource issues as well.
14 So part of it is dealing with and managing issues according
15 to available resources.
16 Again, we don't view these as controversial
17 petitions.
18 COMMISSIONER McGAFFIGAN: It strikes me, as one
19 Commissioner, that some of these things that you are asking
20 for here couldn't possibly have passed any sort of
21 cost-benefit analysis. We do have a backfit rule and all of
22 that. I'm not sure whether we will even get to that point.
23 A 60-day supply of fuel for emergency diesel generators.
24 There is nothing in your petition, for example, that
25 provides any justification for a 60-day supply. That is the
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1 one that was supposed to be in effect by 1/1/99. So they
2 would have had to have all run out in December and bought 60
3 days worth of fuel.
4 Is there a better way to have a dialogue with you
5 all than have three petitions for rulemaking come in on
6 December 10th and get you involved in these ongoing public
7 interactions that we have and ask questions?
8 A petition for rulemaking is a resource-intensive
9 process. We put it out for Federal Register Notice, as you
10 requested, more promptly than we normally do. We are
11 getting responses back. We'll analyze the responses. To
12 some degree that may not even serve your purpose if it
13 diverts resources from people who are trying to get the job
14 done and processing a bunch of paper.
15 Is there a way other than the rulemaking process
16 to constructively engage with us?
17 MR. GUNTER: I think that we would be interested
18 in opening that dialogue. We only have the resources that

19 are available. We become aware of the process through
20 participation. There is the 2.206 process as well, but I
21 think that we made an evaluation that this was a way of
22 engaging the public and opening the issues to dialogue,
23 albeit at a late date, but certainly we have opened up the
24 process and we have engaged the agency and the industry
25 through these petitions, and that was our intent.

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1 CHAIRMAN JACKSON: Let me kind of piggyback on
2 what Commissioner McGaffigan has raised. Have you had the
3 opportunity to review the NEI guidance for dealing with Y2K
4 and do you have any thoughts about whether there is anything
5 missing, et cetera?
6 MR. GUNTER: We have looked at the guidance
7 document. It's not our study, but we did review the GAO's
8 report. There were areas in the GAO letter of March '98
9 that did study the industry guidance and found it wanting,
10 particularly in areas of not necessarily providing enough
11 information to licensees on embedded chip systems, as well
12 as the GAO's recommendation that the regulator not have too
13 much reliance on this industry guidance document as well.
14 COMMISSIONER McGAFFIGAN: The only point I was
15 trying to make is I think there is a constructive way to
16 engage with us short of these formal processes, the 2.206 or
17 the rulemaking process. Those are two avenues, but you
18 mentioned UCS earlier.
19 Mr. Lochbaum, I think over the last couple of
20 years, has done wonderfully well in engaging us outside of
21 those processes. Millstone restart was not a formal
22 proceeding. He was invited to talk to the Commission. He
23 participated up there in our enforcement review. He has
24 been involved in the public dialogue, our new inspection and
25 assessment systems. He has been involved in the public

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1 dialogue not through petitions or rulemakings, but showing
2 up at these meetings and workshops and writing very powerful
3 and on the point letters evaluating, say, our escalated
4 enforcement actions over the last couple of years, or
5 evaluating the effectiveness of our level 4 enforcement
6 program, et cetera, et cetera.
7 He doesn't always agree with us. Occasionally he
8 does on level 4 enforcement; occasionally he doesn't on
9 Millstone restart.
10 But I think without using these formal processes,
11 which you are welcome to use, but these informal processes.
12 Appearing before ACRS. I think Mr. Lochbaum has engaged
13 them on PRA and how much faith we should have on PRA.
14 That was my only point. It is frustrating.
15 CHAIRMAN JACKSON: I think there is a way to
16 provide a context for this. We don't know all there is of
17 what your history has been in terms of NRC and having issues
18 that you feel affect public health and safety addressed in a
19 straightforward and fair way, but this Commission has taken

20 major steps to engage all of our stakeholders, not just the
21 nuclear industry, but in fact that is part of how
22 Mr. Lochbaum has come to be more directly involved in a
23 number of things but in a way that doesn't compromise what
24 his role is.
25 I think there is an opportunity for you or a
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1 representative of your group to be equally engaged.
2 Of course, if you don't feel that we are being
3 responsive or at least answering the questions, and
4 responsiveness may not always mean that we do exactly what
5 you may ask, that's true of the nuclear industry too. You
6 may have a different perspective, but that is certainly the
7 point of view that I have advanced, that we engage, and
8 being responsive doesn't mean we do exactly everything that
9 they want us to do.
10 I think that we would like to have more
11 participation and have you involved in the stakeholder
12 process so that you have on a more continuing basis an
13 opportunity to have us understand where your concerns are.
14 Even in the midst of that, you are still very welcome to
15 have petitions for rulemaking or any other kind, but I would
16 also urge and invite you to do that.
17 MR. GUNTER: I appreciate that. I believe it is a
18 two-way street that we are talking about here. Our
19 participation is facilitated by notification and by
20 invitation and a number of avenues.
21 CHAIRMAN JACKSON: That's a fair statement.
22 COMMISSIONER MERRIFIELD: I would just piggyback
23 on the comments of the Chairman and my fellow Commissioner.
24 I take it from your comments a lot of your concern is
25 generated out of the GAO document and that snapshot in time
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1 where the industry or perhaps we were. That document at
2 this point is almost a year old, and I think there has been
3 a lot of work, as we have heard today, both by our staff as
4 well as by the industry.
5 Are we where we should be? That's a decent
6 question and one which you and your limited staff can go
7 back and take a look at that. As the Commissioners have
8 encouraged you to become engaged on that, you've got
9 constructive work to help all of us move together to make
10 sure that when we do get to that time change it's done
11 right.
12 The other thing I would mention is we have our own
13 contingency plan that the agency has prepared so that we are
14 ready as well. I don't know whether you've had a chance to
15 look at that document, whether you have any comments.
16 Certainly I would encourage you, if you haven't, to have the
17 same kind of engagement with that document and our plans as
18 you do with the direction the utilities are going in.
19 CHAIRMAN JACKSON: I will ask the staff to make
20 sure that it reaches out in terms of a notification and

21 invitation to workshops and meetings, and we invite your
22 participation in the Commission meetings.
23 I heard what you said. It facilitates, it helps
24 you when you are really notified. Many of the things are on
25 the Web and/or in the Federal Register, but we can make a

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1 particular effort to ensure that you know when the various
2 meetings and workshops occur and that there is appropriate
3 sharing.
4 COMMISSIONER McGAFFIGAN: Madam Chairman, I think
5 that goes outside of this area.
6 CHAIRMAN JACKSON: That's right.
7 COMMISSIONER McGAFFIGAN: Lochbaum may have been
8 particularly effective at it the last couple of years. We
9 know what his list of interests are, and I think he gets
10 special invitations.
11 Indeed, we had a fiasco back in December where he
12 got the special invitation. We didn't get it on the Web
13 page and he didn't participate in the meeting, as was his
14 right, because he didn't feel he had been properly noticed,
15 although he personally had been properly noticed.
16 If we can get a list of items on which you want to
17 engage, I think we can do what we do for Mr. Lochbaum, make
18 sure you get outside of the Web page and these other formal
19 mechanism direct invitations.
20 CHAIRMAN JACKSON: And information as appropriate.
21 Certainly we can provide you an answer to a question of what
22 our regulatory basis or authority really allows us to do in
23 some of these areas as well as knowledge of the degree of
24 testing of these systems that occurs.
25 MR. GUNTER: I appreciate it.

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1 CHAIRMAN JACKSON: Anything else?
2 COMMISSIONER MERRIFIELD: I have a final comment.
3 I want to thank the Chairman for convening this meeting
4 today. This is obviously a very important issue and one I
5 think all the Commissioners, including me, are treating
6 very, very seriously. I think we as a Commission have gone
7 ahead with a contingency plan, which I think is a good one.
8 I think the staff is to be commended for that as well.
9 I personally would like to be very involved in the
10 exercises. Obviously the Chairman has the control over
11 those, but I would like to be an interested participant at a
12 minimum, because I think it's important.
13 CHAIRMAN JACKSON: Thank you.
14 On behalf of the Commission, I would like to thank
15 all of our speakers today. While the information presented
16 by the industry and the NRC staff is encouraging, the vexing
17 nature of it demands that we remain focused and vigilant.
18 Indeed, as Chairman Koskinen pointed out in his
19 testimony before the House Committee on Government Reform
20 last month, "You are never really done" preparing for Y2K.
21 Mr. Gunter's sobering observations also provide a

22 useful counter to any inclination to become complacent.
23 As I mentioned in my opening remarks, I would like
24 to go back to this issue of the failure of a plant computer
25 this week at one of our nuclear plants. I mentioned the
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1 good news, and I repeat it.
2 One, the problem was identified.
3 Two, it was identified as a consequence of
4 testing.
5 Three, it did not affect an active safety system
6 such as the reactor protection system.
7 And four, the plant stayed on line.
8 This occurrence highlights, though, the need to
9 analyze, remediate and validate early so that multiple
10 failures do not occur simultaneously. It always points out
11 that, as always, and you hear me say this all the time,
12 results are what matter. Results are what matter.
13 I had someone tell me that, oh, well, this is like
14 any software glitch. We know that software has mistakes.
15 But no amount of analytical elegance will obviate the need
16 for thorough testing.
17 I would encourage the staff and the nuclear
18 industry to remain mindful of this as confidence in the
19 ability of our licensees to pass through the turn of the
20 century unaffected increases over time.
21 There is one other point that became evident
22 through the course of the international workshop that I
23 attended, and that was the degree to which some countries
24 are unprepared for Y2K. Someone said that contingency
25 planning is no substitute for actual remediation, but I have
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1 said this, and I'll say it here. It would appear that in
2 fact contingency planning may, for those countries, and
3 maybe should, require the greatest emphasis, as insufficient
4 time may remains to approach the problem in a measured way,
5 in the way that the U.S. industry and the NRC has.
6 It therefore underscores the imperative to
7 maintain our focus and to complete our own preparations as
8 expeditiously as we can, because it will help to protect us
9 from having to become reactive and allow us to be a model
10 and supply help to the international community.
11 Once again -- he's not here -- I would like to
12 thank Chairman Koskinen; I would like to thank our own
13 staff, Mr. Giitter, Mr. Wermeil, Mr. Miraglia; thank
14 Mr. Davis from the Nuclear Energy Institute; and Mr. Gunter
15 from the Nuclear Information and Resource Service for
16 participating in today's meeting.
17 Unless there are any final comments, we are
18 adjourned.
19 [Whereupon, at 11:36 a.m., the briefing was
20 concluded.]
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IN RESPONSE, PLEASE
REFER TO: M990211B

March 12, 1999

MEMORANDUM	William D. Travers
TO:	Executive Director for Operations
FROM:	Annette Vietti-Cook, Secretary /s/
SUBJECT:	STAFF REQUIREMENTS - BRIEFING ON Y2K ISSUES (SECY-99-003), 9:00 A.M., THURSDAY, FEBRUARY 11, 1999, COMMISSIONERS' CONFERENCE ROOM, ONE WHITE FLINT NORTH, ROCKVILLE, MARYLAND (OPEN TO PUBLIC ATTENDANCE)

The Commission was briefed by the President's Council on the Year 2000 Conversion, the NRC staff, the Nuclear Energy Institute, and the Nuclear Resource and Information Service (NIRS) on the preparations and contingency plans for dealing with the year 2000 computer issue. The Commission urged the staff to keep the Resident Inspectors informed and involved in the Y2K issues since they will be key players in the contingency plans.

The Commission extended an invitation to NIRS to become more involved in NRC's stakeholder process. The staff should initiate a dialogue with NIRS to identify its issues of concern in order to facilitate enhanced notification and participation opportunities in NRC public meetings, workshops, and Commission meetings.

(EDO) (SECY Suspense: 3/26/99)

cc: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CFO
CIO
OCA
OIG
OPA
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR - Advance
DCS - P1-17

SECY-99-003

January 6, 1999

FOR: The Commissioners
FROM: William D. Travers /s/
Executive Director for Operations
SUBJECT: PROPOSED SUPPLEMENT 1 TO NRC GENERIC LETTER 98-01, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

PURPOSE:

To inform the Commission of the staff's intent to issue the attached Supplement 1 to NRC Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." The purpose of this supplemental generic letter is to provide nuclear power plant licensees with a voluntary alternative response to item (2) of the required responses to GL 98-01 on the Year 2000 (Y2K) readiness of their facilities. This action is consistent with the Nuclear Energy Institute's (NEI) recommendation as stated in the letter from Joe Colvin, Chairman and CEO, NEI, dated November 9, 1998, to the Chairman, NRC. The alternative response would provide information on the overall Y2K readiness of the plant consistent with the Year 2000 Information and Readiness Disclosure Act (Public Law No: 105-271). Under this alternative response, licensees would provide information about the Y2K readiness of those systems covered by GL 98-01, but in addition, the Y2K readiness of those systems necessary for continued plant operation which are not covered by the terms and conditions of the license and NRC regulations.

DISCUSSION:

As discussed in GL 98-01, the Y2K problem pertains to the potential for date-related problems in computer systems such as the inability of the software to recognize the "00" digits as the year 2000 rather than 1900 and thereby interfere with the proper operation of these systems. As indicated in GL 98-01, because the use of computers in nuclear power plant safety-related systems is limited, the greatest impact of the Y2K problem is on systems required for continued plant operation. Such systems include security computers, control systems, radiation monitoring systems, plant process and data collection computers, and engineering programs.

Contact: Jared S. Wermiel, NRR
(301) 415-2821

From the beginning of the efforts to address the Y2K problem, both the NRC and nuclear power industry recognized the importance of the concern not only on plant safety but on the ability of the plant to continue to operate to support the grid and the nation's electric power infrastructure. Nuclear power plant Y2K readiness programs and NRC staff oversight efforts have focused on both aspects of nuclear power plant operations. This focus was reinforced by enactment of the Year 2000 Information and Readiness Disclosure Act on October 19, 1998, which encourages broad information exchanges on the Y2K problem as a means of achieving readiness of all the nation's infrastructure sectors on January 1, 2000.

In keeping with the spirit of the Year 2000 Information and Readiness Disclosure Act, the staff believes it is desirable to obtain information on the status of nuclear power plant Y2K readiness beyond the current (more narrowly focused) response in item (2) of GL 98-01. The proposed Supplement 1 to GL 98-01 requests a voluntary alternative response to GL 98-01 item (2) in which licensees by July 1, 1999,

will report on the Y2K readiness status of the entire facility including its ability to continue to operate on January 1, 2000. Licensees are reminded, however, in Supplement 1 to GL 98-01 that existing reporting requirements under 10 CFR Part 21, 10 CFR 50.72 ,10 CFR 50.73 and 10 CFR 50.9 are still applicable as appropriate. These provisions should be sufficient to assure the integrity of all safety significant information provided notwithstanding that the staff is not, in this supplement, asking that the responses be submitted under oath or affirmation.

The Committee to Review Generic Requirements (CRGR) has agreed that CRGR review of the proposed draft Supplement 1 to GL 98-01 is not required.

The Office of the General Counsel has reviewed this generic letter supplement and has no legal objection to its contents. Furthermore, the Office of Management and Budget has confirmed that the proposed generic letter supplement is a non-major "rule" under the provisions of the Small Business Regulatory Enforcement Fairness Act (see 5 U.S.C., Chapter 8), enacted March 29, 1996.

The Chief Information Officer had no objection to the issuance of the proposed generic letter supplement.

The staff intends to issue the generic letter supplement approximately 5 working days after the date of this information paper.

William D. Travers
Executive Director for Operations

Attachments:
1. Proposed Supplement 1 to GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"
2. Associated Press Release on Supplement 1 to GL 98-01

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U. S. NUCLEAR REGULATORY COMMISSION

SECY-98-094

May 1, 1998

FOR: The Commissioners
FROM: L. Joseph Callan /s/
Executive Director for Operations
SUBJECT: PROPOSED NRC GENERIC LETTER 98-XX, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

PURPOSE:

To inform the Commission of the staff's intent to issue the attached generic letter. The purpose of the generic letter is to request nuclear power plant (NPP) licensees to provide the following information regarding their programs, planned or implemented, to address the Year 2000 (Y2K) problem in computer systems at their facilities: (1) written confirmation of implementation of the programs and (2) written certification that the facilities are Y2K ready with regard to compliance with the terms and conditions of their licenses and NRC regulations.

A copy of the proposed generic letter is attached.

DISCUSSION:

Simply stated, the Y2K computer problem pertains to the potential for date-related problems that may be experienced by a computer system or application. These problems include not representing the year properly, not recognizing leap years, and improper date calculations. An example of a date-related problem is the potential misreading of "00" as the year 1900 rather than 2000. The Y2K problem has the potential to interfere with the proper operation of computer systems, hardware that is microprocessor-based (embedded software), and software or databases relied upon at NPPs. Furthermore, there is a risk that affected plant systems and equipment may fail to function properly. Consequently, the Y2K problem could result in a plant trip and subsequent complications in tracking post-shutdown plant status and recovery due to a loss of emergency data collection.

The Y2K problem is urgent because it has a fixed deadline. This matter requires priority attention because of the limited time remaining, the uncertain risk that the problem presents, the technical challenges presented, and the scarcity of resources available to correct the problem.

Existing reporting requirements under 10 CFR Part 21, 10 CFR 50.72, and 10 CFR 50.73 provide for notification of the NRC staff of deficiencies, non-conformances, and failures, such as those that could result from the Y2K problem in safety-related systems. To date, the NRC staff has not identified or received notification from licensees or vendors of digital protection systems that a Y2K problem exists with safety-related initiation and actuation systems. However, problems have been identified in non-safety, but important, computer-based systems. Such systems, primarily databases and data collection processes necessary to satisfy NRC regulations, license conditions, and technical specifications that are date driven, may need to be modified for Y2K compliance.

The following NRC regulations form the basis for requesting information from NPP licensees regarding their programs to address the Y2K problem in computer systems at their facilities required by the NPP

license or NRC regulations:

- 10 CFR 50.36, "Technical Specifications," paragraph (c)(3), "Surveillance Requirements," and paragraph (c)(5), "Administrative Controls." These paragraphs relate, respectively, to requirements pertaining to testing, calibration, or inspection to ensure that the necessary quality of systems and components is maintained and to the provisions for management, procedures, recordkeeping, and review and audit necessary to ensure operation of the facility in a safe manner.

- 10 CFR 50.47, "Emergency Plans," paragraph (b)(8), relates to the provision and maintenance of adequate emergency facilities and equipment to support emergency responses.

- Appendix B to 10 CFR Part 50, Criterion III, "Design Control," requires among other things that design control measures provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

- Appendix B to 10 CFR Part 50, Criterion XVII, "Quality Assurance Records," requires that sufficient records be maintained to furnish evidence of activities affecting quality. The records are to include operating logs and results of reviews.

- Appendix E to 10 CFR Part 50, Section VI, "Emergency Response Data System," relates to the provision and maintenance of licensee links to the Emergency Response Data System.

In addition, to the extent that the general design criteria (GDCs) of Appendix A to 10 CFR Part 50 are applicable to a power reactor facility, the following criteria also provide a basis for the request:

- GDC 13, "Instrumentation and Control," addresses the provision of appropriate instrumentation and controls to monitor and control systems and variables during normal operation, anticipated operational occurrences, and accident conditions as appropriate to ensure adequate safety.

- GDC 19, "Control Room," requires the provision of a control room from which actions can be taken to operate the nuclear plant safely.

- GDC 23, "Protection System Failure Modes," requires that the protection system be designed to fail into a safe state or into a state demonstrated to be acceptable on some other defined basis.

To alert NPP licensees to the Y2K problem, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the staff described the potential problems that NPP computer systems and software may encounter as a result of the change to the new century and how the Y2K issue may affect NRC licensees. In IN 96-70, the staff encouraged licensees to examine their uses of computer systems and software well before the turn of the century and suggested that licensees consider appropriate actions to examine and evaluate their computer systems for Y2K vulnerabilities. The NRC staff also incorporated recognition of the Y2K concern in the updated

Standard Review Plan, NUREG-0800, Chapter 7, "Instrumentation and Control," dated August 1997, which contains guidance for the staff's review of computer-based instrumentation and control systems.

However, on the basis of interactions with the industry, the staff determined that additional assurance that licensees were pursuing the Y2K problem was needed. On this basis, the staff decided to issue the attached generic letter. A notice of opportunity for public comment on the proposed draft generic letter was published in the *Federal Register* on January 29, 1998. Comments were received from 16 licensees, 2 industry groups, 5 individuals, and the General Accounting Office. Copies of the comments received are available in the NRC Public Docket Room (PDR). A copy of the staff's evaluation of these comments can be found in the NRC Central Files and will be made available in the PDR after the final generic letter is issued. The comments resulted in changes to the proposed draft generic letter to provide clarification but did not change the original intent of the generic letter or the actions requested of NRC licensees.

The Committee To Review Generic Requirements (CRGR) reviewed the proposed draft generic letter during its meeting (Number 313) on January 13, 1998. The staff incorporated the comments provided by CRGR at that meeting. The CRGR reviewed the proposed final generic letter during its meeting (Number 318) on April 17, 1998, and has endorsed the generic letter.

The Office of the General Counsel has reviewed this generic letter and has no legal objections to its content. Furthermore, the Office of Management and Budget has confirmed that the proposed generic letter is a non-major "rule" under the provisions of the Small Business Regulatory Enforcement Fairness Act (see 5 U.S.C., Chapter 8), enacted March 29, 1996.

The Chief Information Officer has no objection to the issuance of the proposed generic letter.

The staff intends to issue this generic letter approximately 5 working days after the date of this information paper.

L. Joseph Callan
Executive Director for Operations

CONTACT: Matthew Chiramal, NRR
301-415-2845; E-mail: mxc

Attachment: Proposed Generic Letter 98-xx, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

ATTACHMENT

[For the final version of this document, see NRC Generic Letter 98-01]

NRC GENERIC LETTER NO. 98-XXX: **YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS**

Addressees

All holders of operating licenses for nuclear power plants, except those who have permanently ceased

operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this generic letter to require that all addressees provide the following information regarding their programs, planned or implemented, to address the year 2000 (Y2K) problem in computer systems at their facilities: (1) written confirmation of implementation of the programs and (2) written certification that the facilities are Y2K ready with regard to compliance with the terms and conditions of their licenses and NRC regulations.

Description of Circumstances

Simply stated, the Y2K computer problem pertains to the potential for date-related problems that may be experienced by a system or an application. These problems include not representing the year properly, not recognizing leap years, and improper date calculations. An example of a date-related problem is the potential misreading of "00" as the year 1900 rather than 2000. These problems can result in the inability of computer systems to function properly by providing erroneous data or failing to operate at all. The Y2K problem has the potential of interfering with the proper operation of computer systems, hardware that is microprocessor-based (embedded software), and software or databases relied upon at nuclear power plants. Consequently, the Y2K problem could result in a plant trip and subsequent complications on tracking post-shutdown plant status and recovery due to a loss of emergency data collection.

The Y2K problem is urgent because it has a fixed deadline. It requires priority attention because of the limited time remaining, the uncertain risk that the problem presents, the technical challenges presented, and the scarcity of resources available to correct the problem.

Existing reporting requirements under 10 CFR Part 21, 10 CFR 50.72, and 10 CFR 50.73 provide for notification to the NRC staff of deficiencies and non-conformances, and failures, such as some of those which could result from the Y2K problem in safety-related systems. To date, the NRC staff has not identified or received notification from licensees or vendors that a Y2K problem exists with safety-related initiation and actuation systems. However, problems have been identified in non-safety, but important, computer-based systems. Such systems, primarily databases and data collection processes necessary to satisfy license conditions, technical specifications, and NRC regulations that are date driven, may need to be modified for Y2K compliance.

Some examples of systems and computer equipment that may be affected by Y2K problems follow:

- Security computers
- Plant process (data scan, log, and alarm and safety parameter display system computers
- Emergency response systems
- Radiation monitoring systems
- Dosimeters and readers
- Plant simulators
- Engineering programs
- Communication systems
- Inventory control systems
- Surveillance and maintenance tracking systems

- Control systems

To alert nuclear power plant licensees to the Y2K problem, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the NRC staff described the potential problems that nuclear power plant computer systems and software may encounter as a result of the change to the new century and how the Y2K issue may affect NRC licensees. In IN 96-70, the NRC staff encouraged licensees to examine their uses of computer systems and software well before the turn of the century and suggested that licensees consider appropriate actions for examining and evaluating their computer systems for Y2K vulnerabilities. The NRC staff also incorporated recognition of the Y2K concern in the updated Standard Review Plan, NUREG-0800, Chapter 7, "Instrumentation and Control," dated August 1997, which contains guidance for the NRC staff's review of computer-based instrumentation and control systems.

At the Nuclear Utilities Software Management Group (NUSMG) Year 2000 Workshop, an industry workshop held in July 1997, some nuclear power plant licensees described their Y2K programs and gave examples of areas in which they had addressed Y2K issues in order to ensure the safety and operability of their plants on and after January 1, 2000. Some of the issues discussed were (1) the evaluation of the impact of the Y2K problem on plant equipment, (2) the assessment process involved in the identification of Y2K-affected components, vendors, and interfaces, (3) the development of Y2K testing strategies, and (4) the identification of budget needs to address the Y2K problem.

The Nuclear Energy Institute (NEI) met with NUSMG and nuclear plant utility representatives in August 1997 to formulate an industry-wide plan to address the Y2K issue. On October 7, 1997, representatives of NEI and NUSMG met with the NRC staff to discuss the actions NEI was taking to help utilities make their plants "Year 2000 ready." NEI presented a framework document that provides guidance for utilities to use in readying for the Year 2000. The framework document makes a distinction in terminology between "Y2K ready" and "Y2K compliant." "Y2K compliant" is defined as computer systems or applications that accurately process date/time data (including but not limited to calculating, comparing, and sequencing) from, into, and between the 20th and 21st centuries, the years 1999 and 2000, and leap-year calculations. "Y2K ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system or application is not fully Y2K compliant. (These definitions have been adopted by the NRC for purposes of this generic letter.)

NEI/NUSMG issued the framework document NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," to all licensees in November 1997. The document recommends methods for nuclear utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license. The scope of NEI/NUSMG 97-07 includes software, or software-based systems or interfaces, whose failure (due to the Y2K problem) would (1) prevent the performance of the safety function of a structure, system, or component or (2) degrade, impair, or prevent compliance with the nuclear facility license and NRC regulations.

Discussion

Diverse concerns are associated with the potential impact of the Y2K problem on nuclear power plants because of the variety and types of computer systems in use. The concerns result from licensees' reliance upon (1) software to schedule maintenance and technical specification surveillance, (2) programmable

logic controllers and other commercial off-the-shelf software and hardware, (3) digital process control systems, (4) software to support facility operation, (5) digital systems for collection of operating data, and (6) digital systems to monitor post-accident plant conditions. The scope of NEI/NUSMG 97-07 includes the broad range of computers and software-based systems in a nuclear power plant. However, NRC Y2K concerns are limited to safety-related systems and other systems required by the nuclear power plant license or NRC regulations.

One application that is common to all power reactor licensees is the link between plant computers and the NRC's Emergency Response Data System (ERDS). This application performs the communication and data transmission functions that provide near real-time data availability to NRC and State incident response personnel during declared emergencies. The NRC is currently performing Y2K-related upgrades to ERDS, which will maintain the same communication protocol as the current system, with the exception that either 2-digit- or 4-digit-year fields will be accepted. Those licensees that anticipate changes to their ERDS link should allow time in their schedules for retesting their systems. NRC contractors will support requests for testing on a "first-come, first-served" basis.

NEI/NUSMG 97-07 suggests a strategy for developing and implementing a nuclear utility Y2K program. The strategy recognizes management, implementation, quality assurance (QA) measures, regulatory considerations, and documentation as the fundamental elements of a successful Y2K project. The document contains examples currently in use by licensees and also recommends that the Y2K program be administered using standard project management techniques.

The recommended components for management planning are management awareness, sponsorship, project leadership, project objectives, the project management team, the management plan, project reports, interfaces, resources, oversight, and QA. The suggested phases of implementation are awareness, initial assessment (which includes inventory, categorization, classification, prioritization, and analysis of initial assessment), detailed assessment (including vendor evaluation, utility-owned or utility-supported software evaluation, interface evaluation, and remedial planning), remediation, Y2K testing and validation, and notification.

The QA measures specified in NEI/NUSMG 97-07 apply to project management QA and implementation QA. Regulatory considerations include the performance of appropriate reviews, reporting requirements, and documentation. Documentation of Y2K program activities and results includes documentation requirements, project management documentation, vendor documentation, inventory lists, checklists for initial and detailed assessments, and record retention. NEI/NUSMG 97-07 also contains examples of various plans and checklists as appendices, which may be used or modified to meet the licensee's specific needs and/or requirements.

It should be recognized that NEI/NUSMG 97-07 is programmatic and does not fully address all the elements of a comprehensive Y2K program. In particular, augmented guidance in the area of risk management, business continuity and contingency planning, and remediation of embedded systems is needed to fully address some Y2K issues that may arise in licensee program implementation. The NRC staff believes that the guidance in NEI/NUSMG 97-07, when properly augmented and implemented, presents an example of one possible approach for licensees when addressing the Y2K problem at nuclear power plant facilities.

Another document that provides a useful overview of the elements of an effective Y2K program is a guide issued by the Accounting and Information Management Division (AIMD), U.S. General

Accounting Office (GAO), GAO/AIMD-10.1.14, "Year 2000 Computing Crisis: An Assessment Guide," September 1997. This guide is a distillation of the best practices of the Government and the private sector for dealing with the Y2K problem.

It should be noted that the guidance in NEI/NUSMG 97-07 and GAO/AMID-10.1.14 provides a framework only. Any Y2K program employed at a nuclear facility must be tailored to meet the specific needs and requirements of that facility and should, in general, be composed of the following phases: awareness, assessment, remediation, validation, and implementation. Completion of the Y2K program means the attainment of the program objectives, which could range from all computer systems and applications, including embedded systems, being Y2K compliant, to some being Y2K compliant and the remaining retired or with permanent and/or temporary compensatory measures or work-arounds in place. Also to be considered are the future maintenance requirements for keeping the systems and applications Y2K ready, for example, when the "fixed date window" approach is used.

It is recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could potentially affect the facility adversely. Therefore, to ensure continued safe operation of the facility into the Year 2000 and beyond, contingency plans should be formulated for affected systems and equipment. The concept of Y2K readiness includes the planning, development, and implementation of appropriate contingency plans or compensatory actions for items that are not expected to be Y2K compliant or ready and to address the possible impact of unidentified items and their effect on safe plant operation.

Because of the limited time remaining in which to address the Y2K problem, at some facilities it may be necessary that some remediation and implementation activities be performed during normally scheduled plant outages in order to avoid additional outages to effect these activities. Hence, licensees should plan for this work accordingly. The NRC staff notes that unless the majority of the Y2K program remediation, validation, and implementation activities are completed at a facility by mid -1999, leaving only a few such activities scheduled for the third and fourth quarters of 1999, the facility may not be Y2K ready by the year 2000.

In the course of implementing the Y2K program, problems could be identified that potentially affect the licensing basis of the plants. In certain cases, license amendments may be needed to address the problem resolution. Licensees should plan to submit such license amendments to the NRC on a timely basis. The utility Y2K programs and schedules should have the flexibility to accommodate such an eventuality. In addition,licensees are reminded that any changes to their facilities that affect their current licensing basis must be reviewed in accordance with existing NRC requirements and the change properly documented. Finally, we strongly encourage licensees to share information regarding identified remediation and implementation activities in order to maintain the likelihood that all Y2K problems are identified. We understand that Owners' Groups are implementing this and we encourage this effort.

Required Response

In order to gain the necessary assurance that addressees are effectively addressing the Y2K problem with regard to compliance with the terms and conditions of their licenses and NRC regulations, the NRC staff requires that all addressees submit a written response to this generic letter as follows:

(1) Within 90 days of the date of this generic letter, submit a written response indicating whether or not you have pursued and are continuing to pursue a Y2K program as, or similar to, that outlined in NEI/NUSMG 97-07, augmented appropriately in the areas of risk management, contingency planning, and remediation of embedded systems. If your program significantly differs from the NEI/NUSMG guidance, present a brief description of the programs that have already been completed, are being conducted, or are planned to ensure Y2K readiness of the computer systems at your facility(ies). This response must address the program's scope, assessment process, plans for corrective actions (including testing and schedules), QA measures, contingency plans, and regulatory compliance.

(2) Upon completing your Y2K program or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready, or will be Y2K ready, by the year 2000 with regard to compliance with the terms and conditions of your license(s) and NRC regulations. If your program is incomplete as of that date, your response must contain a status report, including completion schedules, of work remaining to be done to confirm your facility is/will be Y2K ready by the year 2000.

Address the written reports to the U.S. Nuclear Regulatory Commission, Attention: Document Control Desk, Washington, D.C. 20555-0001, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act 1954, as amended, and 10 CFR 50.54(f). In addition, submit a copy to the appropriate regional administrator.

Backfit Discussion

This generic letter requires information from addressees under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). The required information will enable the staff to verify that each nuclear power plant licensee is implementing an effective plan to address the Y2K problem and provide for safe operation of the facility before January 1, 2000, and is in compliance with the terms and conditions of their license(s) and NRC regulations. The following NRC regulations form a basis for this requirement:

- 10 CFR 50.36, "Technical Specifications," paragraph (c)(3), "Surveillance Requirements," and paragraph (c) (5), "Administrative controls." These sections relate, respectively, to requirements pertaining to testing, calibration, or inspection to ensure that the necessary quality of systems and components is maintained and to provisions relating to management, procedures, recordkeeping, and review and audit necessary to ensure operation of the facility in a safe manner.

- 10 CFR 50.47, "Emergency Plans," paragraph (b)(8), which relates to the provision and maintenance of adequate emergency facilities and equipment to support the emergency responses.

- Appendix B to 10 CFR Part 50, Criterion III, "Design Control," requires that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

- Appendix B to 10 CFR Part 50, Criterion XVII, "Quality Assurance Records," requires that sufficient records shall be maintained to furnish evidence of activities affecting quality. The

records are to include operating logs and the results of reviews.

- Appendix E to 10 CFR Part 50, Section VI, "Emergency Response Data System," which relates to the provision and maintenance of licensee links to the ERDS.

- Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 13, "Instrumentation and Control," which addresses the provision of appropriate instrumentation and controls to monitor and control systems and variables during normal operation, anticipated operational occurrences, and accident conditions, as appropriate, to ensure adequate safety.

- Appendix A to 10 CFR Part 50, GDC 19, "Control Room," which requires the provision of a control room from which actions can be taken to operate the nuclear plant safely.

- Appendix A to 10 CFR Part 50, GDC 23, "Protection System Failure Modes," which requires that the protection system shall be designed to fail into a safe state or into a state demonstrated to be acceptable on some other defined basis.

Paperwork Reduction Act Statement

This generic letter contains information collections that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB), approval number 3150-0011, which expires on September 30, 2000.

The public reporting burden for this collection of information is estimated to average 100 hours per response, including the time for reviewing the instructions, searching data sources, gathering and maintaining the needed data, and completing and reviewing the information collected. This estimate assumes a licensee's response simply conirms the existence of a Y2K program, similar to that outlined in NEI/NUSMG 97-07, and that the program will be completed by July 1, 1999. Licensees whose Y2K program significantly differs from the NEI/NUSMG guidance or whose Y2K program will not be completed by July 1, 1999, must submit additional information to the NRC.

The NRC is seeking public comment on the potential impact of the collection of information contained in this generic letter and on the following issues:

1. Is the proposed collection of information necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?

1. Is the estimate of burden accurate?

2. Is there a way to enhance the quality, utility, and clarity of the information to be collected?

3. How can the burden of the collection of information be minimized, including the use of automated collection techniques?

Send comments on the burden estimate and any aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, T-6 F33, U.S.

Nuclear Regulatory Commission, Washington, D.C. 20555-0001, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, D.C. 20503.

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

If you have any questions about this matter, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Jack W. Roe, Acting Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical Contact: M. Chiramal, NRR
301-415-2845
E-mail: mxc@nrc.gov

Lead Project Manager: Allen G. Hansen, NRR
301-415-1390
agh@nrc.gov

Attachment: List of Recently Issued NRC Generic Letters

NUCLEAR REGULATORY COMMISSION
Proposed Generic Communication
YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS (MA0138)

AGENCY: Nuclear Regulatory Commission

ACTION: Notice of opportunity for public comment

SUMMARY:

The Nuclear Regulatory Commission (NRC) is proposing to issue a generic letter to all holders of operating licenses for nuclear power plants, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel, to require that all addressees provide certain information regarding their programs, planned or implemented, to address the Year 2000 (Y2K) problem in computer systems at their facilities. In particular, addressees are being asked to provide written confirmation of implementation of the programs, and written certification that their facilities are Y2K ready and in compliance with the terms and conditions of their licenses and NRC regulations. This information is being requested under 10 CFR 50.54(f).

The NRC is seeking comment from interested parties on both the technical and regulatory aspects of the proposed generic letter presented under the Supplementary Information heading. In this regard, the NRC encourages the industry to propose a viable alternative to the generic letter as a means of providing the necessary assurance to the NRC that licensees are effectively addressing the Y2K problem in computer systems at their facilities. Such an alternative could consist of a voluntary initiative on the part of the nuclear power industry to obtain licensee inputs and communicate its findings to the NRC.

The proposed generic letter has been endorsed by the Committee to Review Generic Requirements (CRGR). Relevant information that was sent to the CRGR will be placed in the NRC Public Document Room. The NRC will consider comments received from interested parties in the final evaluation of the proposed generic letter. The NRC's final evaluation will include a review of the technical position and, as appropriate, an analysis of the value/impact on licensees. Should this generic letter be issued by the NRC, it will become available for public inspection in the NRC Public Document Room.

DATES:

Comment period expires *[30 days after FRN is published]*. Comments submitted after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except for comments received on or before this date.

ADDRESSEES:

Submit written comments to Chief, Rules and Directives Branch, Division of Administrative Services, U.S. Nuclear Regulatory Commission, Mail Stop T6-D69, Washington, DC 20555-0001. Written comments may also be delivered to 11545 Rockville Pike, Rockville, Maryland, between 7:45 am to 4:15 pm, Federal workdays. Copies of written comments received may be examined at the NRC Public Document Room, 2120 L Street, N.W. (Lower Level), Washington, D.C.

FOR FURTHER INFORMATION, CONTACT:

Matthew Chiramal, (301) 415-2845

SUPPLEMENTARY INFORMATION:
Proposed Generic Letter

Dated at Rockville, Maryland, this 23rd day of January 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Jack W. Roe, Acting Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

7590-01 (P)

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NRC GENERIC LETTER NO. 98-XX:
YEAR 2000 READINESS OF COMPUTER SYSTEMS
AT NUCLEAR POWER PLANTS

Addressees:

All holders of operating licenses for nuclear power plants, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this generic letter to require that all addressees provide the following information regarding their programs, planned or implemented, to address the Year 2000 (Y2K) problem in computer systems at their facilities: (1)written confirmation of implementation of the programs, and (2) written certification that the facilities are Y2K ready and in compliance with the terms and conditions of their licenses and NRC regulations.

Description of Circumstances

Simply stated the Y2K computer problem pertains to the potential inability of computers to correctly recognize dates beyond the current century, i.e., beginning with January 1, 2000 and beyond. The problem results from computer hardware or software that uses two-digit fields to represent the year. If the Y2K problem is not corrected, computer systems will be unable to recognize the change in century and will misread "00," for the year 2000, as 1900. The Y2K problem has the potential to interfere with the proper operation of any computer system, any hardware that is microprocessor-based (embedded software), and any software or database at nuclear power plants. As a consequence, there is a risk that affected plant systems and equipment will fail to function properly.

The Y2K problem is urgent because it has a fixed, non-negotiable deadline. This matter requires priority attention because of the limited time remaining to assess the magnitude of the problem, its associated technical and cost risks, and resource availability, and to implement programs that will achieve satisfactory resolution.

Existing reporting requirements under 10 CFR Part 21, 10 CFR 50.72, and 10 CFR 50.73 provide for notification to the NRC staff of deficiencies, non-conformance and failures, such as the Y2K problem in safety-related systems. To date, the NRC staff has not identified nor received notification from licensees or vendors of digital protection systems (e.g., Westinghouse, General Electric, Combustion Engineering, Foxboro, Allen Bradley, or Framatome/Babcock & Wilcox) that a Y2K problem exists with safety-related initiation and actuation systems. However, problems have been identified in non-safety, but important, computer-based systems. Such systems, primarily databases and data collection processes necessary for plant operation that are date driven, may need to be modified for Y2K compliance. Some examples of systems and computer equipment that may be affected by Y2K problems follow:

- Security computers
- Plant process (data scan, log, and alarm and safety parameter display system computers
- Emergency response systems
- Radiation monitoring systems
- Dosimeters and readers

- Plant simulators
- Engineering programs
- Communication systems
- Inventory control systems
- Surveillance and maintenance tracking systems
- Control systems

To alert nuclear power plant licensees to the Y2K problem, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70 the staff described the potential problems that nuclear power plant computer systems and software may encounter as a result of the change to the new century and how the Y2K issue may affect NRC licensees. In IN 96-70 the staff encouraged licensees to examine their uses of computer systems and software well before the turn of the century and suggested that licensees consider actions appropriate to examine and evaluate their computer systems for Y2K vulnerabilities. The NRC staff also incorporated recognition of the Y2K concern in the updated Standard Review Plan (SRP), NUREG-0800, Chapter 7, "Instrumentation and Control," dated August 1997, which contains guidance for staff review of computer-based instrumentation and control systems.

At the Nuclear Utilities Software Management Group (NUSMG) Year 2000 Workshop, an industry workshop held in July 1997, nuclear power plant licensees described their Y2K programs, and gave examples of areas in which they addressed Y2K issues in order to ensure the safety and operability of their plants on January 1, 2000. Some of the issues discussed were the (1) evaluation of the impact of the Y2K problem on plant equipment, (2) assessment process involved in the identification of Y2K affected components, vendors, and interfaces, (3) development of Y2K testing strategies, and (4) identification of budget needs to address the Y2K problem.

The Nuclear Energy Institute (NEI) met with NUSMG and nuclear plant utility representatives in August 1997 to formulate an industry-wide plan to address the Y2K issue. On October 7, 1997, representatives of NEI and NUSMG met with the NRC staff to discuss actions NEI was taking to help utilities make their plants "Year 2000 ready." NEI was preparing a framework document with guidance for utility use in readying for the Year 2000. The framework document makes a distinction in terminology between "Y2K readiness" ("Y2K Ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system or application is not fully Y2K Compliant) and "Y2K compliance" ("Y2K Compliant" is defined as computer systems or applications that accurately process date/time data (including but not limited to, calculating, comparing, and sequencing) from, into and between the twentieth and twenty-first centuries, the years 1999 and 2000, and leap-year calculations). NEI/NUSMG issued the framework document NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness" to all licensees in November 1997. The document recommends methods for nuclear utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license. The scope of NEI/NUSMG 97-07 covers software, or software-based systems or interfaces, whose failure (due to the Y2K problem) would (1) prevent the performance of the safety function of a structure, system or component and (2) degrade, impair, or prevent operability of the nuclear facility.

Discussion

Diverse concerns are associated with the potential impact of the Y2K problem on nuclear power plants because of the variety and types of computer systems in use. Some of the concerns are the (1) scheduling of maintenance and technical specification surveillance requirements, (2) use and application of programmable logic controllers and other commercial off-the-shelf software and hardware, (3) operation of process control systems, (4) performance of engineering calculations, and (5) collection of operating and post-accident plant parameter data.

Some vendors have taken such actions as placing information on the Internet discussing which of their products are Y2K compliant, and how the vendor is addressing the Y2K problem with respect to specific products, including products purchased by their nuclear power plant customers. When addressing some of the particular issues associated with the use and application of software, it has been found that even if the application has no apparent date manipulation algorithms, it may still be affected by a Y2K related problem. For example, a subroutine that date stamps the header information in archival tapes regardless of the rest of the content of the tape may be affected. In addition, although individually several systems may be "date safe," the integrated operations that the systems support may be vulnerable to the Y2K problem. Further, there are potential impacts from the operating system supporting their instrumentation system's application software and from sub-programs (such as calibration and data recording/reporting) associated with the main application software.

One application which is common to all power reactor licensees is the link between plant computers and the NRC's Emergency Response Data System (ERDS). This application performs the communication and data transmission function which provide near real-time data availability to NRC and state incident response personnel during declared emergencies. The NRC is currently performing Y2K related upgrades to ERDS which will maintain the same communication protocol as the current system with the exception that either 2-digit or 4-digit year fields will be accepted. Those licensees that anticipate changes to their ERDS link should allow time in their schedules for retesting their systems. NRC contractors will support requests for testing on a "first come, first served" basis.

NEI/NUSMG 97-07 suggests a strategy for developing and implementing a nuclear utility Y2K program. The strategy recognizes management, implementation, quality assurance, regulatory considerations, and documentation as the fundamental elements of a successful Y2K project. The document contains additional guidance for these fundamental elements. The recommended components for management planning are management awareness, sponsorship, project leadership, project objectives, project management team, management plan, project reports, interfaces, resources, oversight, and quality assurance. The suggested phases of implementation are awareness, initial assessment (which includes inventory, categorization, classification, prioritization, and analysis of initial assessment), detailed assessment (including vendor evaluation, utility-owned or -supported software evaluation, interface evaluation, remedial planning), remediation, Y2K testing and validation, and notification. The quality assurance (QA) measures apply to project management QA and implementation QA. Regulatory considerations include the performance of appropriate reviews, reporting requirements, and documentation. Documentation of Y2K program activities and results includes documentation requirements, project management documentation, vendor documentation, inventory lists, checklists for initial and detailed assessments, and record retention. NEI/NUSMG 97-07 also contains examples of various plans and checklists as appendices.

The staff believes that the guidance in NEI/NUSMG 97-07, when properly implemented, will present an appropriate approach for licensees to address the Y2K problem at nuclear power plant facilities.

In the course of implementing the Y2K readiness program, problems could be identified that potentially impact the licensing basis of the plants. In certain cases, license amendments may be needed to address the problem resolution. Licensees should submit such license amendments to the NRC on a timely basis. The utility Y2K readiness programs and schedules should have the flexibility to accommodate such an eventuality. In addition, licensees are reminded that any changes to their facilities that impact their current licensing basis must be reviewed in accordance with existing NRC requirements and the change properly documented.

Required Response

In order to gain the necessary assurance that addressees are effectively addressing the Y2K problem and are in compliance with the terms and conditions of their licenses and NRC regulations, the NRC staff requires that all addressees submit a written response to this generic letter as follows:

1. Within 90 days of the date of this generic letter, submit a written response indicating whether or not you have pursued and are continuing to pursue a Y2K readiness program as outlined in NEI/NUSMG 97-07. If you are not conforming to the NEI/NUSMG guidance, present a brief description of the program(s) that have already been completed, are being conducted, or are planned to ensure Y2K readiness of the computer systems at your facility(ies). This response should address the program's scope, assessment process, and plans for corrective actions (including testing, and schedules).
2. Upon completing your Y2K readiness program, or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready and in compliance with the terms and conditions of your license(s) and NRC regulations. In addition, the response should contain a status report of work remaining to be done to complete your Y2K program, including completion schedules. {"Y2K Ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system or application is not fully Y2K Compliant. "Y2K Compliant" is defined as computer systems or applications that accurately process date/time data (including but not limited to, calculating, comparing, and sequencing) from, into and between the twentieth and twenty-first centuries, the years 1999 and 2000, and leap-year calculations.}

Address the written reports to the U.S. Nuclear Regulatory Commission, Attention: Document Control Desk, Washington, D.C. 20555-0001, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act 1954, as amended, and 10 CFR 50.54(f). In addition, submit a copy to the appropriate regional administrator.

Backfit Discussion

This generic letter only requests information from addressees under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). The requested information will enable the staff to verify that each nuclear power plant licensee is implementing an effective plan to address the Y2K problem and provide for safe operation of the facility before January 1, 2000, and is in compliance with the terms and conditions of their license(s) and NRC regulations. The following NRC regulations are a basis for this request:

10 CFR 50.36, "Technical Specifications," paragraph (c)(3), "Surveillance requirements," and paragraph (c) (5), "Administrative controls." These relate, respectively, to requirements relating to test, calibration,

or inspection to assure that the necessary quality of systems and components is maintained, and to provisions relating to management, procedures, record keeping, and review and audit necessary to assure operation of the facility in a safe manner.

10 CFR 50.47, "Emergency plans," paragraph (b)(8), which relates to the provision and maintenance of adequate emergency facilities and equipment to support the emergency responses.

Appendix B to 10 CFR Part 50, Criterion III, "Design Control," requires that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Appendix B to 10 CFR Part 50, Criterion XVII, "Quality Assurance Records," requires that sufficient records shall be maintained to furnish evidence of activities affecting quality. The records are to include, among others, operating logs and results of reviews.

Appendix E to 10 CFR 50, Section VI, "Emergency Response Data System" which relates to the provision and maintenance of licensee links to the Emergency Response Data System.

In addition, the following requirements from Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants", also provide a basis for the request: (In the statement of consideration (SOC) for the amendment to 10 CFR Part 50 which added Appendix A, "General Design Criteria for Nuclear Power Plants," published in the Federal Register on February 20, 1971, the Commission noted that the general design criteria added as Appendix A to Part 50 establish the minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission. Principal design criteria established by an applicant and accepted by the Commission will be incorporated by reference in the construction permit. The SOC also notes that in considering the issuance of an operating license under Part 50, the Commission will require assurance that these criteria have been satisfied in the detailed design and construction of the facility and any changes in such criteria are justified. It should be noted that a proposed Appendix A to 10 CFR Part 50 was published in the Federal Register on July 11, 1967, and the comments and suggestions received in response to the notice of proposed rule making and subsequent developments in the technology and in the licensing process have been considered in developing the general design criteria.)

Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 13, "Instrumentation and control," which addresses the provision of appropriate instrumentation and controls to monitor and control systems and variables during normal operation, anticipated operational occurrences, and accident conditions as appropriate to ensure adequate safety.

Appendix A to 10 CFR Part 50, GDC 19, "Control room," which requires the provision of a control room from which actions can be taken to operate the nuclear plant safely.

Appendix A to 10 CFR Part 50, GDC 23, "Protection system failure modes," which requires that the protection system shall be designed to fail into a safe state or into a state demonstrated to be acceptable on some other defined basis.

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U. S. NUCLEAR REGULATORY COMMISSION

RESOLUTION OF PUBLIC COMMENTS ON PROPOSED DRAFT GENERIC LETTER ON YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS

This report discusses the resolution of comments received on the draft generic letter, GL No. 98-xxx: Year 2000 Readiness of Computer Systems at Nuclear Power Plants in response to the Notice of Opportunity for Public Comment in the Federal Register, January 29, 1998. The comments and corresponding staff response are provided below in the order the comments were received.

1. **John Roberts**

   Comment:

   > Why not set up a process to check the Year 2000 (Y2K) problem by advancing computer clocks in the form of a surveillance test during the next refueling outage?

   Resolution:

   > No changes to the GL are needed since as part of a utility specific program addressing the Y2K problem, the NRC staff notes the assessment stage involves such testing activities to identify the effects of the Y2K problem on plant systems.

2. **Snyder Gokey**

   Comment:

   > The blanket assertion made by the utilities... that Y2K "was not a problem" in safety related systems" is almost assuredly wrong. After the utilities do the work, if they find it to be true, they can make the statement.

   Resolution:

   > No changes to the GL are needed since the statement in the GL is: "To date, the NRC staff has not identified or received notification from licensees or vendors of digital protection systems ... that a Y2K problem exists with safety-related initiation and actuation systems." Moreover, as part of the Y2K readiness program that utilities are undertaking, review of safety-related systems for Y2K concerns would be assigned a top priority at the assessment stage.

3. **Virgil C. Summer Nuclear Station**

   Comments:

   a. The nuclear industry has already begun extensive preparations for addressing the Y2K problem; further oversight would be an unnecessary burden, not commensurate with the safety significance of this issue.
   b. The NRC in issuing the GL is effectively reducing the time allowed for utilities to become Y2K ready by 6 months. The financial impact to some licensees, forced to plan an additional outage for remediation of components not accessible during power operation, is not justified by the safety significance of the issue. The procurement process for some replacement components ... may prohibit some licensees from achieving Y2K readiness within the reduced time frame.

c. In light of the industry guidance provided by NEI, the limited replacement and qualified personnel available, it is recommended that the proposed GL not be issued.

Resolution:

The generic letter acknowledges that many utilities have already embarked upon a program to address the Y2K computer system problem. In preparing the GL, the staff assumed that all utilities are aware of the problem based on issuance of IN 96-70 dated December 1996, and have programs in place to address the problem. The response required by the GL is confirmatory in nature to assure that all licensees of operating nuclear power plants are effectively addressing the Y2K problem.

The NRC staff does not plan to change the July 1, 1999 date for certification of Y2K readiness. However, sufficient flexibility has been provided in the final GL to accommodate completion of some remediation and implementation activities at normally scheduled outages after July 1, 1999. It is the NRC staff's belief that unless the majority of the Y2K program remediation, validation and implementation activities are completed by mid-1999, leaving only a few such activities scheduled for the Fall 1999 outage, the facility will not in all probability be Y2K ready by January 1, 2000. The GL will be revised to indicate that actual Y2K readiness after July 1, 1999 is acceptable, however, certification that the facility will be Y2K ready will be required by July 1, 1999. The NRC staff recognizes that Y2K readiness may include compensatory measures and contingency plans in cases where actual Y2K compliance for some computer systems cannot be achieved.

4. **John Roberts**

Comment:

Comment regarding identifying and testing time clocks built into plant process computers. Comment is in a similar vein as Comment No. 1.

Resolution:

See response to Comment No. 1.

5. **BWX Technologies, Inc**

Comment:

The GL identifies "Framatome/Babcock & Wilcox" as a vendor - there is no "Framatome/Babcock and Wilcox" organization.

Resolution:

The erroneous name is deleted from the GL.

6. **TU Electric/Comanche Peak Steam Electric Station**

Comments:

a. The nuclear industry has begun extensive preparations for the Y2K per the guidelines of NEI/NUSMG 97-07. NRC had already issued IN 96-70 on the subject of the Y2K problem. These and the provisions of existing reporting requirements under 10 CFR Part 21, 10 CFR 50.72 and 10 CFR 50.73 make the proposed GL unnecessary. Similar reasons apply to the requirement for certification in the GL.

b. The July 1, 1999 date may not be a real date for Y2K readiness. Comanche Peak Nuclear Station has two outages planned in 1999 - Unit 1 in Spring 99 and Unit 2 in

Fall 99. As part of our Y2K program, we are currently performing assessments on all digital technology based equipment to ensure that if problems are not fixed, contingency plans are in place by December 15, 1999, to address continued safe operation/availability of the affected systems, components and structures in accordance with rules and regulations governing our licenses.

c. In light of all this and since the nuclear utility group is addressing the issue, it is recommended that the proposed GL not be issued.

Resolution:

See Comment No. 3 and associated resolution.

7. Richard Cowles

Comments:

The main comment was that the draft GL should be issued substantially in its present form and provided several reasons for the main comment. He emphasized "Continued safe operation of all nuclear facilities dictates the need for 100% completion of Y2K readiness programs, and executive level accountability for this readiness through the oath and affirmation process." Since time is of the essence, the NRC is urged to issue the GL as expeditiously as possible.

Resolution:

As suggested, the GL will be issued substantially in its present form.

8. OMB Memorandum dated January 20, 1998.

Comment:

The OMB memorandum established a new target date of March 1999 for implementing fixes to all systems government-wide.

Resolution:

The NRC staff believes that for nuclear power plant facilities which generally follow spring and fall refueling outages during which period the licensee implements many aspects of their Y2K program, the target date of July 1, 1999, is appropriate rather than March 1999.

9. Consumers Energy - Palisades and Big Rock Point Nuclear Plants

Comments:

a. Consumers Energy is willing to participate in a voluntary submission of project and schedule information to the NRC via NEI or individually. Consumers Energy does not believe that a GL is warranted. Because of the potential impact on safe plant operation and the potential financial impact, significant resources have been and will continue to be dedicated to resolve the Y2K computer issue prior to the end of 1999 whether or not a formal requirement exists in the form of a generic letter.

b. In the event a voluntary submittal is unacceptable to the NRC, we request that the date for attesting to Year 2000 readiness be changed from July 1, 1999 to October 1, 1999, to allow adequate time to accomplish the required actions.

Resolution:

In the Notice of Opportunity for Public Comment that was published in the *Federal Register*: January 29, 1998 (Volume 63, Number 19) with the proposed GL on Year 2000

Readiness of Computer Systems at Nuclear Power Plants, the NRC encouraged the industry to propose a viable alternative to the GL as a means of providing the necessary assurance to the NRC staff that all licenses are effectively addressing the Y2K problem in computer systems at their facilities. To date, Consumers Energy has been the only volunteer willing to provide the necessary information for two facilities. This does not constitute an industry wide response. No industry group (like NEI) has volunteered. Therefore, the GL will be issued.

As regards changing the date for Y2K readiness certification from July 1, 1999 to October 1, 1999, the date will remain July 1, 1999. However, as stated in the resolution to Comment No. 3 above, some flexibility has been provided in the GL to accommodate completion of certain activities in the Y2K readiness program after July 1, 1999.

10. **Roleigh Martin, M.A.**

Comment:

Basically, Mr. Martin endorsed the comments submitted by Rick Cowles (Comment No. 7 above) and provided some supporting information for his endorsement.

Resolution:

See resolution of Comment No. 7 above.

11. **Entergy Operations, Inc.**

Comments:

a. Entergy believes the proposed GL is unnecessary because utilities are aware of the Y2K problem and recognize the need to take steps to address the issue. Additionally, licensees have a responsibility as well as an obligation to operate their plants per their licensing and design bases.
b. Comments on Required Response (2):
    1. Entergy believes the July 1, 1999 due date is unreasonable based on the volume of work to be performed. This requirement effectively reduces the time allowed licensees to become Y2K ready by 6 months. A more reasonable date would be November 1, 1999.
    2. The draft GL definition of "Y2K Ready" is applicable to a single computer system or application. By applying "Y2K Ready" to the facility, it appears that NRC is expecting every computer system or application to be "Y2K Ready." This may not be the case since the licensee may take compensatory actions in lieu of ensuring a computer system or application is "Y2K Ready." Required Response (2) should explicitly acknowledge that taking compensatory actions is acceptable if the licensee determines such actions are necessary to ensure continued, safe plant operation.

Resolution:

See resolution of Comment No. 3 above.

12. **Omaha Public Power District (OPPD)**

Comments:

a. OPPD would prefer to participate in a voluntary initiative coordinated by NEI and

NUSMG.

b. Recognizing that the NRC may decide to issue a GL, OPPD provided a revised version of the proposed GL. The revised GL by OPPD had several editorial comments. The Required Response (2) in the GL was modified to delete the phrase "and in compliance with the terms and conditions of your license(s) and NRC regulations. The Required Response was reworded to read "No later than July 1, 1999, submit a written response confirming that your facility is Y2K ready, or if your program is incomplete as of that date, indicate your schedule for attaining the status of Y2K Ready."

Resolution:

Neither NEI nor NUSMG has volunteered to coordinate utility responses, therefore, the GL will be issued.

The editorial comments are addressed in the final version of the GL. As stated in response to Comment No. 3, the final GL allows certain flexibility to accommodate plant specific schedules for completion of some Y2K readiness program activities. The date for Required Response (2) will remain July 1, 1999.

13. GPU Nuclear

Comments:

a. Throughout the proposed GL the phrase used repeatedly is that licensees must provide "... written certification that their facilities are Y2K ready and (underline added) in compliance with the terms and conditions of their licenses and NRC regulations." This phrase should be modified to say: "... written certification that their facilities are Y2K ready with regard to compliance with the terms and conditions of their licenses and NRC regulations." The blanket statement that the facilities must be Y2K ready implies that every component at the facilities regardless of its safety implication need to be certified. We do not believe that this is the intent of the subject proposed generic communication.

b. The requirement of a written response, in which licensees must certify their facilities, by no later than July 1, 1999 is arbitrary. While it is clearly a licensee responsibility to assure that their facilities are Y2K ready, certain conditions such as plant outage schedule and/or resource limitation may not allow readiness certification by July 1, 1999. Outages for some plants are scheduled to commence in the third or fourth quarter of 1999. It is expected that certain testing and/or modifications can only be performed during a plant outage.

c. GPU Nuclear intends to follow the NEI/NUSMG guidance. However, it is our understanding that the plans and checklists provided in the appendices are for illustrative purpose and may be modified ad/or improved to meet our specific needs and/or requirements. We suggest the following changes to the last sentence of the fifth paragraph under "Discussion."

> "NEI/NUSMG 97-07 also contain examples of various plans and checklists as appendices, which may be used or modified to meet licensee's specific needs and/or requirements."

Resolution:

The NRC staff agrees with comments a. and c. above, and the final GL has been revised to reflect this. As regards the comment b. above, see the response to Comment No. 3.

14. TVA

Comment:

TVA believes that utilities cannot categorically state that they will not experience a Y2K problem. TVA agrees that every reasonable effort should be made to identify and correct Y2K problem. However, there may be some software, especially in embedded systems, which cannot be tested or certified for compliance. Therefore, the GL should recognize contingency planning as acceptable remediation for some Y2K problems.

Resolution:

The NRC staff agrees with the comment. The final GL will include a discussion on the need for contingency planning.

15. Southern California Edison

Comments:

a. The Required Response paragraph 2 requires a response confirming that the facility is Y2K ready and in compliance with the Technical Specifications. Clarification is required stating that this applies only to the scope of NEI/NUSMG 97-07.... We believe remediation should only be required for equipment that directly involves reactor safety or technical specification compliance equipment. All other identified equipment should be evaluated on an impact and cost effective remediation option basis.

b. We believe it may not be possible to identify every digital component or line of code that will be affected. Therefore, we believe the required readiness response at the completion of the project, or by the 7/1/99 due date, needs to be clarified to mean that utilities have followed a methodology endorsed by the NRC and that utilities have exercised due diligence in accordance with their plan. Furthermore, clarification should be added that "Y2K Ready" may include the development and/or implementation of appropriate contingency plans to address items that are not expected to be remedied prior to January 1, 2000, and/or to address the possibility of unidentified items and their effect on plant operation.

Resolution:

The required responses of the GL are simply seeking confirmation of activities the licensees are already performing in addressing the Y2K problem at their facilities in accordance with a plant specific program. The scoping and related licensee activities are being conducted according to that program. The staff's understanding is that these plant specific programs are based on a framework such as the one outlined in NEI/NUSMG 97-07.

The NRC staff agrees with the comment that it may not be possible to identify every digital component or software that will be affected and that, therefore, continency plans should be considered. The revised GL discusses contingency plans as a viable temporary alternate, till the program is completed as planned. See response to Comment 3 above.

16. Florida Power & Light Company

Comments:

a. The Nuclear Energy Institute (NEI) is providing comments on the proposed GL on behalf of the industry. FPL endorses the NEI comments. (NEI comments are indicated here as Comment No. 17.)

b. FPL has some specific concerns should the NRC elect to issue the GL. Specifically, the scope of the letter is not clearly defined. Emphasis should be limited to systems and related computer equipment that would prevent the performance of a safety-related structure, system, or component, and not for the whole of plant facilities. These specific safety systems and related computer equipment should be identified and evaluated by each individual facility. Additionally, it may be appropriate for vendors of digital systems to take a larger role in identifying and notifying the NRC staff of deficiencies, non-conformance and failures, and other concerns related to the Y2K issue.

Resolution:

For the response to NEI comments, see Comment No. 17 below. As stated earlier, the GL is simply requesting confirmation of activities already ongoing at nuclear plant facilities in accordance with plant specific Y2K readiness programs. The scope, priorities and emphasis on identification and evaluation of systems, structures and components are determined as part of the initial assessment activities of that program.

The NRC staff agrees with the comment that vendors of digital systems provide feedback to NRC staff of Y2K problem related failures and deficiencies. The NRC staff would disseminate such generic and significant data to licensees via NRC generic communications. Vendors are obligated to report nonconformances in safety-related systems in accordance with the requirements of 10 CFR Part 21.

17. Nuclear Energy Institute (NEI)

Comments:

a. NEI believes that the proposed generic letter will do little to improve nuclear safety. Licensees have programs that place priority on safety systems as well as ensuring continuity of operations needed to produce electric power through the turn of the century. This comment is based on the following reasons:

The NRC staff as been involved, over the last year, in many industrial activities that prepare for the turn of the century. Continuing these interactions will be more meaningful in understanding industry progress on Year 2000 readiness over the next year than the proposed reports. NEI believes that a continued dialog between the industry and the staff is the best alternative to the proposed generic letter.

The NRC staff concluded that safety systems would function as intended in SECY 97-213 of September 24, 1997. Even with Year 2000 failures, the SECY stated that operators would be able to maintain safe plant shutdown conditions. Industry testing continues to support these conclusion... Current reporting criteria were also considered adequate for any problems identified.

The nuclear industry is well into a program that will reduce the risk of plant

shutdown due from computer system failures at the turn of the century. This program, as described in NEI/NUSMG 97-07, evaluates potential risks to the entire plant, not just the nuclear systems.

An NEI survey of nuclear utility industry shows progress on licensee Year 2000 programs. For operational plants, all licensees have a Year 2000 program; all programs are, or will be, consistent with the guidance of NEI/NUSMG 97-07; and on average the initial inventory is 67% complete for software and 50% complete for embedded systems.

Over the last year, the industry has worked to share experience gained by individual plants. Workshops and training sessions have also been conducted over the last year, with broad industry attendance.

b. NEI also expressed the following specific concerns:

Many licensees have objected to providing certification under 10 CFR 50.54(f) requirements for site program that extends well beyond the nuclear systems important to safety or meeting regulatory commitments.

Some licensees feel that achieving Year 2000 readiness by July 1, 1999, creates an undue burden. Some facilities have already planned specific remediation to be completed in outages after that date. Other programs had established program readiness targets of September 1999. Accelerating these programs, with the added expense, is unwarranted.

Resolution:

The NRC staff has participated in many of the industry meetings and workshops related to the Y2K problem. The impression the NRC staff has is that although all nuclear plant licensees are aware of the problem and its implications and many may have initiated a readiness program, the level of effort and progress towards resolution varies substantially. The purpose of the generic letter is to gain the necessary assurance that all licensees are effectively addressing the Y2K problem with regard to compliance with the terms and conditions of their licenses and NRC regulations.

As regards the specific comments, the Required Response (2) has been modified to clarify that the certification of Y2K readiness apply only to those systems required to meet the terms and conditions of the facility license and NRC regulations. Further, allowance has been provided for those facilities whose Y2K program is incomplete as of July 1, 1999. See response to Comment 3 above.

18. Winston & Strawn (on behalf of the Nuclear Utility Backfitting and Reform Group (NUBARG))

Comments:

a. Clarification is needed to ensure that the proposed generic letter does not create a new reporting obligation for problems related to Y2K problem. While the Y2K problem can result in failures that may be reportable under 10 CFR part 21, or 10 CFR 50.72 or 10 CFR 50.73, the Y2K problem in and of itself is not a *per se* reportable event absent a failure or other event resulting from the Y2K problem. NUBARG recommend that the GL state clearly that some Y2K problems could be reportable

under existing reporting requirements.

b. The licensee's obligations in the proposed Generic Letter are not clearly focused on the obligation for being Y2K ready versus Y2K compliant.

c. The Generic Letter invokes "compliance exception" to the back fitting rule without any substantive analysis of the backfitting implications of this proposed Generic Letter.

Resolution:

a. The NRC staff agrees with the first point above. A Y2K problem in a safety-related system by itself may not be a event, unless it results in a deficiency, non-conformance or failure that is required to be reported under the regulations cited. The GL has been revised to clarify that only some of the deficiencies, non-conformance and failures resulting from the Y2K problem in safety-related systems are reportable under 10 CFR Part 21, 10 CFR 50.72 and 10 CFR 50.73.

b. The generic letter is only requesting confirmation and information on the status of ongoing licensee programs that address the Y2K problem at their facilities. The program objectives of which system or application is to be Y2K compliant, and which is to be retired, replaced or modified, is part of the ongoing program and the responsibility of the licensee. See response to Comment 3 above.

c. The generic letter is requiring actions by licensees to confirm the facility is in compliance with the terms and conditions of its license and NRC regulations given the recognized Y2K problem in computer systems. This is, therefore, a compliance issue and not a backfit.

19. Southern Nuclear Operating Company

Comment:

Southern Nuclear Operating Company is in total agreement with NEI comments.

Resolution:

NEI comments and their resolution are provided in Comment No.17 above.

20. JoAnne Hodgkins

Comment:

Power is essential, are you ready?

Resolution:

This comment is assumed to endorse the proposed generic letter.

21. Carolina Power & Light Company

Comments:

a. "Required Response" Section, paragraph 1

> The NRC states: "within 90 days... submit a written response indicating whether or not you have pursued ...a Y2K readiness program as outlined in NEI/NUSMG 97-07. If you are not conforming...."

Comment: NEI/NUSMG 97-07 recommends methods for Y2K program setup and examples of forms and checklists used by some utilities. The word "conforming"

implies that the methods, forms and checklists are used verbatim. CP&L suggests the wording be changed to "....submit a written response .... a Y2K readiness program *similar to that* outlined in NEI/NUSMG 97-07. *If your program significantly differs from* the NEI/NUSMG guidance..."

b. "Required Response" Section, paragraph 2

> The NRC states: "Upon completing your Y2K readiness program, or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready and in compliance with the terms.....In addition, the response should contain a status report of work remaining to e done to complete your Y2K program, including completion schedules."

Comment: Due to outage schedules and other priorities related to the Y2K issue, some work will not be completed prior to July 1, 1999. Clarify this requirement to state, "No later than July 1, 1999, submit a written response containing a status report, including completion schedules, of work remaining to be done to confirm your facility is/will be Y2K ready."

Resolution:

a. The NRC staff agrees with this comment. Required Response (1) is revised as suggested by CP&L. Additionally, the "Discussion" section of the generic letter has been changed to emphasize that NEI/NUSMG 97-07 is only a guidance document which provides an example of an appropriate Y2K program, and that plant specific Y2K programs are needed to effectively address the Y2K problem.

b. The NRC staff agrees with this comment. Required Response (2) has been revised to consider actions by licensees who may not have completed the facility Y2K program by July 1, 1999 due to work scheduled during plant outages in the third and fourth quarter of 1999. See response to Comment 3, above.

22. U.S. General Accounting Office (GAO)

Comments:

GAO comments are directed at clarifying and strengthening NRC's regulatory authority to address safety-related Year 2000 problems, particularly in these areas:

- Specifying a more complete Year 2000 program for licensees
- Monitoring licensees' progress on Year 2000 readiness
- Clarifying the "Year 2000 ready" certification
- Addressing future Year 2000 maintenance requirements

Specifying a more complete Year 2000 program for licensees

The proposed generic letter would require licensees to indicate whether they are pursuing a Year 2000 readiness program at their facilities. As a benchmark of program effectiveness, NRC is relying heavily on Year 2000 guidance developed jointly by NEI and NUSMG, NEI/NUSMG 97-07. We agree on the importance of requiring licensees to provide NRC with assurance that they are implementing a program that effectively addresses the Year 2000 issue. However, we believe that NRC should be aware that the NEI/NUSMG document has several significant shortcomings. The NEI/NUSMG guidance does not

include all the elements of a comprehensive Year 2000 program. In particular the guidance does not deal adequately with risk management, business continuity and contingency planning, or remediation of embedded systems.

Section C of the NEI/NUSMG guidance specifies that vendors should provide Year 2000 compliance warranties to licensees, even for work previously completed. NRC appears to endorse contract language included in the NEI/NUSMG document. We suggest that NRC reconsider any apparent endorsement of contract language for use by private parties.

As an alternative to relying on the NEI/NUSMG guidance, we suggest that NRC's generic letter specify the elements of an effective Year 2000 program, particularly as they bear on safety concerns under NRC's regulatory authority. One publication that can help NRC in this regard is our Year 2000 Computing Crisis: An Assessment Guide (GAO/AIMD-10.1.14, September 1997). This guide is a distillation of government and private sector best practices for dealing with the Year 2000 problem, and provides a useful overview of the elements of an effective Year 2000 program.

NRC could require licensees to address the elements of an effective Year 2000 program when they submit the "brief description" of their own program, as called for in the proposed generic letter. This approach would provide NRC with a better basis for assessing the effectiveness of the licensees' Year 2000 program dealing with safety-related issues.

Monitoring the progress of licensees' Year 2000 programs

The proposed generic letter requires the licensees to make only two reports on their Year 2000 programs. To effectively monitor licensees' Year 2000 progress on systems under its regulatory authority, NRC will need more substantive and frequent progress reports. These reports should, at a minimum, require (1) a complete inventory of safety systems and other systems that will need to be certified as "Year 2000 ready" under the generic letter, (2) planned actions on these systems, including formulation and testing of contingency plans, and (3) periodic updates on the status of these actions. Waiting until July 1999 will not leave NRC much time to respond constructively to a licensee's unresolved Year 2000 problems.

Certifying "Year 2000 Readiness" for Safety Systems

NRC's proposed generic letter requires each licensee to provide written response confirming that "your facility is Y2K ready and in compliance with the terms and conditions of your license(s) and NRC regulations." While the criteria for "Year 2000 compliance" are clear and amenable to objective testing, the same cannot be said for the term "Year 2000 ready." The determination of being "Year 2000 ready" does not require the licensees to state how and why they determined that a non-compliant system would be suitable for continued use. For those critical safety systems under NRC's purview, we suggest that the generic letter include such a requirement. It would also be useful if the generic letter included a discussion of how NRC's ongoing inspection activities will be used in the process of certifying Year 2000 readiness. For example, it is not clear whether the inspections will include checks to see if key Year 2000 issues are being addressed, whether key conversion activities are being carried out properly, or whether critical project milestones are being met.

Independently verifying and validating safety systems

The generic letter does not discuss the role of independent verification and validation (IV&V) in supporting the licensees' "Year 2000 ready" certifications. We recognize that, under NRC regulations, modifications to certain systems at nuclear facilities must be verified or checked to ensure that the systems will continue to operate properly. However, the unusual challenges posed by the Year 2000 problem may warrant additional assurances.... Accordingly, we suggest that the generic letter require licensees to (1) describe their Year 2000 plans for IV&V of systems related to safety and (2) provide the results of IV&V with their written certification of Year 2000 readiness.

Addressing future maintenance requirements of "Year 2000 ready" systems

NRC's proposed generic letter requires only that computer systems and applications be "Year 2000 ready." However, there may be future maintenance requirements for "Year 2000 ready" systems under NRC's purview. NRC's generic letter does not include a way to identify, track, and follow up on the future maintenance plans for any safety-related "Year 2000 ready" systems that could eventually fail without further modification or replacement. Therefore, we suggest that the letter address the issue of future Year 2000 maintenance requirements.

Resolution:

Specifying a more complete Year 2000 program for licensees

The NRC staff agrees with this comment. The GL has been revised to note that the NEI/NUSMG guidance document provides a framework and an example of a Y2K program, only and that the Y2K program for each nuclear facility must be tailored to meet the specific needs and requirements of the facility. The GL was further revised to note that augmented guidance beyond that in NEI/NUSMG 97-07 may be needed by licensees in the area of risk management, business continuity and contingency planning, and remediation of embedded systems. The GL has been revised to point out that NEI/NUSMG 97-07 contains examples of various plans and checklists as appendices, which may be used or modified to meet a licensee's specific needs and/or requirements.

The GL was also revised to identify the general elements of a Y2K program and to refer to GAO/AIMD-10.1.14, September 1997, as another document that provides useful overview of the elements of an effective Year 2000 program.

Monitoring the progress of licensees' Year 2000 programs

The NRC staff has identified an alternative means to periodic reports for monitoring licensee progress on the Y2K problem. Monitoring of the progress of implementation of nuclear facility Y2K programs will be done by the NRC staff via sample onsite reviews at nuclear facilities. The onsite reviews are planned to be done during the latter half of 1998 and into 1999. The generic letter will not be modified to include the need for frequent progress reports.

Certifying "Year 2000 Readiness" for Safety Systems

The NRC staff agrees with this comment. The GL has been modified to clarify that "readiness" and completion of a Y2K program means the attainment of the Y2K program

objectives which would be defined as part of the program during the assessment and remediation planning stages. The evaluation performed at these stages as part of the program, would document the bases of the decisions made regarding the use of compliant and non compliant systems. The review of such documents would be part of the NRC staff's sample onsite review of a nuclear facility's Y2K program implementation. Also refer to the response to Comment 3, above.

Independently verifying and validating (IV&V) safety systems

The NRC staff agrees with the need for IV&V in certain circumstances regarding the Y2K problem. The NRC staff's sample onsite follow up review of licensee's Y2K program activities, provides, in a sense, an "independent" review of the overall Y2K program implementation. It should be noted that IV&V of specific safety system software is an activity required as part of compliance with existing NRC guidelines. This applies to safety-related software modifications needed to address Y2K problems. The NRC staff follow-up reviews will confirm that IV&V of safety system software has been conducted where necessary after completion of Y2K changes

Addressing future maintenance requirements of "Year 2000 ready" systems

The NRC staff agrees with this comment. The GL has been modified to address the need to consider future maintenance activities as part of completing the Y2K program.

23. Northeast Nuclear Energy/Millstone Nuclear Power Station

Comments:

a. The "Purpose" section statement that requires ".. written certification that the facilities are Y2K ready and in compliance with the terms and condition of their licenses and NRC regulations" should be removed or clarified to restrict the written certification of compliance to electronic digital computational systems or devices with time and date attributes that may impact the performance of safety-related structures, systems and components (SSCs).

b. The first sentence of the third paragraph within the "Description of Circumstances" regarding applicability of 10 CFR 21, 10 CFR 50.72, and 10 CFR 50.73 report ability criteria to the Y2K problem raises significant regulatory enforcement issues. The NRC staff should provide the commercial nuclear power industry guidance as to the reportability of Y2K issues to provide both a predictable regulatory environment and consistency in utility reporting in this matter.

c. The statement in the last paragraph in the "Description of Circumstances" regarding how NEI/NUSMG 97-07...." ensures that [nuclear licensee's] facilities remain safe and continue to operate within the requirements of the license" is not accurate with respect to the purpose of the NEI/NUSMG document and should be removed....

d. The first sentence within item 2 of the "Required Response" section again speaks to the written certification....See comment a. above.

e. The second sentence within item 2 of the "Required Response" section regarding the inclusion of "...a status of work remaining to be done..." should be removed. This statement is redundant to the first sentence of item 2.

f. The proposed generic letter should reference and address the Executive Order issued on the Year 2000 Conversion problem by President Clinton on February 4, 1998. It is suggested that information regarding how this order impacts the implementation of the NRC's oversight of the commercial nuclear power industry be included in the proposed generic letter.

Resolution:

a. The NRC staff agrees with this comment. The particular sentence in the "Purpose" section and in the "Required Response" Item 2 has been revised to limit the scope of certification to systems, software and applications necessary to satisfy license conditions, technical specifications, and NRC regulations.

b. The NRC staff does not agree with this comment. Matters surrounding the Y2K problem are not specifically mentioned in the existing reporting requirements nor are any number of other specific reasons that may result in conditions that would lead to deficiencies, non-conformance, failures, and events that are deemed reportable under the existing reporting requirements. Licensees are to determine reportability based on the nonconformance identified.

c. The statement is extracted directly from the "Purpose and Scope" section of NEI/NUSMG 97-07. It will, therefore, not be deleted from the GL.

d. See Response a. above.

e. The NRC staff agrees, and the particular sentence is deleted in the final GL.

f. The NRC staff does not agree that the GL should reference the Executive Order on the Year 2000 Conversion. NRC oversight of nuclear facilities is indicated in other authorizing law. Nevertheless, it is noted that in referencing NEI/NUSMG 97-07 in the GL as an example of a possible approach for licensees when addressing the Y2K problem at their facilities, the staff is consistent with the policy of the executive order which encourages joint government/private sector cooperation on the Y2K problem. Further, in responding to the GL a licensee simply confirms the existence of an ongoing Year 2000 program and that the facility will be in compliance with its license and NRC regulations consistent with the NRC oversight responsibility.

24. PECO Nuclear

Comments:

a. The implementation period specified in the proposed GL (i.e., July 1, 1999) has effectively reduced the time allowed for utilities to become Y2K ready by 6 months. Therefore, PECO Energy recommends that if the proposed GL is issued, that the second paragraph (i.e., item 2) section be revised....(PECO comment included some suggested changes.)

b. PECO Energy is requesting clarification with regard to the following statement in Item 1 of the "Required Response" section:

> "...This response should address the program's scope, assessment process, and plans for corrective actions....."

It is unclear if this statement pertains to those licensees that are pursuing a Y2K readiness program as outlined in NEI/NUSMG 97-07 guidance or those licensees that

are not ....

Resolution:

The GL has been modified to reflect these comments. See also the response to Comment 3 above.

25. Northern States Power Company (NSP)

Comment:

NSP concurs with the NEI comments (Comment No. 17 above).

Resolution:

See the response to Comment No. 17 above.

26. Arizona Public Service Company (APS)

Comments:

a. The reference to Year 2000 "readiness" and "compliance" throughout the proposed letter should be changed, as appropriate, to use the terminology that is evolving into the industry standard. APS provided the definitions for these terms.

b. The sixth paragraph of"Descriptions of Circumstances" states that "NEI was preparing a framework document with guidance for utility use ....." This sentence should be modified to read: "NEI presented a framework document that provides guidance for utilities to use ....."

c. The sixth paragraph also states "The document recommends methods for nuclear utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license." While the NEI/NUSMG document provides guidance to utilities for addressing the Y2K problem, it does NOT ensure or imply that plants will remain "safe and continue to operate within the requirements of their license." Therefore, this statement should be modified....

d. Paragraph one of "Discussion", specifically item four, could be interpreted to mean that all codes in use today that have a date function should be evaluated to determine if any past or current output from these codes have been affected by the Y2K problem.... Although APS does not believe that this is the intent of this paragraph, further discussion should be provided to define what actions may be required to address the concern of this paragraph...

e. The sixth paragraph of "Discussion" should be modified to read as follows: "The staff believes that the guidance in NEI/NUSMG 97-07, when properly implemented, is an acceptable approach ....." It should be noted that this guidance provides a framework only and must be modified to address the embedded systems, design features, policies and procedures, at a minimum, that are unique to each facility.

f. Required Response 1 implies that the guidance provided in NEI/NUSMG 97-07 has been endorsed by the NRC and that other Y2K programs would require further evaluation by NRC. As described above, the NEI/NUSMG guidance provides a framework only and must be modified ... It should be made clear in the GL that such an adaptation of NEI/NUSMG guidance would meet NRC expectations.

g. Required Response 1 could be interpreted to mean that a description of a facility's

complete Y2K program should be provided to the NRC, including those applications and equipment that may not affect the operation of the facility,... Therefore, Required Response 1 should be modified to provide clarification that the required response only applies to safety-related systems and systems that are essential for power operations of the facility.

h. Required Response 2 is confusing in that it is not clear as to what information should be provided by July 1, 1999....

The words "... in compliance with the terms and conditions of your license(s) and NRC regulations" do not add any benefit to this required response.

The definitions of Y2K Ready and Y2K Compliant should also be removed from the required response.

Resolution:

a. The definitions of the terms "readiness" and "compliance" in the draft GL are extracted from NEI/NUSMG 97-07 and will be retained in the final GL.
b. The suggested changes have been made to the final GL.
c. The statement is extracted from the "Purpose" section of NEI/NUSMG 97-07 and will, therefore, not be changed in the GL.
d. Paragraph one of the "Discussion" in the GL has been revised to focus on the concerns associated with the Y2K problem and not their detailed implications. Those are part of the plant specific program's assessment activities which are to be addressed by the licensee.
e. The sixth paragraph of the "Discussion" in the GL has been modified per the comment.
f. Additional paragraphs are included under the "Discussion" in the GL to reflect the need for plant specific Y2K programs and recognize that NEI/NUSMG 97-07 provides an example of an acceptable Y2K program framework. Required Response 1 is also revised accordingly.
g. Required Response 1 simply confirms the existence of a facility specific Y2K program. If the program significantly differs from that which is outlined in NEI/NUSMG 97-07, a description of the program is required. As stated in the introductory paragraph of "Required Response," the intent of the requested responses is to assure that licensees are effectively addressing the Y2K problem with regard to compliance with the terms and conditions of the facility license and NRC regulations, i.e., the focus of the requirement is on systems, software and applications required to meet the facility license and NRC regulations. It is noted that most facilities have only a single Y2K program that addresses all affected systems in the facility. Thus, when providing a description of the Y2K program, the licensee may need to describe the activities beyond the scope of the concerns indicated in the GL.
h. Required Response 2 has been modified to address this comment.

27. North Atlantic/Seabrook Station

Comment:

North Atlantic believes that sufficient guidance for addressing the Y2K issue has been provided by NEI/NUSMG. We believe that as a result of the industry's efforts the proposed generic letter is unnecessary. The nuclear industry is already focused on this issue and further regulatory effort can be met through inspection versus placing additional burden on the licensee.

Resolution:

See response to Comment No. 17. Since the nuclear industry is already addressing the Y2K problem, the staff believes the burden imposed by the generic letter is minimal since a licensee's response simply confirms the existence of a Y2K program, and that the program will provide assurance that the facility is in compliance with its license and NRC regulations.

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U. S. NUCLEAR REGULATORY COMMISSION

SECY-97-213

September 24, 1997

FOR: The Commissioners
FROM: A. J. Galante,
Chief Information Officer
SUBJECT: YEAR 2000 COMPUTER ISSUE

PURPOSE:

To inform the Commission of the agency's efforts to manage the Year 2000 computer problem.

BACKGROUND:

The Year 2000 computer problem is a seemingly simple one: assuring that computers will recognize a correct date of January 1, 2000 and beyond. The problem results from computer hardware or software that uses two-digit fields to recognize the year. If the problem is not corrected, systems will fail to recognize the change in century and will misread "00" for the Year 2000 as 1900. If affected components are not altered to handle the date, there is a risk that these systems will fail to function properly.

The issue continues to receive a great deal of attention from the Congress, the press, and other interested groups. On April 29, 1996; January 14, 1997; March 26, 1997; and May 20, 1997; NRC received Congressional inquires on this subject. The Chief Information Officer (CIO) Council, formed as a result of the Clinger-Cohen Act of 1996 (formerly known as the Information Technology Management Reform Act of 1996), has discussed the Year 2000 issue at each of its monthly meetings since its formation in August 1996. Agency CIOs are providing leadership and direction to ensure that work is done to correct the Year 2000 problem within the Federal Government.

Unfortunately, the Year 2000 problem is not limited to the Federal Government. The issue affects State and local governments, firms from which NRC procures goods and services, the regulated industry, and the public. The potential effects of this issue are clearly global in nature.

DISCUSSION:

This problem has several unique characteristics that shape the agency's strategy for solving it. First, it has an unmovable deadline. Unlike other computer development or maintenance activities, the deadline for fixing the Year 2000 problem is not set administratively, but by the problem itself. Repairs must therefore be fully implemented and tested by December 31, 1999. This characteristic makes time the single most critical resource.

Second, unlike a normal system development or maintenance activity, many systems must be worked on concurrently. Comparisons and computations using dates permeate practically all computer systems within the Federal Government, State and local governments, and in the private sector. There is thus a real potential for substantial strain on another key resource- expertise.

Third, complexity is increased by concurrent changes to multiple systems and elements within a system (e.g., the operating system). Because computer systems inter-operate and share data, the modified

systems must be tested together. Furthermore, all of these changes must be made and tested while the current systems continue to operate.

The Year 2000 problem potentially affects the NRC in the following three areas of information systems development or use:

(1) systems developed by NRC staff or its contractors to support the agency's information system requirements
(2) commercial off-the-shelf hardware and software for minicomputer, microcomputer, and other agency applications (e.g., keycard access)
(3) hardware and software (including embedded microchips) used by the regulated industry

The strategy adopted by NRC follows industry best practices that have been broadly applied in the Federal Government *[Year 2000 Computing Crisis: An Assessment Guide*, General Accounting Office Report GAO/AIMD-10.1.14, February 1997]. These best practices include five phases:

- awareness - raising staff and industry awareness of the problem
- assessment - assessing the scope of the problem by creating an inventory of systems and deciding which ones to change, replace, or discard
- renovation - updating the systems that have a date problem
- validation - testing and validating the changed systems
- implementation - implementing the revised systems

The Office of Management and Budget, in consultation with the CIO Council, has set Government-wide milestones *[Getting Federal Computers Ready for 2000*, Office of Management and Budget report dated February 6, 1997] for completion of the majority of the work in the five phases. The phases, although sequential, overlap. For example, the awareness phase continues throughout the entire process. At NRC, the majority of the work under the assessment phase will be completed by September 30, 1997. Further details of the agency's program to resolve the Year 2000 issue internally can be found in Appendix A.

The agency is also addressing the Year 2000 computer problem as it relates to our licensees. With respect to operating reactors, staff discussions with vendors of digital protection systems have confirmed that safety-related initiation and actuation systems are not subject to the Year 2000 concern. This determination was based on the fact that computer-based, safety-related initiation and actuation systems do not rely on date-driven data bases in order to perform their required functions. However, non-safety-related, but important, computer-based systems may need modification for Year 2000 compliance. Further details on the Year 2000 issue and operating nuclear power plants can be found in Appendix B.

Fuel cycle and materials licensees have exhibited knowledge of the Year 2000 problem, but they have not informed NRC of any significant problems identified or corrected to date. Informal staff contact with some nuclear gauge manufacturers have indicated that there will be no Year 2000 problems. Manufacturers indicated that either the programming or microprocessors do not perform functions that

require a 4-digit date field or they already use 4-digit dates that will function correctly for dates beginning with the year 2000 and beyond. Although the results of these informal surveys are positive, there is a possibility that some other manufacturers may have a problem. For fuel cycle and materials licensees, the scope of the Year 2000 problem involves facility security, material control and accounting, and patient treatment concerns. Further details on these issues can be found in Appendix C.

RESOURCES:

NRC's current resource estimate to resolve the Year 2000 issue is 24.6 FTE and $7.2 million for contract support over the period FY-1996 through FY-2000. The total cost, $9.3 million (including salaries and benefits), has been reported to the Office of Management and Budget, and subsequently to Congress as part of the Federal Government's overall assessment of this issue. Both the uncertainties and the costs of resolving Year 2000 problems may rise as our involvement with other Federal agencies, States, contractors, vendors, and licensees increases.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Executive Director for Operations has reviewed this paper and concurs on its contents. Additionally, the Office of the Chief Financial Officer has reviewed this commission paper for resource implications and has no objections.

CONCLUSION:

The NRC is making progress in addressing the Year 2000 problem. We are well aware of the work that remains, and we are cognizant of the limited time and agency resources necessary to accomplish this work. Nevertheless, we are accelerating agency activities to address this challenge, and we are confident that the problem will be solved without disruption of agency programs.

A. J. Galante
Chief Information Officer

Contact: Arnold E. Levin, IRM
(301) 415-7458

Attachments: Appendix A: Year 2000 at the Nuclear Regulatory Commission
Appendix B: Year 2000 and Operating Nuclear Power Plants
Appendix C: Year 2000 and Fuel Cycle and Materials Licensees

cc: OGC
OCAA
OIG
OPA
OCA
ACRS
CIO
CFO
EDO
SECY

APPENDIX A

YEAR 2000 AT THE NUCLEAR REGULATORY COMMISSION

SCOPE OF THE YEAR 2000 PROBLEM AT NRC

The scope of the Year 2000 problem at the NRC includes (1) both hardware and software in the form of computer processors (mainframes, mini-computers and microcomputers, and scientific workstations), their peripheral devices (i.e., laser printers, automated scanners, etc.), and the application systems and commercial off-the-shelf (COTS) software that reside on them; (2) application software at NRC data services host systems for government-wide financial and cross-service systems; (3) telecommunications systems with embedded microchips; and (4) non-data processing systems with embedded microchips (e.g., elevators and access/security systems).

STATUS OF THE YEAR 2000 PROBLEM AT NRC

NRC's Year 2000 activities are aligned to conform to those outlined in the February 6, 1997, Office of Management and Budget (OMB) report entitled, "Getting Federal Computers Ready for 2000." On the basis of industry best practices, the report defines five phases with milestone completion dates to insure a successful Year 2000 Program:

Awareness	-	raising management and staff awareness of the problem	12/96
Assessment	-	determining the scope of the problem by inventorying systems and deciding which systems to change, replace, or discard	06/97
Renovation	-	making code changes to the systems to be changed	12/98
Validation	-	testing the changed systems	01/99
Implementation	-	placing changed systems into production	11/99

NRC reports on the status of these milestones to OMB under the Chairman's signature on a quarterly basis. Copies of these reports are also sent to the Subcommittee on Government Management, Information, and Technology, Committee on Government Reform and Oversight, U.S. House of Representatives.

NRC is very active in raising Awareness of the issues associated with the Year 2000 problem.

- On August 27, 1996, NRC issued an internal AUTOS Network Bulletin with interim guidance on what to look for in reviewing national laboratory, private contractor, and locally developed products for the potential impact of the century change and what IRM is doing for other applications and systems.

- On September 3, 1996, an article on the Year 2000 software problem was published in NRC's Weekly Announcements.

- NRC established an external Year 2000 World Wide Web site to provide links to GSA Year 2000 resource sites as well as to share information.

- NRC has issued an information notice to licensees informing them of the Year 2000 problem and suggesting that licensees may wish to consider what actions may be appropriate to examine and evaluate their software systems.

NRC is currently near the end of the Assessment phase of its program. During this phase, NRC initiated an agency-wide effort to create a complete inventory of all automated information systems and COTS software that the agency owns or shares with other agencies. We have also established and defined three categories into which all of our systems are being placed.

They are:

Mission-Critical: any system that has a high importance related to accomplishing the NRC mission and requires a high level of reliability because any delay in access to the system for any reason could adversely affect the ability of the agency to fulfill its mission of protecting public health and safety, promoting the common defense and security, and protecting the environment.

Business-essential: any system that is integral to agency processes that are required to meet agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while it was being repaired.

Non-critical: any system that is not mission-critical or business-essential and whose unavailability would, therefore, only represent an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired and manual processes can be readily used in their place if need be.

The following systems have been identified by NRC offices as mission-critical:

- Emergency Response Data System (ERDS/AEOD)
- Operation Center Information Management System (OCIMS/AEOD)
- Emergency Telecommunication System (ETS/AEOD)
- Sealed Source and Device Nationwide Registry (SSDR/NMSS)
- Licensing Tracking System (LTS/NMSS)
- General License Database (GLDB/NMSS)
- Agency computer systems network (AUTOS/IRM)

NRC is currently determining which systems will be classified as business-essential. These systems will have second priority with respect to renovation and validation efforts. Non-critical systems will have the lowest renovation and validation priority.

In assessing the agency's microcomputer hardware, it has been determined that NRC's basic 486 PC is not Year 2000 compliant. In FY 1996 NRC began to replace these PCs with Pentium-based PCs that are Year 2000 compliant. NRC plans to be using fewer than 275 486 PCS by mid-1999, and will install a software upgrade bringing them into Year 2000 compliance.

Additional information on the agency's large collection of COTS software is also being collected. IRM will be making a reference database of COTS software available to NRC staff that will indicate whether a particular package is Year 2000 compliant and, if it is, the compliant version number. This will assist

the staff in deciding if they need to upgrade their COTS software or discard it through the normal excess procedure.

The Renovation phase of NRC's program has begun with a focus on mission-critical systems. Several systems are currently being renovated and that work will steadily increase as we approach the scheduled date for completing the renovation phase. NRC's Validation and Implementation phases will be done concurrently with system renovation, and these phases are following our established milestones.

ISSUES CONSIDERED MOST SIGNIFICANT

The most significant Year 2000 issue is NRC's inability to precisely determine and document the status of systems that are outside agency control. This category includes systems services provided by other Government agencies and systems acquired from commercial sources. Most of the services are provided by major vendors such as AT&T, Bell Atlantic, Microsoft, and IBM. We are confident that these providers will correct any Year 2000 problems in such a manner as to prevent interruption of the business functions of their customers.

STRATEGY FOR DEALING WITH THE PROBLEM

NRC has created a Year 2000 Program to organize and resolve all issues associated with the Year 2000 problem. A Program Manager has been appointed who has overall responsibility for NRC's Year 2000 Program and reports directly to the NRC Chief Information Officer (CIO). The CIO reports to the Chairman of the Commission.

Although the Office of Information Resources Management (IRM) has the overall lead for the agency, all offices and regions must actively participate in addressing the Year 2000 effort. IRM is responsible for assessing and correcting the Year 2000 problem for software that it supports. IRM also is responsible for providing advice and consultation assistance to offices and regions in addressing computer systems for which those organizations have lead responsibility. To keep NRC staff up to date on this effort, IRM posts Year 2000-related news and links on the agency's World Wide Web Server, and maintains a list containing the names and e-mail addresses of individuals working on Year 2000 issues.

Internal accountability for performance of Year 2000 activities is being assured through continuous monitoring of all office activities against established milestones. A Year 2000 point of contact (POC) has been established for every office within the agency. POCs provide close coordination of their Year 2000 activities with the Year 2000 Program Manager. Beginning with October 1997, office directors will send progress reports to the Year 2000 Program Manager on a monthly basis. These reports will show the status of Year 2000 efforts in their office and will be used to update a central Year 2000 Inventory System database.

Offices and regions have lead responsibility for assessing and correcting the Year 2000 problem for computer systems that they developed and that they maintain. IRM is working with offices and regions that purchased commercial off-the-shelf software (COTS) packages that are not supported on an agency-wide basis to determine who will assume lead responsibility.

Progress reports will be reviewed continuously by the Year 2000 Program Manager, and deviations from established schedules will be reported to the CIO. If any such deviations are reported, the CIO will discuss them with the managers who are responsible for the systems. As part of this discussion, the CIO will determine the remedial actions to be taken. The CIO will periodically brief the Chairman, the

Executive Director for Operations, and the Chief Financial Officer of the NRC on any schedule deviations and the status of any remedial actions taken.

NRC YEAR 2000 CONTACT:	Arnold E. (Moe) Levin 301- 415-7458

APPENDIX B

YEAR 2000 AND OPERATING NUCLEAR POWER PLANTS

SCOPE OF THE YEAR 2000 PROBLEM AT OPERATING NUCLEAR POWER PLANTS

Discussions with vendors of digital protection systems Westinghouse, General Electric, Combustion Engineering, Foxboro, Allen Bradley, and Framatome/Babcock & Wilcox-confirmed the staff's determination that safety-related initiation and actuation systems (e.g., reactor trip system, engineered safety feature actuation system) are not subject to the Year 2000 concern. This determination was based on the fact that computer-based safety-related initiation and actuation systems do not rely on date-driven databases in order to perform their required functions. However, non-safety-related, but important, computer-based systems, primarily databases and data collection necessary for plant operations that are date driven, may need modification for Year 2000 compliance. Examples of systems that may be affected by Year 2000 problems are:

- security computers
- plant process (data scan, log, and alarm)/ Safety parameter display system computers
- emergency response systems
- radiation monitoring systems
- dosimeters/readers
- plant simulators
- engineering programs
- communication systems
- inventory control system
- technical specification surveillance tracking system

It should be noted that design deficiencies and nonconformances in computer systems resulting from the Year 2000 concern are subject to the existing requirements for reporting under 10 CFR Part 21 and 10 CFR Part 50.72 and 50.73 for those systems within the scope of these rgulations.

STATUS OF THE YEAR 2000 PROBLEM AT OPERATING NUCLEAR POWER PLANTS

Licensees of operating nuclear plants are aware of the Year 2000 issue. Based on discussions with the Nuclear Energy Institute (NEI), it is the staff's understanding that all licensees have initiated plans and actions to address the issue as it relates to the computer systems at their facilities.

On December 24, 1996, NRC issued Information Notice 96-70, "Year 2000 Effect on Computer System Software," to alert NRC licensees, certificate holders, and registrants of the potential problems their computer systems and software may encounter as a result of the change to the new century. The

information notice (IN) contained a discussion of how the Year 2000 issue may affect NRC licensees. The IN also contain information on the means to facilitate exchange of information among licensees, NRC, and the public via the NRC's World Wide Web server (www.nrc.gov). The IN encouraged licensees to designate a point of contact, examine their uses of computer systems and software well before the turn of the century and suggested that licensees consider actions appropriate to examine and evaluate their computer systems related to the Year 2000 issue.

NRR has incorporated guidance on recognition of the Year 2000 issue in the updated Standard Review Plan, NUREG-0800, Chapter 7, "Instrumentation and Control," which was issued in August 1997.

The Nuclear Utilities Software Management Group (NUSMG) held a Year 2000 workshop in July 1997 to identify, present, and discuss the approaches being taken by the nuclear industry related to the Year 2000 issue. There were 67 attendees representing 35 operating nuclear utilities, NEI, EPRI, NRC, and three vendors. The Year 2000 issue will be discussed at the NUSMG Semiannual Meeting in November 1997.

NEI met with nuclear plant utility representatives in August 1997 to formulate an industry-wide plan to address the Year 2000 issue. NEI plans to present the status of this work to the NRC in early October 1997.

The level of activities by the licensees in addressing the Year 2000 problem at their facilities varies considerably. At the NUSMG Year 2000 workshop held in July 1997, some licensees presented their ongoing and planned efforts in addressing the Year 2000 problem at their facilities. Some of these efforts appear to be comprehensive at addressing the Year 2000 problem. However, the status of actions being taken or planned industry-wide by nuclear power plant licensees is not clear at present.

ISSUES CONSIDERED MOST SIGNIFICANT

The significance of the Year 2000 problems at operating nuclear plants will vary from plant to plant, depending on the computer applications that are affected by the Year 2000 change and its consequences. Although the staff believes that safety-related safe shutdown systems will function as intended, nevertheless, in the worst case, the staff can hypothesize a scenario involving a potential common-mode failure to several non-safety-related, but important, computer-based systems necessary for plant operation that could significantly challenge the plant staff, e.g., a licensee could be faced with a plant trip as a result of a Year 2000 problem which results in the loss of offsite power and subsequent complications in tracking post-shutdown plant status and recovery due to a loss of emergency data collection and communications systems. Note that even under such a scenario, plant operators are trained to use their symptom-based emergency procedures and safety-related-post accident monitoring parameter indications to maintain safe plant shutdown conditions.

STRATEGY FOR DEALING WITH THE PROBLEM

Because of the concerns involving a potential common-mode failure type of event, as discussed previously, and since the Year 2000 problem has the potential to affect any computer system, including hardware that is microprocessor-based (embedded software), software, and data bases at nuclear power plants, the most effective strategy for the NRC would be to confirm implementation of an industry-wide effort, such as the one being planned by NEI.

In order to facilitate this action, the staff is considering a request for information pursuant to

10 CFR 50.54(f) to licensees of operating plants requesting designation of a point of contact, and a description of the programs planned or implemented to ensure Year 2000 compliance and their schedules. This request would ask for confirmation of any plan being implemented once the staff agrees that it sufficiently addresses the issue. Such an information request can be issued by the end of calendar year 1997. Meanwhile, the staff will work with NEI to generically address the Year 2000 issue. Whether the staff needs to take regulatory actions under 10 CFR 50.54(f) will be determined by the results of its interaction with NEI.

NRR YEAR 2000 CONTACT:	Jared S. Wermiel 301-415-2821

APPENDIX C

YEAR 2000 AND FUEL CYCLE AND MATERIALS LICENSEES

SCOPE OF THE YEAR 2000 PROBLEM FOR FUEL CYCLE AND MATERIALS LICENSEES

For fuel cycle and materials licensees, the scope of the Year 2000 potential problem involves security concerns, such as perimeter and other alarm systems that are computer controlled; material control and accounting concerns, such as automatic data systems that track inventories within the facility and record materials leaving the facility; and patient treatment concerns, such as calibration and treatment planning on equipment used for diagnostic and therapeutic medical applications, e.g., in hospitals and clinics.

STATUS OF THE YEAR 2000 PROBLEM FOR FUEL CYCLE AND MATERIALS LICENSEES

Most of the information concerning the current state of knowledge and activities by licensees has been gathered through informal means.

Fuel cycle licensees know about the Year 2000 problem, but they have not informed NRC of any significant problems that they have identified or corrected to date.

Informal contacts with several (approximately seven) large and small nuclear gauge manufacturers have revealed that they will have no Year 2000 problems. Most manufacturers indicated that either the programming or microprocessors do not perform functions that require a 4-digit date field or they already use 4-digit dates that will function correctly after the year 2000. Although the responses to these informal surveys have been positive, the possibility exists that some other manufacturers may have problems.

An informal conversation with an instructor of users of high-dose-rate (HDR) remote after-loading machines (used in medical brachytherapy therapeutic treatments) revealed that one manufacturer of HDR units, Nucletron, has already addressed the Year 2000 problem. Specifically, the treatment planning and source decay software utilize a 4-digit date field.

ISSUES CONSIDERED MOST SIGNIFICANT

Although each of the concerns noted above is important, we consider that the most significant concerns are those related to patient treatment. In this area, a large number of users of radioactive materials for medical diagnosis and treatment are involved, as well as a number of manufacturers of medical diagnostic and therapeutic equipment that contains computerized measurement and recording devices.

The potential impact of failure of these devices due to Year 2000 problem is large, based on their widespread use throughout the country in hospitals and clinics.

STRATEGY FOR DEALING WITH THE PROBLEM

Beginning in November 1996, NMSS has moved forward to alert licensees to the Year 2000 concerns and to emphasize their potential safety significance. On December 24, 1996, NMSS and NRR issued NRC Information Notice 96-70, "Year 2000 Effect on Computer System Software," which provided licensees, certificate holders, and registrants with background information on the Year 2000 problem and urged them to take appropriate action. Names and phone numbers of technical contacts were provided, along with brief instructions on using the NRC's World Wide Web page to obtain additional information. Also, licensees were encouraged to post questions, problems identified, and solutions on a NRC-maintained list server. Letters were also sent to nine professional organizations with copies of the information notice, asking the organizations to make the information available to their members. In July 1997, NMSS incorporated an inspection item on the Year 2000 issue into pilot Inspection Procedure 87115, "Nuclear Medicine Programs." As other inspection procedures on licensed materials programs are updated, this item will also be incorporated. This activity is expected to be completed in early 1998.

In addition, the June/July 1997 issue of the *NMSS Licensee Newsletter* included an article on and a copy of the June 25, 1997, letter from the U.S. Food and Drug Administration (FDA) to medical device manufacturers which alerted them to the fact that some computer systems and software applications, including microprocessors may be affected by the Year 2000 problem. The FDA letter also mentioned that computer-controlled design, production, or quality control processes could be adversely affected. Medical device manufacturers were reminded of their responsibilities with respect to device performance and encouraged to conduct hazard and safety analyses to determine Year 2000 compliance. On August 6, 1997, NMSS issued NRC Information Notice 97-61, "U.S. Department of Health and Human Services Letter to Medical Device Manufacturers," on the Year 2000 problem. This information notice was sent to all NRC medical licensees, and to veterinarians and manufacturers/distributors of medical devices, providing them copies of the FDA June 25 letter and providing them with the FDA's point of contact for information. No specific action or response on the part of licensees was required by this information notice.

More recently, to obtain additional information on the activities of materials, medical, and fuel cycle licensees, NMSS is implementing the following plan. A meeting of NMSS divisions was held to determine the extent of current knowledge of licensee activities and how to best acquire additional information on licensee activities. NMSS will begin, shortly, with the assistance of an individual from the Office of Nuclear Regulatory Research, to assess the status of selected licensees' activities for dealing with the Year 2000 problem and to note any problems identified through the licensees' efforts. A list of generic questions (questionnaire) is being developed that will be used for the assessment. The first such visit will be to a large broad-scope materials licensee. Subsequently, NMSS will assess the feedback from that visit, and adjust our approach, if necessary. Other licensees to be contacted may include the National Institutes of Standards Technology (NIST), one of the gaseous diffusion plants, and a fuel manufacturer. Following the evaluation of licensee responses to the questionnaire, NMSS will assess the need to issue more information notices or to take other actions, as appropriate.

In addition, NMSS is identifying vendors of medical devices to ascertain what actions they have taken or plan to take in regard to the Year 2000 problem.

The main focus of our activities in the near term will be to sensitize licensees to the Year 2000 problem, to gain an understanding of any safety and safeguards problems identified by the licensees, and to share that information with the industry.

NMSS YEAR 2000 CONTACT:	John J. Surmeier 301- 415-7823

November 15, 1999

The Honorable Robert F. Bennett, Chairman
Special Committee on the Year 2000 Technology Problem
United States Senate
Washington, D.C. 20515

Dear Mr. Chairman:

I am responding to your November 1, 1999 letter in which you express concern about the lack of public confidence in the nuclear industry's Year 2000 (Y2K) readiness and request information on certain specific matters. The Commission's responses to your specific questions are provided as Enclosure 1. This letter will summarize our overall activities to assure Y2K readiness.

The Commission recognizes that Y2K issues continue to be of widespread concern as the Year 2000 approaches. The Commission is confident, however, that the potential for Y2K-related disruptions have been addressed by NRC licensees. In that regard, as of November 4, all nuclear power plants have been reported as Y2K ready by the plant licensees. This includes preparation of contingency plans for the Y2K transition. The safe operation of the nuclear power plants is expected to contribute to a stable and reliable grid during the Y2K transition.

Over the past several years, the NRC staff has worked closely with nuclear industry organizations and licensees to address Y2K issues, and the NRC continues to maintain an appropriately aggressive regulatory framework for overseeing Y2K readiness efforts at all nuclear power plants. These activities, as summarized in Enclosure 2, provide an integrated and comprehensive approach for addressing Y2K issues. Moreover, in order to assure public confidence, the NRC has kept the public informed about industry and NRC Y2K activities through numerous media releases, responses to questions by telephone, electronic mail and letters, interviews with reporters, participation at workshops and public meetings, and maintenance of current Y2K information on NRC's Web site at <http://www.nrc.gov/NRC/NEWS/year2000.html>. This Web site identifies Y2K resources and has Y2K information on all operating nuclear power plants, including press releases, periodic reports, and other related information.

Nuclear power plant licensees have developed plans for their activities immediately before and after the Y2K transition. These plans were developed based on a Y2K contingency planning guidance document created by the Nuclear Energy Institute (NEI) in August of 1998 (NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning").

NEI/NUSMG 98-07, which was found to be acceptable by the staff, provides guidance in areas such as staffing, back-up communications, availability of supplies, and actions to be taken during the last days of 1999 and the first days of 2000.

In this connection, it should be noted that nuclear power plants have extensive emergency response plans and plant procedures to respond to events and equipment failures regardless of the initiating cause. Plant operators are trained to respond to off-normal situations, and periodic emergency response drills are conducted at all nuclear power plants. The use of these existing contingency plans or procedures for Y2K-related issues is also addressed in NEI/NUSMG 98-07. The document offers a focused approach to effective integrated contingency planning that builds on the Year 2000 readiness program and emergency response capability that nuclear utilities already have in place. The integrated contingency plan supplements existing plant procedures and is built from component and system contingency plans developed for specific risks from internal and external initiating events, as well as Y2K program insights.

In addition, the NRC staff conducted inspections of the Y2K contingency plans developed for each operating nuclear power plant as part of onsite Y2K reviews. These reviews confirmed that licensees have taken prudent and conservative measures to mitigate potential Y2K problems during the Y2K transition. Moreover, licensees have conducted drills to assure the adequacy of their planning. For example, during a July 14th NRC Y2K exercise involving Baltimore Gas and Electric, the State of Maryland and the counties surrounding the Calvert Cliffs nuclear power plant, Y2K contingency plan procedures were tested against a number of scenarios, including loss of power and loss of telecommunications. The exercise confirmed the adequacy of preparations for potential Y2K transition problems and ensured provisions were developed for dealing with them if they were to occur.

Nonetheless, despite these reviews and preparatory exercises and drills, the NRC has developed a comprehensive Y2K transition strategy as part of its own Y2K Contingency Plan in order to be able to respond to problems which may develop during the Y2K transition. The Contingency Plan encompasses augmented staffing at Headquarters and regional response centers, inspector monitoring of licensee activities during the transition period, enhanced communication capabilities, and procedures to respond to Y2K events. Moreover, on October 15, the NRC held a full-scale Y2K exercise to test its Contingency Plan. In that exercise, the NRC successfully responded to a variety of simulated Y2K problems at three fuel cycle facilities and 11 nuclear power plants, under circumstances in which a number of communication failures were also simulated. Despite overall success, improvements and specific lessons learned from this exercise are being incorporated in the NRC Contingency Plan. The Commission believes that licensee and NRC contingency plans provide assurance that the industry and NRC can respond to Y2K events, should they occur.

The NRC remains committed to its oversight of the nuclear power plant licensee Y2K-readiness efforts in order to ensure safe operation of these facilities throughout 1999, 2000, and beyond. Please contact me if you have any additional questions on this matter.

Sincerely,

/s/ Richard A. Meserve

Richard A. Meserve

Enclosures:
1. Responses to Questions
2. Summary of NRC Y2K Activities and Plant Readiness Status

November 15, 1999

The Honorable Christopher J. Dodd, Vice Chairman
Special Committee on the Year 2000 Technology Problem
United States Senate
Washington, D.C. 20510

Dear Mr. Vice Chairman:

I am responding to your November 1, 1999 letter in which you express concern about the lack of public confidence in the nuclear industry's Year 2000 (Y2K) readiness and request information on certain specific matters. The Commission's responses to your specific questions are provided as Enclosure 1. This letter will summarize our overall activities to assure Y2K readiness.

The Commission recognizes that Y2K issues continue to be of widespread concern as the Year 2000 approaches. The Commission is confident, however, that the potential for Y2K-related disruptions have been addressed by NRC licensees. In that regard, as of November 4, all nuclear power plants have been reported as Y2K ready by the plant licensees. This includes preparation of contingency plans for the Y2K transition. The safe operation of the nuclear power plants is expected to contribute to a stable and reliable grid during the Y2K transition.

Over the past several years, the NRC staff has worked closely with nuclear industry organizations and licensees to address Y2K issues, and the NRC continues to maintain an appropriately aggressive regulatory framework for overseeing Y2K readiness efforts at all nuclear power plants. These activities, as summarized in Enclosure 2, provide an integrated and comprehensive approach for addressing Y2K issues. Moreover, in order to assure public confidence, the NRC has kept the public informed about industry and NRC Y2K activities through numerous media releases, responses to questions by telephone, electronic mail and letters, interviews with reporters, participation at workshops and public meetings, and maintenance of current Y2K information on NRC's Web site at <http://www.nrc.gov/NRC/NEWS/year2000.html>. This Web site identifies Y2K resources and has Y2K information on all operating nuclear power plants, including press releases, periodic reports, and other related information.

Nuclear power plant licensees have developed plans for their activities immediately before and after the Y2K transition. These plans were developed based on a Y2K contingency planning guidance document created by the Nuclear Energy Institute (NEI) in August of 1998 (NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning").

NEI/NUSMG 98-07, which was found to be acceptable by the staff, provides guidance in areas such as staffing, back-up communications, availability of supplies, and actions to be taken during the last days of 1999 and the first days of 2000.

In this connection, it should be noted that nuclear power plants have extensive emergency response plans and plant procedures to respond to events and equipment failures regardless of the initiating cause. Plant operators are trained to respond to off-normal situations, and periodic emergency response drills are conducted at all nuclear power plants. The use of these existing contingency plans or procedures for Y2K-related issues is also addressed in NEI/NUSMG 98-07. The document offers a focused approach to effective integrated contingency planning that builds on the Year 2000 readiness program and emergency response capability that nuclear utilities already have in place. The integrated contingency plan supplements existing plant procedures and is built from component and system contingency plans developed for specific risks from internal and external initiating events, as well as Y2K program insights.

In addition, the NRC staff conducted inspections of the Y2K contingency plans developed for each operating nuclear power plant as part of onsite Y2K reviews. These reviews confirmed that licensees have taken prudent and conservative measures to mitigate potential Y2K problems during the Y2K transition. Moreover, licensees have conducted drills to assure the adequacy of their planning. For example, during a July 14th NRC Y2K exercise involving Baltimore Gas and Electric, the State of Maryland and the counties surrounding the Calvert Cliffs nuclear power plant, Y2K contingency plan procedures were tested against a number of scenarios, including loss of power and loss of telecommunications. The exercise confirmed the adequacy of preparations for potential Y2K transition problems and ensured provisions were developed for dealing with them if they were to occur.

Nonetheless, despite these reviews and preparatory exercises and drills, the NRC has developed a comprehensive Y2K transition strategy as part of its own Y2K Contingency Plan in order to be able to respond to problems which may develop during the Y2K transition. The Contingency Plan encompasses augmented staffing at Headquarters and regional response centers, inspector monitoring of licensee activities during the transition period, enhanced communication capabilities, and procedures to respond to Y2K events. Moreover, on October 15, the NRC held a full-scale Y2K exercise to test its Contingency Plan. In that exercise, the NRC successfully responded to a variety of simulated Y2K problems at three fuel cycle facilities and 11 nuclear power plants, under circumstances in which a number of communication failures were also simulated. Despite overall success, improvements and specific lessons learned from this exercise are being incorporated in the NRC Contingency Plan. The Commission believes that licensee and NRC contingency plans provide assurance that the industry and NRC can respond to Y2K events, should they occur.

The NRC remains committed to its oversight of the nuclear power plant licensee Y2K-readiness efforts in order to ensure safe operation of these facilities throughout 1999, 2000, and beyond. Please contact me if you have any additional questions on this matter.

Sincerely,

/s/ Richard A Meserve

Richard A. Meserve

Enclosures:
1. Responses to Questions
2. Summary of NRC Y2K Activities and Plant Readiness Status

RESPONSE TO QUESTIONS

1. Provide a list of nuclear power plants and how their mission-critical systems were validated as Y2K-ready, categorized according to the following: internal quality assurance, external review, and independent validation and verification. As possible, describe the equivalence and differences in such approaches.

Answer.

NRC does not have a categorized list showing specifically how each nuclear power plant validated the Y2K readiness of mission-critical systems, conducted internal quality assurance audits, or provided external reviews. However, readiness activities have been completed at all nuclear power plants over the past two years in accordance with NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness." NEI/NUSMG 97-07, which was found acceptable by NRC, includes guidance regarding validation of system readiness and quality assurance measures. The completion dates for the NRC reviews of licensee Y2K activities at each nuclear power plant are listed in the Attachment to this enclosure. The staff's reviews confirmed that the licensees utilized NRC-inspected quality assurance (QA) programs and processes required by NRC regulations, while completing Y2K activities.

Y2K QA measures are an outgrowth of nuclear QA programs and processes that are in place at all nuclear reactors and that provide an independent assurance in the quality of licensee activities. Internal QA activities, external reviews and independent verification and validation all contribute to providing a high confidence in the licensee's actions to achieve Y2K readiness.

Internal QA activities consist of those activities normally performed by the licensee during plant modifications or routine maintenance activities. Licensee management reviews plant modification and maintenance activities and ensures they are conducted according to approved plant procedures and quality assurance requirements. For safety-related systems and mission-critical systems, an independent check of the plant modification or maintenance activity is conducted by another technician or engineer, depending on the activity.

External reviews of plant modifications or maintenance activities are performed by an independent group, such as the licensee's Quality Assurance Group, or a peer group from an external organization. The results and recommendations from these reviews are provided to licensee senior management as a means of improving the licensee's internal processes. For Y2K-readiness preparations, these peer group reviews were conducted by members from other licensees, industry experts, and Nuclear Energy Institute (NEI) staff. Several of these peer group audits were reviewed by the NRC in the initial 12 audits it conducted between September 1998 and February 1999 (see Enclosure 2). Specifically, in March 1999, the nuclear industry reported to the North American Electric Reliability Council (NERC) that 65 of 66 sites had at least one industry audit. (The last facility audit was completed in April 1999.) Industry audits included 56 audits by utility quality assurance departments, 36 cross-utility audits, and 46 third-party industry audits. Most facilities have conducted multiple audits, as reflected by the sum of 139 reported audits at the 66 reactor sites (which comprise all 103 operating nuclear power plants). In short, all reactor sites have received at least one independent industry audit of their Y2K program.

Question 1. (continued)

In addition, independent verification and validation (IV&V) of software modification activities for systems and components were performed using the criteria for independence required by 10 CFR Part 50 Appendix B. IV&V is part of the licensee's normal software modification and maintenance practices for safety-related and mission-critical applications. It entails a specific degree of technical, managerial, and financial independence from the development organization.

As described in detail in Enclosure 2, NRC Y2K reviews conducted at each operating reactor site confirmed that licensees have implemented appropriate QA measures to provide a high level of confidence in their Y2K programs. The staff has concluded that sufficient independent validation has occurred in connection with licensee Y2K programs.

Attachment: NRC Y2K Nuclear Power Plant
Inspection Completion Dates

2. Provide detailed information about voluntary pledges by industry representatives to maintain a 30-45 day supply of emergency diesel generator fuel, and other voluntary measures to reduce the risk of plant failure.

Answer.

No industry representatives have pledged to NRC to maintain a 30-45 day supply of diesel fuel onsite and there are no NRC requirements for fuel supplies of this nature. However, provision for adequate fuel supply is a requirement in the plant technical specifications (TSs). This is generally a week's supply of fuel per diesel generator, based on the demands of loading under accident conditions. The TSs are intended to ensure that sufficient power will be available to supply safety-related equipment at all times. The capability of diesel generators and the adequacy of existing fuel supplies have been demonstrated at numerous plants during weather-induced interruptions of the power grid and other cases of loss of offsite power (LOOP) from the grid. An example is the Turkey Point nuclear plant LOOP event during Hurricane Andrew (August 1992) when the diesel generators automatically picked up safety-related loads and maintained the plant for an extended period (over 6 days). NRC considers the current fuel capacity requirements to be sufficient to operate diesel generators for longer than the time that it takes to replenish the onsite supply from outside sources for a postulated extended loss of offsite power.

Based on its onsite reviews, the staff is aware that many licensees are planning to take precautionary measures and have additional fuel oil onsite as part of their site-specific Y2K contingency planning efforts. Plants have addressed fuel supply requirements based upon such factors as the projected grid conditions during the critical Y2K dates and the Y2K readiness of the supplier. Typically, as part of Y2K contingency planning, licensees are planning to "top-off" supplies of consumables (such as diesel fuel, chemicals, and gases) and to confirm supply arrangements with vendors, including diesel fuel oil vendors. For economic reasons not related to Y2K, some licensees have additional onsite fuel storage that can accommodate more than a 7-day period. NRC's Y2K Contingency Plan implementing procedures provide guidance to resident inspectors to verify before the transition period that there is an adequate supply of consumables and that licensees have "topped-off" their fuel oil tanks. However, there is no formal process established to verify these actions and we do not believe one is necessary because of the requirement that licensees conform to TSs.

Consistent with NEI/NUSMG 98-07 guidelines, licensees are taking other measures to reduce plant risk during the Y2K transition. Some examples include augmented staff, walkthroughs, special monitoring of systems, establishment of supplemental communications capability (such as satellite phones), and additional communication checks with offsite support agencies. Consistent with the NRC's Y2K contingency planning and guidelines, NRC resident inspectors are expected to oversee important plant-specific contingency plan implementation activities by the licensees.

3. Provide a description of the process by which NRC will make a final determination as to which NPP, if any, will be shut down for safety concerns during the rollover period.

Answer.

Licensees are required to operate their facilities safely in compliance with NRC's regulations and the specific conditions of facility licenses. Plant Technical Specifications (TSs), which are part of the facility license, provide criteria for plant shutdown if systems or components are inoperable for any reason. This would include situations in which systems or components are inoperable due to a Y2K deficiency. If the NRC should identify a situation in which the Y2K issue results in a plant being in noncompliance with its license or NRC regulations, the NRC has the authority to issue an immediately effective order to the licensee requiring that the nuclear power plant be placed in a safe condition. This includes shutting down a plant, if warranted. The NRC is prepared to issue such an order, in the unlikely event that such action is appropriate.

In summary, the NRC’s current process of monitoring licensee safety performance and conformance to its license, the TSs, and NRC regulations will enable the NRC to address any need for plant shutdowns over the rollover period. At this time, we believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond, and we do not believe that significant plant-specific action directed by the NRC to address possible Y2K problems is likely to be needed.

4. Provide the minimal safety standards that will be acceptable under the proposed suspension of technical regulations.

Answer.

The NRC is not proposing a suspension of regulations during the Y2K transition. In fulfilling its primary responsibility to protect public health and safety, the NRC uses regulations and license conditions as the fundamental building blocks of its regulatory program. There are two classes of regulatory requirements: regulations that generally apply to all facilities, and plant-specific technical specifications (TSs) that reflect each facility's unique design features. The TSs establish minimum operating criteria for the facility, including “Limiting Conditions for Operation” (LCOs). An LCO is the lowest functional capability or performance level of a piece of equipment or a system that is required for the safe operation of the facility. When an LCO is not met, remedial action is required within a time specified in the TSs to restore compliance with the LCO.

The NRC expects all nuclear power plant licensees to operate their facilities safely in compliance with the NRC regulations and requirements, including the plant TSs. This expectation is true at all times, including during the Y2K transition period. Accordingly, the minimal acceptable safety standards during the Y2K rollover period will continue to be the same as those during any other period -- that is, full compliance with the NRC requirements and plant TSs.

Under rare circumstances -- circumstances not expected to be involved in the Y2K transition -- the NRC may allow temporary noncompliance with a TS. This situation arises because it is not possible to anticipate every contingency that might arise during the lifetime of a facility. Circumstances occasionally arise in which a licensee foresees that compliance with an NRC requirement would involve an unnecessary plant transient or startup delay, or that performance of testing, inspection, or system realignment is inappropriate under the specific plant conditions. For these rare and limited circumstances, the NRC's "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy, NUREG-1600), permits the NRC, at its discretion, either to defer or not enforce the applicable TS. In these cases, a licensee may request that the NRC exercise its discretion to refrain from enforcing the applicable TS before a violation occurs. This type of enforcement discretion is designated as a Notice of Enforcement Discretion (NOED) and is addressed in Section VII.C of the Enforcement Policy. The NRC will take such an action and issue a NOED only when it is clearly satisfied that this is consistent with the agency's mission to protect public health and safety.

Further, in each case in which the NRC staff has chosen to issue a NOED, enforcement action will normally be taken for the root causes, to the extent violations were involved, that led to the noncompliance for which enforcement discretion was used. The enforcement action is intended to emphasize that licensees should not rely on the NRC's authority to exercise enforcement discretion as a routine substitute for compliance or for requesting a license amendment. Staff guidance for implementing the NOED policy appears in the NRC Inspection Manual Chapter Part 9900.

Question 4. (continued)

The NRC is actively working with the industry groups and licensees to assure that Y2K-related issues affecting US nuclear power plants are identified and corrected well before December 31, 1999. At this time all nuclear power plants are declared Y2K ready. Although the need should be unlikely, the NRC has developed an Interim Enforcement Policy for addressing potential Y2K-related contingencies. We recognize that, despite every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to Y2K problems. The Interim Enforcement Policy is a special situation of the NOED policy which is effective during the Y2K rollover and transition period. This policy was published in the Federal Register on July 30, 1999, and a copy is attached.

The exercise of enforcement discretion may support a licensee's decision to keep the plant in operation despite potential noncompliance with the license, if the licensee has determined that safety will not be unacceptably affected, in order to help maintain electrical grid stability and reliability. Accordingly, the NRC's Interim Enforcement Policy provides for granting NOEDs to allow continued operation when, despite licensees' best efforts, nuclear facilities face Y2K-related issues involving very little risk but resulting in potential noncompliance with the license and otherwise requiring shutdown. In such circumstances, the NRC will balance the overall public health and safety as a result of the facility not operating against potentially small increases in radiological risk or other hazards associated with continued operation. When the NRC determines that plant safety will not be unacceptably affected by exercising the discretion, it may grant a NOED.

The NRC will grant a NOED only when it is clearly satisfied that its action is consistent with the agency's mission to protect public health and safety. It is important to note that although the Interim Enforcement Policy is a prudent contingency measure for any unlikely Y2K-induced problems, the NRC is under no obligation to (and will not) exercise discretion merely because a licensee requests it to do so.

Attachment: Federal Register Notice

NRC Y2K Nuclear Power Plant Inspection Completion Dates

Details of inspection activity are contained in NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," dated September 1999. Program reviews consisted of evaluating licensee programs, ensuring that the Y2K remediation efforts were being completed in accordance with NRC-endorsed industry guidance, NEI/NUSMG 97-07, “Nuclear Utility Year 2000 Readiness” and NEI/NUSMG 98-07, “Nuclear Utility Year 2000 Readiness Contingency Planning.” Followup reviews were completed between July 1 and August 13, 1999, at 14 plants where licensee activities were insufficiently complete at the time of the staff's program review.

In Generic Letter (GL) 98-01 NRC required licensees to report their Y2K readiness status by July 1, 1999. Licensee’s that were not ready by July 1, were directed to provide their schedules for completing Y2K activities. Final reviews were only conducted at those plants which had not reported Y2K readiness on or before July 1, 1999. Cooper Nuclear Station received a final review because after having reported being Y2K ready on July 1, it discovered a potential Y2K issue that required further resolution.

Plant Name	Program Review Completed	Follow-up Review Completed	Final Review Completed
Arkansas Nuclear One, Unit 1	6/8/99	7/21/99	
Arkansas Nuclear One, Unit 2	6/8/99	7/21/99	
Braidwood, Unit 1	6/4/99		
Braidwood, Unit 2	6/4/99		
Beaver Valley Power Station, Unit-1	5/17/99	8/6/99	10/28/99
Beaver Valley Power Station, Unit-2	5/17/99	8/6/99	10/28/99
Browns Ferry Nuclear Power Station, Unit-2	6/14/99		10/20/99
Browns Ferry Nuclear Power Station, Unit-3	6/14/99		10/20/99
Brunswick Steam Electric Plant, Unit-1	6/16/99		9/10/99
Brunswick Steam Electric Plant, Unit 2	6/16/99		
Byron Unit 1	4/29/99		
Byron Unit 2	4/29/99		
Callaway	5/11/99		
Calvert Cliffs, Unit 1	4/23/99		
Calvert Cliffs, Unit 2	4/23/99		
Catawba, Unit 1	5/26/99		
Catawba, Unit 2	5/26/99		
Clinton Power Station, Unit-1	6/4/99		10/20/99
Comanche Peak Steam Electric Plant, Unit-1	6/22/99		11/3/99
Comanche Peak Steam Electric Plant, Unit-2	6/22/99		11/3/99
Cooper Nuclear Station	5/28/99	8/12/99	9/29/99
Crystal River Unit 3	6/11/99		
Davis-Besse Nuclear Power Station	4/26/99		8/3/99

ATTACHMENT TO QUESTION 1

Plant Name	Program Review Completed	Follow-up Review Completed	Final Review Completed
Diablo Canyon Nuclear Power Plant, Unit-1	6/17/99		9/30/99
Diablo Canyon Nuclear Power Plant, Unit-2	6/17/99		9/30/99
Donald C. Cook Nuclear Plant, Unit-1	5/24/99		11/4/99
Donald C. Cook Nuclear Plant, Unit-2	5/24/99		11/4/99
Dresden Unit 2	6/24/99		
Dresden Unit 3	6/24/99		
Duane Arnold	5/14/99		
Farley, Unit 1	4/17/99		
Farley, Unit 2	4/17/99		11/4/99
Fermi, Unit 2	5/3/99		
Fitzpatrick	4/30/99		
Fort Calhoun	5/13/99		
Ginna	5/14/99		
Grand Gulf	6/4/99	7/22/99	
Hatch, Unit 1	6/7/99		
Hatch, Unit 2	6/7/99		
Hope Creek Nuclear Station, Unit-1	5/24/99		11/1/99
Indian Point 2	5/14/99	8/3/99	
Indian Point 3	5/19/99		
Kewaunee	5/28/99		
LaSalle, Unit 1	5/21/99		
LaSalle, Unit 2	5/21/99		
Limerick Generating Station, Unit 1	6/8/99		
Limerick Generating Station, Unit-2	6/8/99		10/4/99
McGuire, Unit 1	5/25/99		
McGuire, Unit 2	5/25/99		
Millstone, Unit 2	6/18/99		
Millstone, Unit 3	6/18/99		
Monticello	6/8/99		8/3/99
Nine Mile Point, Unit 1	6/4/99		
Nine Mile Point, Unit 2	6/4/99		
North Anna Power Station, Unit-1	6/11/99		
North Anna Power Station, Unit-2	6/11/99		9/13/99
Oconee, Unit 1	6/8/99		
Oconee, Unit 2	6/8/99		
Oconee, Unit 3	6/8/99		
Oyster Creek Nuclear Generating Station	6/11/99		10/4/99
Palisades	5/5/99		
Palo Verde, Unit 1	6/10/99		

Plant Name	Program Review Completed	Follow-up Review Completed	Final Review Completed
Palo Verde, Unit 2	6/10/99		
Palo Verde, Unit 3	6/10/99		
Peach Bottom Atomic Power Station, Unit-2	5/28/99		10/20/99
Peach Bottom Atomic Power Station, Unit-3	5/28/99		11/1/99
Perry Nuclear Power Plant	5/28/99		8/3/99
Pilgrim	5/28/99		
Point Beach, Unit 1	6/24/99		
Point Beach, Unit 2	6/24/99		
Prairie Island, Unit 1	5/5/99	7/29/99	
Prairie Island, Unit 2	5/5/99	7/29/99	
Quad Cities, Unit 1	6/8/99		
Quad Cities, Unit 2	6/8/99		
River Bend	5/12/99	8/6/99	
Robinson	5/23/99		
Salem Nuclear Generating Station, Unit-1	5/25/99		10/19/99
Salem Nuclear Generating Station, Unit-2	5/25/99		10/19/99
San Onofre, Unit 2	6/10/99		
San Onofre, Unit 3	6/10/99		
Seabrook	5/27/99		
Sequoyah Nuclear Plant, Unit-1	5/27/99		10/20/99
Sequoyah Nuclear Plant, Unit-2	5/27/99		10/20/99
Shearon Harris	4/15/99		
STP Electric Generating Station, Unit-1	6/11/99		10/22/99
STP Electric Generating Station, Unit-2	6/11/99		10/22/99
St. Lucie, Unit-1	6/24/99		8/11/99
St. Lucie, Unit-2	6/24/99		8/11/99
Summer	5/10/99	7/27/99	
Surry, Unit 1	6/11/99		
Surry, Unit 2	6/11/99		
Susquehanna, Unit 1	5/10/99		
Susquehanna, Unit 2	5/10/99		
Three Mile Island Nuclear Station, Unit-1	6/4/99	8/6/99	10/26/99
Turkey Point, Unit-3	5/20/99		7/30/99
Turkey Point, Unit-4	5/20/99		7/30/99
Vermont Yankee Nuclear Power Station	5/14/99	8/11/99	10/4/99
Vogtle, Unit 1	5/13/99		
Vogtle, Unit 2	5/13/99		
Washington Nuclear Plant, Unit 2	6/11/99		
Waterford 3	5/14/99	7/24/99	

Plant Name	Program Review Completed	Follow-up Review Completed	Final Review Completed
Watts Bar Nuclear Power Plant	5/25/99		10/20/99
Wolf Creek	6/9/99		

Y2K Enforcement Discretion Federal Register Notice Dated July 30, 1999
(Volume 64, Number 146)

NUCLEAR REGULATORY COMMISSION
[NUREG-1600, Revision 1]
Policy and Procedure for NRC Enforcement Actions; Interim Enforcement Policy
Regarding Enforcement Discretion for Nuclear Power Plants
During the Year 2000 Transition

AGENCY: Nuclear Regulatory Commission.

ACTION: Policy statement; amendment.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, Revision 1 (Enforcement Policy), by adding Appendix E. This amendment adds an interim enforcement policy that the NRC will follow to exercise enforcement discretion for noncompliance with license conditions, including technical specifications (TSs), because of year 2000 (Y2K) related situations.

DATES: This action is effective August 30, 1999. Comments on this revision should be submitted within 30 days of publication in the Federal Register and will be considered by the NRC prior to the next Enforcement Policy revision.

ADDRESSES: Submit written comments to David L. Meyer, Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mail Stop T-6 D59, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland, between 7:30 a.m. and 4:15 p.m., Federal workdays. Copies of comments received may be examined at the NRC Public Document Room, 2120 L Street, NW, (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Richard Wessman, Deputy Director, Division of Engineering, 301-415-3298, or Allen Hansen, Lead Project Manager, Division of Licensing Project Management, 301-415-1390, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

SUPPLEMENTARY INFORMATION:

Background

Y2K-related events arise from a date-related problem that is experienced by a software system, a software application, or a digital device at a key rollover date when the system, application, or device does not perform its intended function. The key rollover dates are January 1, 2000; February 29, 2000 (an uncommon leap day); and December 31, 2000 (the 366th day of an uncommon leap year). The nuclear utility industry is engaged in Y2K readiness programs at all nuclear power plant facilities to seek out and correct Y2K-related problems that have any potential to adversely affect facility operations.

ATTACHMENT TO QUESTION 4

Y2K concerns result from licensees' reliance upon

(1) Software to schedule maintenance and technical specification surveillances;

(2) Programmable logic controllers and other commercial off-the-shelf software and hardware;

(3) Digital process control systems;

(4) Software to support facility operation;

(5) Digital systems for collection of operating data; and

(6) Digital systems to monitor post-accident plant conditions.

It is recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could adversely affect the facility (for example, interruption of communications or partial loss of offsite power).

The electricity production and delivery systems, as two of the more important elements of the North American economic and social infrastructure, must remain dependable during Y2K transition or rollover periods. Most other critical elements of the infrastructure depend on the availability of an interconnected, stable, and reliable supply of electrical power. There is no doubt that cascading or even localized outages of generators and transmission facilities could have serious short-term and long-term consequences.

Continued safe operation of nuclear power plants during Y2K transition or rollover periods will play a major role in maintaining stable and reliable electrical power supply systems, providing necessary reserve power if there are major losses at other generating facilities. The NRC staff is issuing interim guidance on the process for the NRC to exercise enforcement discretion in certain situations where power reactor licensees encounter Y2K-associated compliance problems in the Y2K transition period (December 31, 1999, through the first few days of 2000) or in other key rollover periods. The exercise of enforcement discretion may support a licensee decision to keep the plant in operation, if the licensee has determined that safety will not be unacceptably affected, in order to help maintain electrical grid stability and reliability. The NRC Headquarters Operations Center and the NRC Region IV Incident Response Center will have staff augmented during the key transition from December 31, 1999, to January 1, 2000, to ensure that appropriate actions can be taken for any regulatory issues that arise.

Scope

This interim enforcement policy provides for the exercise of enforcement discretion to address noncompliance with license conditions, including TSs, because of Y2K transition or rollover issues. The interim enforcement policy applies to situations in which plant operation is needed to help maintain the stability and reliability of the electrical power supply system, even when license conditions, including TSs, would require a plant shutdown. If such situations occur, licensees are expected to follow the existing guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion <http://www.nrc.gov/NRC/IM/noed.html> to the maximum

extent practicable, particularly regarding a safety determination and notification of NRC. Licensees may decide to continue operations upon making a determination that it is safe and prudent to do so to help maintain electrical grid stability and reliability, and when certain criteria are met. This enforcement discretion does not extend to situations in which the licensee may be unable to communicate with the NRC. (The staff assessment of telecommunications capability indicates that a loss of all telecommunications between NRC and licensees is highly unlikely.)

To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was used. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision. Consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include the assessment of civil penalties and the issuance of orders.

Paperwork Reduction Act Statement

This interim policy statement does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval number 3150-0136.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

The NRC is revising the NRC Enforcement Policy by adding Appendix E to read as follows:

GENERAL STATEMENT OF POLICY AND PROCEDURE FOR NRC ENFORCEMENT ACTIONS

* * * * *

Appendix E: Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition

This appendix sets forth the interim enforcement policy that will govern the exercise of enforcement discretion by the NRC staff when licensees of operating nuclear power plants find it necessary to deviate from license conditions, including technical specifications (TSs), in those cases in which year 2000 (Y2K) related complications would otherwise require a plant shutdown that could adversely affect the stability and reliability of the electrical power grid. This policy does not extend to situations in which a licensee may be unable to communicate with the NRC.

The policy is effective August 30, 1999, and will remain in effect through January 1, 2001. This policy only applies during Y2K transition or rollover periods (December 31, 1999, through January 3, 2000; February 28, 2000, through March 1, 2000; and December 30, 2000, through January 1, 2001). During these periods, a licensee may contact the NRC Headquarters

Operations Center and seek NRC enforcement discretion with regard to the potential noncompliance with license conditions, including TSs, if the licensee has determined that:

(a) Complying with license conditions, including TSs, in a Y2K-related situation would require a plant shutdown;

(b) Continued plant operation is needed to help maintain a reliable and stable grid; and

(c) Any decrease in safety as a result of continued plant operation is small (considering both risk and deterministic aspects), and reasonable assurance of public health and safety, the environment, and security is maintained with the enforcement discretion.

Licensees are expected to follow the existing guidance as stated in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. A licensee seeking NRC enforcement discretion must provide a written justification, or in circumstances in which good cause is shown, an oral justification followed as soon as possible by written justification. The justification must document the need and safety basis for the request and provide whatever other information the NRC staff needs to make a decision regarding whether the exercise of discretion is appropriate. The NRC staff may grant enforcement discretion on the basis of balancing the public health and safety or common defense and security of not operating against potential radiological or other hazards associated with continued operation, and a determination that safety will not be unacceptably affected by exercising the discretion. The Director of the Office of Nuclear Reactor Regulation, or designee, will advise the licensee whether the NRC has approved the licensee's request and, if so, will subsequently confirm the exercise of discretion in writing. Enforcement discretion will only be exercised if the NRC staff is clearly satisfied that the action is consistent with protecting public health and safety and is warranted in the circumstances presented by the licensee.

If the volume of requests to the NRC Headquarters Operations Center is such that the NRC staff cannot review and approve all licensee requests in a timely fashion, the NRC staff will obtain the safety-significant information from the licensee to enable the NRC staff to make a prompt initial assessment. Unless the assessment is unfavorable, the licensee would be permitted to proceed with its planned course of action. The NRC staff will complete these assessments as time permits and the licensee will be advised of the results orally, if possible, and then in writing. If the NRC staff's prompt initial assessment or subsequent assessment determines that a licensee's actions raise safety concerns, the licensee would be so informed. The licensee would then be required to follow its license conditions, including TSs.

If there are communications difficulties between the licensee and the NRC, the licensee is encouraged to interact with the NRC inspector onsite who will have a dedicated satellite telephone. The inspector should be able to facilitate communication with the NRC Headquarters Operations Center and/or the NRC Regional Incident Response Centers (IRCs). If communication with the NRC Headquarters Operations Center is not possible, then the licensee should contact the IRC in NRC Region IV to discuss enforcement discretion. Similarly, if the Region IV IRC cannot be reached, then the licensee should attempt to contact the Region I, II and III IRCs. Although it is considered highly unlikely, if communication with NRC is not possible, the licensee should follow the plant license conditions, including technical specifications.

In conducting its assessments, the licensee should follow, to the extent practicable, the guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion. Contrary to Part 9900 Section B.3 guidance, it is not necessary for an emergency to be declared by a government entity. Licensees are encouraged to contact NRC early in their evaluation process, particularly if time is of the essence, even though complete information as specified in Part 9900 may not be available.

The decision to exercise enforcement discretion does not change the fact that the licensee will be in noncompliance nor does it imply that enforcement discretion is being exercised for any noncompliance that may have led to the noncompliance at issue. To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was granted. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision. Consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include assessment of civil penalties and the issuance of orders.

Dated at Rockville, Maryland, this 26th day of July, 1999.

For the Nuclear Regulatory Commission.

/s/

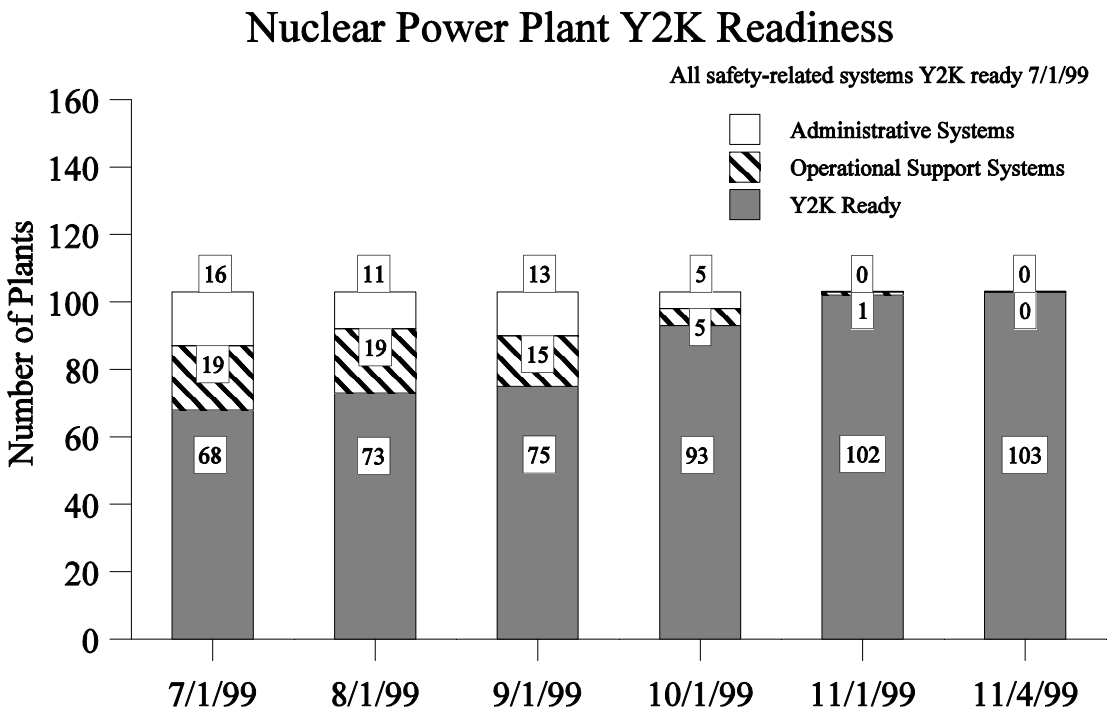
Annette Vietti-Cook,
Secretary of the Commission.

SUMMARY OF NRC Y2K ACTIVITIES AND PLANT READINESS STATUS

Since 1996, the NRC has worked with nuclear power plant licensees and the Nuclear Energy Institute (NEI), an industry organization, to assure plant systems are "Y2K ready" before the Year 2000. To ensure that potential Y2K issues are identified and corrected, the NRC issued Information Notice (IN) 96-70, “Year 2000 Effect on Computer System Software,” December 24, 1996; Generic Letter (GL) 98-01, “Year 2000 Readiness of Computer Systems at Nuclear Power Plants,” May 11, 1998; and GL 98-01, Supplement 1, “Year 2000 Readiness of Computer Systems at Nuclear Power Plants,” January 14, 1999. IN 96-70 informed all licensees of the potential problems that nuclear facility computer systems and software might encounter during the transition to the new century. In GL 98-01 reference is made to Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, “Nuclear Utility Year 2000 Readiness,” which describes an approach that all licensees have agreed to utilize in addressing the Y2K issues at their facilities. In GL 98-01 the NRC accepted the NEI/NUSMG 97-07 guidance as an appropriate program for nuclear power plant readiness and required that all operating U.S. nuclear power plant licensees submit written responses regarding their facility-specific Y2K readiness by July 1, 1999. Licensees that were not ready were requested to provide their schedule for completing their Y2K activities. Supplement 1 to GL 98-01 expanded the scope of the reporting requirements to include the systems that are necessary for continued plant operation and that are not covered by the terms and conditions of the plant’s license and NRC regulations.

By July 1, 1999, licensees for all 103 operating nuclear power plants reported the status of their Y2K readiness to the NRC. Regarding NRC’s highest priority–the uninterrupted performance of plant safety systems–all nuclear power plants reported that their efforts were complete and that no remaining Y2K-related problems existed that could directly affect the performance of safety systems or the capability for safe shutdown. Sixty-eight of these plants had also completed the next order of priority as of July 1, stating that all of their computer systems that support plant operation were "Y2K ready." The remaining 35 plants reported that, to be fully Y2K ready, they still had additional work to complete on a few <u>non-safety</u> computer systems or devices. Typically, the remaining Y2K work was awaiting a scheduled plant outage or the delivery of a replacement component. In each case, the licensees with work remaining submitted schedules for completing that work. Final reviews were performed at the 35 plants, as well as at Cooper Nuclear Station. Cooper received a final review because, after having reported being Y2K ready on July 1, it discovered a potential Y2K issue that required further resolution.

As of November 4, 1999, the NRC received Y2K readiness status reports from licensees indicating that all 103 nuclear power plants are fully Y2K ready -- that is, all plant systems involved with safety, power generation, and plant support are now ready to roll over into the Year 2000 without computer problems. The following chart illustrates plant readiness.



One of a number of initiatives undertaken by the NRC staff to verify and assess the effectiveness of licensee Y2K readiness programs was the conduct of the following 12 sample audits of licensee Y2K readiness programs:

DATE	PLANT	LOCATION
September 1998	Monticello	Minnesota
	Seabrook	New Hampshire
October 1998	Brunswick	North Carolina
	Hope Creek	New Jersey
	Davis Besse	Ohio
November 1998	Wolf Creek	Kansas
	Watts Bar	Tennessee
	Limerick	Pennsylvania
December 1998	Waterford	Louisiana
January 1999	Braidwood	Illinois
	WNP-2	Washington
	North Anna	Virginia

The NRC staff determined that this approach was an appropriate means of oversight of licensee Y2K readiness efforts because all licensees had committed to the nuclear power industry Y2K readiness guidance (NEI/NUSMG 97-07) in their first response to NRC GL 98-01 and because the NRC staff had not found any Y2K problems in safety-related actuation systems. The sample of 12 licensees included large utilities, such as Commonwealth Edison and Tennessee Valley Authority,

as well as small single-unit licensees, such as North Atlantic Energy (Seabrook) and Wolf Creek Nuclear Operating Corporation. Because licensee Y2K programs are corporate-wide, many of the NRC staff audits encompassed more than a single nuclear power plant site because many utilities own more than one nuclear power plant. In all, 42 of 103 operating nuclear power plant units were associated with the Y2K readiness program audits of 12 utilities. The NRC staff also selected a variety of types of plants of different ages and locations in this sample in order to obtain the necessary assurance that nuclear power industry Y2K readiness programs were being effectively implemented and that licensees would be on schedule to meet the readiness target date of July 1, 1999, established in GL 98-01. In late January 1999, the NRC staff completed the 12 audits. On the basis of the audit findings, the staff concluded that the audited licensees were in the process of effectively addressing Y2K issues and were undertaking the actions necessary to achieve Y2K readiness in accordance with the GL 98-01 target date. These findings were consistent with those reported by the Department of Energy in a report prepared by the North American Electric Reliability Council on the status of Y2K readiness of the electric power grid.

In an effort to verify and assess the effectiveness of licensee contingency planning, in May and June 1999, NRC audit teams conducted additional comprehensive audits focused on the area of Y2K contingency planning at the following six sites:

Diablo Canyon 1 & 2	Duane Arnold
Indian Point 2	Oconee 1, 2, & 3
Palo Verde 1, 2, & 3	Turkey Point 3 & 4

The auditors reviewed internal facility risks, external risks, individual component/system contingency planning, and integrated contingency planning against industry guidelines of NEI/NUSMG 98-07, “Nuclear Utility Year 2000 Readiness Contingency Planning.” As indicated in our audit reports, all six of these plants are acceptably implementing the staff-approved industry guidelines.

In addition to the NRC staff activities previously mentioned, regional NRC inspectors reviewed plant-specific Y2K program implementation and contingency activities at all nuclear power plant facilities. The inspectors used guidance (Temporary Instruction [TI] 2515/141) prepared by the NRC headquarters staff that conducted the 12 sample audits and the 6 contingency planning audits. On the basis of the reviews, the staff found that licensees were implementing Y2K programs in accordance with staff-approved industry guidelines.

In September 1999, the NRC issued NUREG-1706, “Year 2000 Readiness in U.S. Nuclear Power Plants,” to present the results of the NRC-conducted onsite reviews of licensee Y2K programs at the 103 nuclear power plants, additional staff assessment of followup reviews of 14 plants, and updated information relating to plant-specific reviews.

After receipt of the July readiness reports and schedules the NRC monitored progress at those plants that still had remaining work to be performed so as to provide independent verification of the completion of remaining items, including Y2K contingency plans that specify procedures for dealing with unexpected events. As stated in NRC Press Release No. 99-168, the staff developed guidance for appropriate regulatory actions to be taken for those facilities that were not Y2K ready by July 1, 1999. As stated in a later press release (No. 99-207) dated September 28, 1999, the NRC sent letters to those utilities with nuclear power plants that were scheduled to be Y2K ready after September 30, 1999, to verify the status of readiness and the dates when plants will be fully Y2K ready. (As noted above, all of these plants are now Y2K ready.)

Since September 1998, the staff has provided periodic status reports to the Commission and the public (via the NRC website) describing its efforts in this area and the progress of nuclear power plant licensees on addressing the Y2K issue.

NRC will continue to oversee the Y2K issue relating to nuclear power plants for the rest of this year and beyond. We believe that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and beyond, and we do not believe that significant plant-specific action directed by the NRC to address possible Y2K problems is likely to be needed. The NRC remains committed to its oversight of the nuclear power plant licensee Y2K readiness efforts in order to ensure safe operation of these facilities.

Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

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S-99-24

Press Conference on Y2K Issues

Statement by

The Honorable Greta Joy Dicus

Chairman

U.S. Nuclear Regulatory Commission

National Press Club

August 3, 1999

Good Morning.

I am pleased to be here today on behalf of the Nuclear Regulatory Commission to discuss with you our understanding of the Year 2000 readiness of the U.S. nuclear industry and the agency's internal Year 2000 readiness preparations.

I have favorable news to report. Based upon our review of the responses from the nuclear power industry concerning Year 2000 readiness, our independent inspection efforts at all 103 operating units, and our ongoing regulatory oversight activities, we have concluded that the Year 2000 problem will not adversely affect the continued safe operation, or if necessary, the safe shut down of commercial nuclear power plants. We have reached this conclusion after many months of intense effort. Starting as early as December 1996, we began to engage our industry stakeholders on the development of guidance to deal with the Year 2000 problem. We endorsed these industry guidelines with the understanding that audits and inspections of our licensees' programs would enable us to assess independently the effectiveness of Year 2000 readiness at each nuclear power plant.

Regarding our highest priority-the uninterrupted performance of plant safety systems-all nuclear power plants report that their efforts are complete, and that no remaining Y2K-related problems exist that could directly affect the performance of safety systems or the capability for safe shutdown. While some plants have additional work remaining on systems not affecting reactor safety, the entire industry is on target to complete the necessary modifications to all administrative, monitoring, and power-related systems prior to January 1, 2000. Our audits, inspection reviews, and other oversight activities have not identified any issues that would preclude licensees from achieving Year 2000 readiness. We will continue to monitor nuclear power plant readiness as Year 2000 approaches.

NRC internal Year 2000 readiness is also complete. As of February 5, 1999, all of NRC's systems have been examined and, as needed, fixed or replaced with regard to the Year 2000 problem. In addition, in the unlikely event that Year 2000 problems affect one or more of our licensees, we have instituted an Agency Contingency Plan that provides for, among other things, around-the-clock staffing of our Emergency Operations Center.

The NRC remains committed to keeping our stakeholders and the general public informed. We have posted our generic communications, audits, and reports on our external Internet web site for access by members of the public.

In conclusion, we have been active in addressing the Year 2000 problem both internally and with our licensees. We will continue to work, both nationally and internationally, to promote awareness and provide assistance in addressing nuclear safety issues related to the Year 2000 computer problem. I would be happy to answer any question you may have at this time.

Nuclear Regulatory Commission

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S-99-23

Opening Remarks

by

The Honorable Greta Joy Dicus

Chairman

U. S. Nuclear Regulatory Commission

at

The NRC Y2K Training and Tabletop Exercise

Doubletree Hotel

Rockville, MD

July 14, 1999

Good morning, and welcome to the NRC Y2K training and tabletop exercise. I would like to welcome our partners from Calvert, Dorchester, and St. Mary's counties; our State of Maryland partners; our Federal partners from FEMA and the National Communications System; and Baltimore Gas & Electric Company. The utilities, the Federal government, the States, and the local governments have all developed emergency plans and procedures-which are regularly reinforced through training and exercises-to ensure that we are skilled at working together when responding to unforeseen occurrences.

The Y2K problem, or "millennium bug," as it is sometimes called, is not an unforeseen event. It is a known phenomenon that will happen at a precise time. The NRC, the industry, and others have been and are continuing to pursue a comprehensive program for dealing with potential Y2K problems in the nuclear industry. We have been working closely with all of our licensees, including our medical licensees, radiopharmaceutical manufacturers, irradiators, fuel cycle facilities, and commercial nuclear power plants. Let me briefly summarize the steps that have been taken to ensure that our nuclear power plant licensees are prepared for the Y2K transition.

Since 1996, the NRC has been working with nuclear power plant licensees and the Nuclear Energy Institute, an industry organization -- to ensure that plants are "Y2K ready" before the year 2000. In May 1998, the NRC sent a letter to all utilities requiring a response by July 1, 1999, confirming Y2K readiness or a status and schedule for remaining work if readiness cannot be achieved by then. Licensees

were also required by this letter to submit Y2K contingency plans.

The current status is as follows. The NRC has received reports from all 103 operating nuclear power plants. Regarding our highest priority-the uninterrupted performance of plant safety systems-all nuclear power plants report that their efforts are complete, that there are no remaining Y2K-related problems that could directly affect the performance of safety systems, or the ability of the plant to shut down safely if needed. Sixty-eight of these plants have also completed the next order of priority, stating that all of their computer systems that support plant operation are "Y2K ready." The remaining 35 plants have reported that, to be fully Y2K ready, they still have additional work to complete on a few non-safety computer systems or devices. For about one third of those 35 plants, some work remains on systems needed for power generation. Other plants must perform remediation on plant monitoring and administrative systems. Typically, the remaining Y2K work is waiting on a scheduled plant outage in the fall, or delayed while awaiting the delivery of a replacement component. In each case, the licensees with work remaining have provided their schedules for completing that work.

The NRC has also conducted independent reviews of Y2K programs at all operating nuclear power plants. The results of these reviews all indicate that licensees have taken the proper steps to identify and remediate digital systems that could be affected by the millennium bug. We will closely monitor the progress of plants that still have some systems left to remediate, but we fully expect that all commercial nuclear power plants will operate safely, as planned and without interruption, through the Y2K transition. Having said that, we still need to be prepared for the possibility that one or more plants may be affected, either directly or indirectly, by a Y2K problem.

What makes the Y2K problem unique is that it has the potential to impact many infrastructures, including those that we've traditionally relied upon for responding to an emergency. Albert Einstein said that "the only reason for time is so that everything doesn't happen at once." This particular technological snafu, however, will happen all at once. It is for this reason that we have developed our Y2K contingency plans.

Today we are here to learn about each other-how we each have prepared, what contingency or back-up plans we have put in place in case of unexpected failures, and how those plans can complement and supplement each other if we find ourselves responding to an unforeseen event. First, we will learn how each group is planning for potential Y2K problems, and then we will exercise those plans in a tabletop format. The prospect that an undetected or uncorrected Y2K problem, however unlikely, could cause a safety concern at a plant, coincident with the unavailability of systems that would ordinarily be relied upon for an emergency, is a concern that we all share. This training and tabletop exercise is intended to test the plans developed by the various partners for this unique situation, to ensure that they are coordinated and consistent. The generic lessons learned from this tabletop will be posted on our Y2K web site so that they may be shared with other States, utilities, and local governments. The NRC also hopes to use this tabletop exercise as an opportunity to identify any omissions or weaknesses in its own Y2K contingency plan and implementing procedures.

I would like to leave you with a slightly different perspective on the Y2K situation. I'm sure that all of you who have been intimately involved with this issue, have found it to be a challenge. But it is also an opportunity. On the Federal level, as FEMA will testify, the coordination and cooperation between Federal agencies on the Y2K issue are a foundation upon which the Federal government is building for future cooperative efforts. Much of the effort being spent on the Y2K problem will help Federal agencies better respond to emerging unconventional threats to the United States, such as terrorist acts. For

example, the National Communication System, in partnership with the telecommunications industry, has established a telecommunications network used for communicating national security and emergency preparedness information that is independent of the public telephone network. Although the Y2K problem was the impetus for developing this network, it will become permanent following the Y2K transition. The President's Council on the Y2K Conversion also has established a command center that will collect and disseminate information during the Y2K transition. After the Y2K transition, this center will be turned over to the Critical Infrastructure Assurance Office to support our national response to emergent threats. NRC is purchasing satellite phones for all of our nuclear power plant sites as part of our Y2K contingency plan, and many utilities are also investing in upgraded communication systems. As a result, if a tornado were to destroy the commercial telephone lines into a site as well as our own direct access lines, as it did last summer at Davis Besse, we will still be assured of communications with the site. These are just a few examples of how the Y2K effort will pay off long after we stand down from staffing our operation centers on New Year's Day.

I would like to again express my appreciation to all of you for your participation today, and for the substantial efforts you have continued to put forth to ensure that, like other parts of our nation's infrastructure, nuclear power plants will operate safely and without interruption or disturbance through the Y2K transition. Through our joint efforts, we truly will be protecting public health and safety and public interests.

I hope that each of you finds our session today to be a meaningful addition to your preparations to date.

Thank you.

Statement Submitted by the United States Nuclear Regulatory Commission to the Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety Committee on Environment and Public Works United States Senate

Presented by

William D. Travers
Executive Director for Operations

February 24, 1999

Introduction

Mr. Chairman, members of the Committee, I am pleased to be here today on behalf of the Commission to discuss with you the status of the U.S. Nuclear Regulatory Commission (NRC) response to the potential Year 2000 computer problem, particularly as it pertains to nuclear power plants. Our efforts can be divided into three basic areas: our actions internal to the NRC, our interactions with our licensees and the nuclear power industry, and our broader interactions, both nationally and internationally.

All 88 of NRC's mission-critical, business essential and non-critical systems have been examined and as needed, fixed with regard to the Year 2000 problem. In all, a total of 42 of 103 operating nuclear power plant units were associated with the Y2K readiness program audits of 12 utility licensees. Based on the results of these audits, we have concluded that the audited licensees are effectively addressing the Y2K problem and are taking the actions necessary to achieve Y2K readiness per the Generic Letter 98-01 target date. Further, the audits have verified that the NEI/NUSMG guidance is sufficient. We have not identified any issues that would preclude licensees from achieving Y2K readiness. Finally, we are actively involved in promoting awareness of the Year 2000 problem internationally.

Actions Internal to the NRC

I am pleased to tell you that as of February 5, 1999, all 88 of NRC's mission-critical, business-essential and non-critical systems have been examined and, as needed, fixed with regard to the Year 2000 (Y2K) problem. This work was accomplished more than a month ahead of OMB's established milestone and well under budget.

As part of this effort, we analyzed and identified embedded chip systems at the NRC and made necessary upgrades or replacements to make them Y2K compliant. Also, we worked with our data exchange partners and repaired, validated, and implemented those systems requiring changes.

All work necessary to ensure that 100 percent of our telecommunications infrastructure is compliant or not affected by Year 2000 issues has been completed. Our telecommunications service providers have

been contacted to determine their plans to achieve Year 2000 compliance. All have responded that they are compliant or will be compliant by mid-1999. The one (NRC) mission-critical system that is directly linked to operating nuclear power plants is our Emergency Response Data System (ERDS). This application performs the communication and data transmission functions that provide near real-time data to NRC incident response personnel during declared emergencies. We have verified that this system has been made Y2K compliant and that the interface of the system with licensed facilities is functional.

NRC Actions With Licensees

Since 1996, the NRC has been working with nuclear industry organizations and licensees to address the Y2K problem. To ensure that senior level management at operating U.S. nuclear facilities was aware of the Y2K problem, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. The Notice 96-70 described the potential problems that nuclear facility computer systems and software might encounter during the transition to the new century. All U.S. nuclear power plants, fuel cycle facilities, and other material licensees were provided with copies of this document.

In 1997, the Nuclear Energy Institute (NEI) agreed to take the lead in developing industry-wide guidance for addressing the Y2K problem at nuclear power reactors. In November 1997, NEI issued a guidance document to all U.S. nuclear power plant licensees, entitled "Nuclear Utility Year 2000 Readiness" (NEI/NUSMG 97-07).

In Generic Letter 98-01, issued May 11, 1998, the NRC accepted the NEI/NUSMG 97-07 guidance as an appropriate program for nuclear power plant Year 2000 readiness and requested that all operating U.S. nuclear power plant licensees submit written responses regarding their facility-specific Y2K readiness programs in order to obtain confirmation that licensees are addressing the Y2K problem effectively. Thus far, all licensees have responded to GL 98-01 stating that they have adopted plant-specific programs, similar to that outlined in the NEI/NUSMG 97-07 guidance document, that are intended to make the plants Y2K ready by July 1, 1999.

Similarly, Generic Letter 98-03 was sent to fuel cycle licensees and certificate holders requesting written confirmation of implementation of their Year 2000 Readiness Program. Further, facilities were requested to provide written confirmation that the facilities are Y2K ready and in compliance with the terms and conditions of their license/certificate and NRC regulations. All facilities have confirmed implementation of their Year 2000 Readiness Program. All facilities are scheduled to be Y2K ready in October 1999.

Generic Letter 98-01 also requests a written response, no later than July 1, 1999, confirming that these facilities are Y2K ready. Licensees who are not Y2K ready by July 1, 1999, must provide a schedule for remaining work to ensure timely Y2K readiness. The NRC will assess these responses and, by September 30, 1999, determine the need for further plant-specific regulatory actions. Should the NRC identify a situation where the Y2K problem results in a licensee being in noncompliance with the plant license or NRC regulations, appropriate regulatory action (e.g. a shutdown order) will be taken as necessary.

Based on the results of our audits (as discussed below), licensee management oversight of the Y2K readiness programs has generally been aggressive and is contributing to the success of nuclear power plant Y2K readiness efforts. Licensees are devoting the necessary resources to their programs to meet their readiness schedules. At a recent February 11, 1999 Commission meeting on the Year 2000 issue, the Nuclear Energy Institute (NEI) informed the Commission that all 66 power reactor sites will carry out

an audit of their Year 2000 readiness activities. Specifically, NEI stated that 54 sites have completed internal Year 2000 quality assurance audits, 33 sites have completed cross utility audits, and 43 sites have completed third party audits. Moreover, the continued sharing of work and information through owners groups and utility alliances is aiding in proper Y2K readiness program implementation.

As with other aspects of plant operation, we provide independent oversight and respond when appropriate to ensure adequate protection of public health and safety. Our oversight processes rely on the recognized ability of our licensees to complete critical self-assessments and initiate appropriate corrective actions. Notwithstanding the comprehensive industry Y2K efforts, we have recognized the importance of providing an appropriate level of NRC oversight of Y2K preparations at nuclear power plants.

NRC resident inspectors who are assigned to all power reactor sites will carry out reviews of licensee Y2K readiness activities. In addition, since last September, the NRC staff has conducted 12 planned sample audits of nuclear power plant licensee Y2K programs. These audits were completed in January 1999. The results of these audits have been documented in NRC-issued audit reports which are available on the NRC website and have been discussed at industry workshops. We also plan to communicate a summary of our observations and lessons learned through the issuance of an information notice.

The NRC staff selected a variety of types of plants of different ages, vendor design, and locations in this audit sample in order to obtain the necessary assurance that nuclear power industry Y2K readiness programs are being effectively implemented and that licensees are on schedule to meet the readiness target date of July 1, 1999, established in Generic Letter 98-01. The licensee sample audits included large utilities such as Commonwealth Edison and Tennessee Valley Authority as well as small, single reactor licensees such as North Atlantic Energy (Seabrook) and Wolf Creek Nuclear Operating Corporation.

These findings are consistent with those recently reported by the Department of Energy in the January 11, 1999, report prepared by the North American Electric Reliability Council on the status of Y2K readiness of the electric power grid.

To date, the NRC staff has not identified or been apprised of any Y2K problems in nuclear power plant systems that directly impact actuation of safety functions. The majority of commercial nuclear power plants have protection systems that are analog rather than digital or software-based and thus not impacted by the Y2K problem. Errors such as incorrect dates in print-outs, logs or displays have been identified by licensees in some safety-related devices, but the errors do not affect the safety functions performed by the devices or systems. Most Y2K problems are in non- safety systems such as security systems and plant monitoring systems which support day-to-day plant operation but have no functions necessary for reactor safety. In addition, through site visits and surveys NRC continues to monitor the security systems at reactors and does not expect any Y2K problems following licensee actions in this area. These systems are being addressed in the licensee Y2K readiness programs consistent with the industry guidance and the GL 98-01 schedule.

In NRC Generic Letter 98-01, it was also noted that despite the best of efforts to achieve Y2K readiness, unanticipated problems (particularly events external to a plant) could occur and disrupt continued plant operation. Therefore, contingency plans are needed to address potential unanticipated Y2K problems. To address this need, in August 1998 NEI issued another guidance document, "Nuclear Utility Year 2000 Readiness Contingency Planning," (NEI/NUSMG 98-07) which is being incorporated into Y2K readiness programs by all U.S. nuclear power plant licensees. These detailed plant- specific Y2K

contingency plans also are scheduled to be completed by July 1, 1999.

As a result of the 12 sample audits, we have concluded that, in general, licensees began to develop contingency plans late in the Y2K preparation process. As a consequence, we have decided to conduct six additional, differently focused reviews, involving licensees other than those that comprised the original 12, to determine the effectiveness of industry contingency planning guidance. We will begin these reviews in April 1999 and conclude them in June 1999. These reviews will focus on the licensees' approach to addressing both internal and external Y2K risks to safe plant operations based on the guidance in NEI/NUSMG 98- 07. Resident inspectors at all power reactor sites will also carry out reviews of licensee's contingency plans.

NRC has conducted one Y2K inspection at each of the ten major fuel facilities. The inspections determined that all facilities are adequately addressing Year 2000 issues and will be Year 2000 Ready by December 31, 1999. The Y2K readiness program implemented by each fuel facility is intended to identify and repair software, hardware, and embedded systems that could degrade, impair, or prevent operability of the facility.

Broader National Focus

Although the primary focus of the NRC with our licensees has been on public health and safety, related to reactor operations, we recognize the concern that the Year 2000 problem could affect the reliability of electrical grids. Our regulatory focus on electrical grid reliability has related primarily to the challenges to plant safety systems that might result from a grid transient, such as a loss of offsite power.

However, the Y2K problem has presented the NRC with a unique challenge because NRC regulatory oversight and authority does not extend to the U.S. offsite electrical grid system. Nonetheless, we recognize the national importance of a broader focus that helps to ensure that potential concerns with electrical grid reliability are identified and resolved. The NRC supports the efforts of the President's Council on Year 2000 Conversion. As members of the Energy/Electric Power Sector Working Group, we understand the importance not only of maintaining nuclear power plant safety, but of enhancing safe grid operation in the face of the Y2K problem as well.

With respect to electric power distribution, in May 1998, the U.S. Secretary of Energy requested that the North American Electric Reliability Council (NERC) coordinate efforts within the electric power industry to assure a smooth Year 2000 transition. The NERC is a voluntary industry reliability group, made up of 10 regional councils, whose membership includes nearly every major provider of electricity generation and transmission within the Eastern, Western, and Texas interconnections that form the backbone of the electricity supply system for the United States, Canada, and a small portion of Mexico.

The NERC has established recommended industry-wide milestones for ensuring that U.S. electric systems are ready for the Year 2000. The recommended completion date for the remediation/testing phase of Y2K preparations is May 1999. Mission-critical systems and components (e.g., power production, energy management systems, telecommunications, substation controls and system protection, and distribution systems) are to be made Y2K ready by June 30, 1999.

The NERC has worked in partnership with trade associations representing investor-owned utilities (Edison Electric Institute), municipal utilities (American Public Power Association), rural electric cooperatives (National Rural Electric Cooperatives Association), nuclear power plant operators (Nuclear

Energy Institute), and the Canadian electric power industry (Canadian Electricity Association) to ensure the most complete coverage of the industry in the surveys and assessments of Y2K readiness.

The U.S. electric power industry is placing considerable emphasis on contingency planning for the Year 2000 transition. The NERC is targeting June 1999 for completion of contingency plans.

The NRC also is developing a Y2K contingency plan to enable us to respond rapidly to potential events at licensed U.S. facilities resulting from unanticipated Y2K problems. The draft plan includes provisions to collect and disseminate information on Y2K-related events that occur in countries in time zones ahead of the U.S. Continued safe operation of nuclear power plants during the transition to the Year 2000 is important to help maintain reliable electrical power supplies. As such, the draft NRC Y2K contingency plan includes considerations for rapid decision-making under circumstances where a Y2K problem might result in licensee non-compliance, but would not affect continued safe plant operation. The draft NRC Y2K contingency plan is being coordinated with the U.S. nuclear power industry, other Federal agencies (including the Federal Emergency Management Agency), State governments, and international nuclear regulatory organizations. The public comment on the draft Y2K contingency plan recently concluded and the final plan is scheduled to be forwarded to the Commission in April.

In early October the NRC plans to conduct a "Y2K Exercise." In this dry run we will attempt to ensure that all aspects of our Y2K contingency plan are in place. Regulators from Taiwan, Japan, Finland, Sweden and the United Kingdom have all expressed an interest in participating in this exercise. We also hope to have participation from several of our licensees.

We consider public awareness a vital aspect of our Y2K program and have kept the public informed about our Y2K activities through numerous media releases, responses to questions by telephone, electronic mail, and letters, interviews with reporters, participation at workshops, public meetings, and maintenance of current Y2K information on our Web site.

International Activities

We are actively involved in promoting awareness of the Year 2000 readiness issues internationally. In preparation for the 42nd IAEA General Conference in September 1998, the NRC took the lead in drafting a resolution on the Year 2000 (Y2K) readiness for the safety of nuclear power plants, fuel cycle facilities, and other enterprises using radioactive materials. That resolution urged, among other things, that: Member States submit information to the IAEA on activities underway to inventory and remediate Y2K problems at their nuclear facilities; and that the IAEA act as a central coordination point in disseminating information about Member State Y2K activities.

During its numerous bilateral side meetings with countries such as Argentina, Lithuania, Russia and Ukraine, the NRC presented the draft resolution and urged their support. Ultimately, 28 Member States co-sponsored the resolution, including a number of countries that have nuclear facilities whose safety are of particular concern to the U.S. government.

Since the General Conference, the NRC likewise has worked with the IAEA to formulate a Y2K program that would address nuclear safety aspects of the Y2K problem. We requested that State Department funds be allocated, under the FY98 Voluntary Contribution, to fund a Cost-Free Expert (an individual who would work at the IAEA for one year at no cost to the IAEA) to work specifically on Y2K nuclear safety matters in the Department of Nuclear Safety. The Cost-Free Expert assumed his post in December 1998,

and the Department of Nuclear Safety is now developing and implementing a comprehensive program to help Member States address Y2K remediation issues and contingency planning.

In the international arena, our understanding is that the nuclear power industry and its regulators in Canada, Western Europe, and the Far East have undertaken similar efforts and readiness schedules to that of the NRC for addressing the Y2K problem at nuclear power plants. However, some countries have started only recently to focus on the Y2K problem. Last month, at a meeting of the International Nuclear Regulators Association (INRA), which is Chaired by NRC Chairman, Dr. Shirley Ann Jackson, a statement was drafted on the Y2K problem, expressing concern that the results of the recent United Nations Conference indicated that few countries will be Y2K ready, and that few have adopted expert guidance regarding remediation and contingency planning. Contingency planning, while important in itself to all countries, takes on new importance in late-starting countries, due to the short time remaining before the year 2000. In its statement, which was transmitted to appropriate agencies in INRA member governments, to the Nuclear Energy Agency of the Organization for Economic Cooperation and Development, to the International Atomic Energy Agency, and to the Chairman of the first Review Meeting of the Convention on Nuclear Safety for use in the peer review process, the INRA urged governments and their regulatory authorities to take urgent action to diagnose the extent of the Y2K problem in nuclear facilities (including nuclear power plants, fuel cycle facilities, and medical facilities), and to formulate and implement effective remediation programs and contingency planning in the near term for this pre- eminent concern. This remains a key aspect to effective Y2K readiness.

Summary

As discussed above, we have been proactive in addressing the Year 2000 problem internal to the NRC and with our licensees. Additionally, we continue to work, both nationally and internationally, to promote awareness and provide assistance in addressing the Year 2000 problem. Ensuring continuity at the interfaces of regulator-to- licensee, regulator-to-public, and regulator-to- government is crucial. It is the recognition that, despite industry efforts and our efforts, something still could go awry that will continue to drive our Y2K readiness efforts.

With that said, it is of paramount importance to note that the NRC and the nuclear power industry are addressing the Year 2000 computer problem in a comprehensive, thorough and deliberate manner. To date, we have not identified or received notification from licensees or vendors that a Year 2000 problem exists with safety-related initiation and actuation systems. Further, we believe that we have--through Generic Letter 98-01, the sample audits and other oversight activities- -established a framework that appropriately assures that the Year 2000 problem will not have an adverse impact on the ability of a nuclear power plant to safely operate or safely shut down.

We look forward to working with the Subcommittee and welcome your questions.

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"Exterminating the Bug:

Governmental and Industrial Challenges in the Face of the Year 2000 Problem"

by

Dr. Shirley Ann Jackson, Chairman

U.S. Nuclear Regulatory Commission

OECD/NEA Committee on Nuclear Regulatory Activities

International Workshop on the Impact of the Year 2000 on the Nuclear Industry

Ottawa, Canada, February 9, 1999

Introduction

Good evening, ladies and gentlemen. First and foremost I would like to thank our host, the Atomic Energy Control Board (AECB), and our sponsor, the Organization for Economic Cooperation and Development/Nuclear Energy Agency (OECD/NEA), for organizing and conducting this workshop. Ottawa is a lovely city-a bit cold this time of the year-but very lovely.

The world has come to rely on computers in its day-to-day operations, and people have accepted computers as part of everyday life. We have built a web of interconnected computer systems on which we rely for virtually every need, including energy, communication, transportation, and banking, among others, making our world increasingly interconnected and interdependent. There also is a reliance, however unrealized, on embedded systems that include chips and firmware, which are in virtually every electronic appliance we use at home. These computers and embedded chips also are found in electrical transmission and distribution systems, communication systems, and equipment and components in electrical generating stations, including nuclear power stations. Just after the stroke of midnight on December 31, 1999, these systems have the potential to fail.

Particular concerns within the U.S. electric power industry include the reliability of voice and data communications needed for monitoring and control of power systems, and the use of embedded chips in communications and numerous power system device controllers. While it is estimated that only 1 to 2 percent of these devices uses a time/date function in a manner that could result in a Y2K malfunction, the interconnected nature of electric systems make them sensitive to the failure of any equipment.

As you know, the Year 2000 (Y2K) problem concerns the use of a two-digit year element, usually within a six-digit date representation (MM/DD/YY or variations), with the twentieth century not explicitly stated but implied. Many of the computer-based systems we depend upon could experience operational difficulties at the turn of the century due to their inability to recognize and accommodate the change from the year 1999 to the year 2000. The degree to which such difficulties impact society is a function of the type of component experiencing the problem, the degree to which the problem impacts the component, and the nature and number of interrelationships between the affected component and other components and systems.

The Y2K problem is not without solutions. Businesses and governments know how to fix non-compliant systems, and are devoting significant financial and human resources toward doing so. Identifying, categorizing, repairing, or replacing systems, components, and equipment and their interconnections takes time, however, and January 1, 2000, is an immovable deadline. Ensuring that critical systems and equipment are ready for the Year 2000 is a matter of prioritizing what needs to be fixed, devoting adequate human and financial resources to the project, and developing contingency plans to be used in the event that systems, either internal or external, fail.

Electrical Grid Instability and Loss of Offsite Power

The Y2K problem has significant implications for the management of electrical distribution networks (grids). Individual susceptibilities may exist in software controlling a particular portion of the grid itself or telecommunications systems supporting grid management. Moving downward to the electrical generation level, Y2K problems can affect individual components involved in the production of electricity, such as digital process controllers. When one considers a nuclear power plant, a concern exists that not only power generation problems may arise, but that problems may extend to the safety systems of a facility and create challenges to these systems.

When one considers the myriad of possible situations in which the Y2K problem can manifest itself, it soon becomes obvious why the issue demands our prompt attention. In an admittedly pessimistic scenario, what starts as a Y2K-related electrical grid instability, for a particular nuclear plant, could cascade into a loss of offsite power which, in turn, would challenge plant safety systems. Can such a cascade occur? In 1996, two electrical disturbances (within a five-week period) on the Western U.S. Grid caused 190 plants to trip off-line, including several nuclear units. In particular, on July 2, 1996, a transmission line sagged into a tree in Idaho, creating a ground fault which progressed into a major fault on the Western Interconnection. The affected nuclear plants saw a frequency transient, but did not scram or lose offsite power. A similar event occurred the next day but did not propagate outside Idaho. On August 10, 1996, again a line sagged into a tree, this time in Oregon. The subsequent transient resulted in the loss of over 30,000 MW(e) of load, 25,000 MW(e) of generation, which is 17 percent of the total western U.S.-Canada generation. Among the 190 generating units that tripped were 4 nuclear units at Diablo Canyon in California and Palo Verde in Arizona.

Why are these events significant? Let me explain. First, such cascading transients, in causing reactor scrams, can challenge plant safety systems directly. Second, they can lead to Station Blackout events. In 1988, the NRC initiated Individual Plant Examinations to study the various initiators of reactor core damage events. All U.S. nuclear plants performed probabilistic risk assessments, with detailed modeling of their plant systems, to search for plant-specific vulnerabilities from severe accidents. At many of the nuclear plants these studies showed that a major contributor to core damage frequency was a Station

Blackout event. Events of this type are defined as Loss-of-Offsite-Power events, coupled with the inability of the onsite emergency diesel generators to provide power to key plant safety equipment. If a cascading transient brought down multiple generating units at a time that onsite power sources did not exist, or were compromised, a nuclear plant could experience a Station Blackout event.

Depending upon the degree of Y2K readiness in safety systems, the result of a Loss of Offsite Power or Station Blackout could range from an analyzed, expected, plant response to a more significant event. Moreover, if emergency response is required offsite, the degree to which the telecommunications infrastructure is Y2K compliant would dictate the effectiveness of that response. To be sure, we at the NRC do not deem such an outbreak of failures to be probable based upon what we currently know about Y2K. Rather, it is the *possibility* of such events that motivates our actions.

Tonight, I would like to discuss the activities the United States is undertaking with respect to the Y2K issue, both domestically and internationally; the actions the Nuclear Regulatory Commission (NRC) is taking, both internally and externally; and some of the factors that are driving these activities.

U.S. Government Activity

The importance of addressing the Y2K problem in the U.S. was acknowledged by President Clinton early last year when he established the President's Council on Year 2000 Conversion on February 4, 1998. The Council is made up of representatives from more than 30 major U.S. Federal executive and regulatory agencies, including the U.S. Nuclear Regulatory Commission. The Council Chair is Mr. John Koskinen, Assistant to the President for Year 2000 Conversion. Each agency on the U.S. Council is responsible for oversight of the Y2K efforts necessary for ensuring availability of the infrastructure sector for which they have statutory responsibility. These "sector coordinators" promote action on the Y2K problem and offer support to public and private sector organizations-both domestically and internationally-within their policy areas. In particular, agencies are working with industry trade associations (which have unique capabilities for communicating with their members about the Y2K problem); individual companies; and U.S. State and local governments. The nine major sector areas covering the provision of critical services are: benefits/payments, communications, electrical power, emergency services, financial services, oil and gas, solid waste, transportation, and water supply.

On January 7, 1999, the U.S. Council issued its first quarterly report, which summarizes information about the level of preparedness among key industries as follows:

- Virtually all of the industry areas report high awareness of the problem and its potential consequences.
- Participants in several areas are mounting aggressive efforts to combat the Y2K problem, and to ensure that critical systems will be able to process the date change to the Year 2000. Financial institutions, including banks and securities firms, are most notable for their coordination and progress.
- We increasingly are confident that there will not be large-scale disruptions among banks, and in the power and telecommunications industries. Disruptions that do occur most likely will be of a more localized nature.
- Large organizations often have a better grasp on the problem than some of their smaller counterparts. While many small and medium-sized U.S. businesses and government organizations are focused on solving the Y2K problem and have made significant progress, some continue to

believe the problem will not affect them or are delaying action until failures occur. Lack of preparedness among these organizations increases the risk for localized Y2K disruptions.

At the Federal level, U.S. agencies are working to prepare mission-critical systems for the Year 2000, and have mounted aggressive efforts to ensure that critical services will not be disrupted by the transition to the new millennium. Agencies are working to develop contingency plans in the event of internal or external Y2K related failures.

To help companies, associations, and other groups collect and share information on the status of Y2K efforts, the President worked with the Congress to enact the "Year 2000 Information and Readiness Disclosure Act." On Oct. 19, 1998, President Clinton signed this act into law and stated: "The Y2K problem is an enormous challenge, and we must meet it. Enactment of this legislation is a significant achievement toward allowing all of us to take a successful step into the new millennium." This Act placed limits on financial liability for entities that disclose Y2K readiness information, thereby encouraging U.S. companies to share information about fixing computers and systems at risk because of the Year 2000 date problem.

With respect to electric power distribution, in May 1998, the U.S. Secretary of Energy requested that the North American Electric Reliability Council (NERC) coordinate efforts within the electric power industry to assure a smooth Year 2000 transition. The NERC is a voluntary industry reliability group, made up of 10 regional councils, whose membership includes nearly every major provider of electricity generation and transmission within the Eastern, Western, and Texas interconnections that form the backbone of the electricity supply system for the United States, Canada, and a small portion of Mexico.

The NERC has established recommended industry-wide milestones for ensuring that U.S. electric systems are ready for the Year 2000. The recommended completion date for the remediation/testing phase of Y2K preparations is May 1999. Mission-critical systems and components (e.g., power production, energy management systems, telecommunications, substation controls and system protection, and distribution systems) are to be made Y2K ready by June 30, 1999.

The NERC has worked in partnership with trade associations representing investor-owned utilities (Edison Electric Institute), municipal utilities (American Public Power Association), rural electric cooperatives (National Rural Electric Cooperatives Association), nuclear power plant operators (Nuclear Energy Institute), and the Canadian electric power industry (Canadian Electricity Association) to ensure the most complete coverage of the industry in the surveys and assessments of Y2K readiness.

The U.S. electric power industry is placing considerable emphasis on contingency planning for the Year 2000 transition. The NERC is targeting June 1999 as the date for completion of contingency plans.

Activities of the U.S. Nuclear Regulatory Commission for Y2K Readiness

U.S. Nuclear Regulatory Commission (NRC) preparations, both internal and external, have been underway for some time.

Internal Preparations

Internally, the Year 2000 problem potentially affects the NRC in the areas of computer information systems hardware and software, embedded chip systems, data exchanges with outside entities, telecommunications hardware infrastructure, and building environmental, fire protection, security access,

and other control systems.

The NRC adopted a strategy, in accordance with best practices published by the Office of Management and Budget (OMB), and developed a schedule closely aligned to the milestone dates recommended by the OMB for assessment, renovation, validation, and implementation of remediation for key systems. The NRC made the decision to spend additional time on assessment so that the full scope of our remediation efforts were understood. Having an understanding of this scope enabled us to schedule resources more accurately to correct identified system problems within established schedules.

At the request of the OMB, all U.S. agencies were asked to identify their mission-critical systems. The NRC identified seven computer and telecommunications systems as having high importance related to accomplishing the NRC mission and requiring a high level of reliability, because any delay in access to the system for any reason could adversely affect the ability of the agency to fulfill its mission of protecting public health and safety, promoting the common defense and security, and protecting the environment.

The NRC grouped its remaining systems into two categories (business-essential and non-critical) in order to make explicit decisions about establishing their priority for repair. Business-essential systems are described as any system that is integral to agency processes and required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while being repaired. Non-critical systems are those that are not considered mission-critical or business-essential and whose unavailability would represent only an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired, and manual processes can be used readily in their place, if necessary.

Of the total number of systems identified as requiring review for Y2K vulnerabilities, the NRC ultimately identified 88 systems with Y2K problems that had to be addressed. Seven were mission-critical, 51 were business-essential, and 30 were non-critical.

Our testing or validation of system repairs has been very rigorous. Systems repaired by Year 2000 program contractors are being verified and validated independently, using a three-level approach. The first level, unit testing, is performed by personnel who actually repair the system code. The second and third levels are performed by personnel who are not involved with system repairs. The second level of testing is performed by personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing is performed by the NRC personnel who use the system, also using an established test plan. Only when written approval is received from all three testing levels do we consider the system validated and report it as such.

We also have analyzed and identified embedded chip systems at the NRC. Forward date testing of embedded chip systems can be problematic, since access to embedded chip system control programs is limited. As a result, both the nuclear power industry and the NRC rely on manufacturer certification to establish compliance and, where possible and appropriate, on in-house testing to confirm compliance. We have tested our microcomputers successfully with available testing software to determine compliance.

Additionally, the NRC has assessed all areas of the agency that have the potential to exchange data with other Federal, State, and local governments, as well as with international and commercial entities. We

have assessed satisfactorily all agency building systems and our telecommunications infrastructure, and also have contacted our telecommunications service providers to ensure that all systems are compliant or will be compliant by mid-1999.

Our strategy required our business experts to prepare contingency plans in case we were unable to complete repairs in time, or in case factors outside our control (electricity, etc.) rendered the systems unusable. Our contingency plans are commensurate with the nature of our mission-critical systems. In all but one case (our administrative local area network), assuming total automation unavailability, we have an option of reverting to manual methods to continue support of the mission-critical functional area. These manual methods have been used successfully by our business offices in the past when their systems did not exist or were unavailable temporarily.

I am pleased to tell you today that, as of February 5 (54 days ahead of the OMB-established milestone), we have completed the renovation, validation, and implementation of all NRC mission-critical, business essential, and non-critical systems requiring repair.

In terms of program cost, I am pleased to report that our Y2K program was completed under budget. Since we have completed our program for all systems, $600,000 in resources budgeted for FY 2000 will not be needed, and we expect our actual expenditures for FY 1999 to be less than budgeted.

External Preparations

The NRC also is developing a Y2K contingency plan to enable us to respond rapidly to potential events at licensed U.S. facilities resulting from unanticipated Y2K problems. The plan includes provisions to collect and disseminate information on Y2K-related events that occur in countries in time zones ahead of the U.S. Continued safe operation of nuclear power plants during the transition to the Year 2000 is important to help maintain reliable electrical power supplies. As such, the NRC Y2K contingency plan includes considerations for rapid decision-making under circumstances where a Y2K problem might result in licensee non-compliance, but would not affect continued safe plant operation. The NRC contingency plan will be coordinated with the U.S. nuclear power industry, other Federal agencies (including the Federal Emergency Management Agency), State governments, and international nuclear regulatory organizations.

With respect to external activities, in 1996 the NRC began an evaluation of the impact of the Year 2000 problem (Y2K) on nuclear power plants. To ensure that senior level management at operating U.S. nuclear facilities was aware of the Y2K problem, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. IN 96-70 described the potential problems that nuclear facility computer systems and software might encounter during the transition to the new century. All U.S. nuclear power plants, fuel cycle facilities, and other material licensees were provided with copies of this document.

Since 1996, the NRC has been working with nuclear industry organizations to address the Y2K problem. In 1997, the Nuclear Energy Institute (NEI) agreed to take the lead in developing industry-wide guidance for addressing the Y2K problem at nuclear power reactors. In November 1997, NEI issued a guidance document to all U.S. nuclear power plant licensees, entitled "Nuclear Utility Year 2000 Readiness" (NEI/NUSMG 97-07).

In Generic Letter 98-01, issued May 11, 1998, the NRC requested that all operating U.S. nuclear power plant licensees submit written responses regarding their facility-specific Y2K readiness programs in

order to obtain confirmation that licensees are addressing the Y2K problem effectively. Thus far, all licensees have submitted an initial response stating that they have adopted plant-specific programs, similar to that outlined in the NEI guidance document to which I referred, that are intended to make the plants Y2K ready by July 1, 1999. Generic Letter 98-01 also requests a written response, no later than July 1, 1999, confirming that these facilities are Y2K ready. If not Y2K ready by the July deadline, these licensees also must include a status report for the work remaining, including completion schedules, to ensure timely Y2K readiness. Based on these responses, the NRC will determine the need for plant-specific follow-up actions.

In NRC Generic Letter 98-01, it was noted that despite the best of efforts to achieve Y2K readiness, unanticipated problems (particularly events external to a plant) could occur and disrupt continued plant operation. Therefore, contingency plans were needed to address potential unanticipated Y2K problems. To address this need, in August 1998 NEI issued another guidance document, "Nuclear Utility Year 2000 Readiness Contingency Planning," (NEI/NUSMG 98-07) which is being incorporated into Y2K readiness programs by all U.S. nuclear power plant licensees. The detailed plant-specific contingency plans also are scheduled to be completed by July 1, 1999.

Although the primary focus of the NRC with our licensees has been on public health and safety, related to reactor operations, we recognize the concern that the Year 2000 problem could affect the reliability of electrical grids. Our regulatory focus on electrical grid reliability has related primarily to the challenges to plant safety systems that might result from a grid transient, such as a Loss of Offsite Power.

However, the Y2K problem has presented the NRC with a unique challenge. NRC regulatory oversight and authority does not extend to the U.S. offsite electrical grid system. Nonetheless, we recognize the national importance of a broader focus that helps to ensure that potential concerns with electrical grid reliability are identified and resolved. As mentioned earlier, the NRC supports the efforts of the President's Council on Year 2000 Conversion. As members of the Energy/Electric Power Sector Working Group, we understand the importance not only of maintaining nuclear power plant safety, but of enhancing safe grid operation in the face of the Y2K problem as well.

In addition to the exchange of information between the NRC and power reactor licensees, we have recognized the importance of seeing, first-hand, how Y2K preparations are being pursued at the nuclear power plants. In 1998, the NRC began a series of audits at 12 power reactor licensees. The individual licensees were chosen to reflect a cross-section of ages, reactor types, locations, vendors, and utility sizes. From these audits, the NRC concluded that, by employing the NEI guidance I previously described, licensees could address the Y2K problem effectively. The audits also concluded that, in general, licensees began to develop contingency plans late in the Y2K preparation process. Consequently, the NRC concluded that six additional, differently focused reviews, involving licensees other than those that comprised the original 12, were in order to determine the effectiveness of licensee contingency planning. We will be performing these audits in the March/April time frame, focusing on this area.

International Activities

The President's Council stated, in its first quarterly report, that international failures are likely. Despite recent increased efforts, a number of countries have done little thus far to remediate critical systems. These failures could have a significant impact upon the U.S. and other countries, especially in areas that rely heavily upon cross-border operations. International Y2K activity is the area about which we have the

least information. The U.S. State Department and other agencies on the Council's International Relations Working Group have been working with U.S. embassies and other organizations around the world in an effort to gather Y2K information on a country-by-country basis.

The U.S. is working to encourage other nations to take action on the problem and to facilitate coordination of country Y2K efforts on a regional and international basis. We worked closely with the President's Council to support the United Nations meeting of national Y2K coordinators. Coordinators from over 120 countries attended the December 1998 meeting. Delegates to the meeting discussed Y2K challenges in key infrastructure areas and agreed to work together regionally to share information on their Y2K remediation and contingency planning. The U.S., along with several other nations that helped to organize the meeting, will work to create an international coordinating center to support these efforts in the coming months.

In preparation for the 42nd IAEA General Conference in September 1998, the NRC took the lead in drafting a resolution on the Year 2000 (Y2K) as it applies to the safety of nuclear power plants, fuel cycle facilities, and other enterprises using radioactive materials. That resolution urged, among other things, that: Member States submit information to the IAEA on activities underway to inventory and remediate Y2K problems at their nuclear facilities; and that the IAEA act as a central coordination point in disseminating information about Member State Y2K activities.

During its numerous bilateral side meetings with countries such as Argentina, Lithuania, Russia and Ukraine, the NRC presented the draft resolution and urged their support. Ultimately, 28 Member States co-sponsored the resolution, including a number of countries that have nuclear facilities whose safety are of great concern to the U.S. government.

Since the General Conference, the NRC likewise has worked with the IAEA to formulate a Y2K program that would address nuclear safety aspects of the Y2K problem. We requested that State Department funds be allocated, under the FY98 Voluntary Contribution, to fund a Cost-Free Expert (an individual who would work at the IAEA for one year at no cost to the IAEA) to work specifically on Y2K nuclear safety matters in the Department of Nuclear Safety. The Cost-Free Expert assumed his post in December 1998, and the Department of Nuclear Safety is now developing and implementing a comprehensive program to help Member States address Y2K inventories and contingency planning.

The U.S. also has forged bilateral cooperative agreements on the Y2K challenge with several nations, including Japan, South Korea, Canada, and Mexico. Under these agreements, U.S. authorities are working with their counterparts in other countries to exchange information on Y2K efforts in key areas such as power, transportation, customs, telecommunications, finance, and health care.

The U.S. Council Chair has met with numerous international organizations such as the Organization of American States, the OECD, the World Bank, and the International Monetary Fund to enlist their support in encouraging their members to take action on the Y2K problem. To assist developing countries, the U.S. is working with the World Bank to support its program of increasing awareness of the problem among developing countries through a series of international conferences.

In the international arena, my understanding is that the nuclear power industry and its regulators in Canada, Western Europe, and the Far East have undertaken similar efforts and readiness schedules to that of the NRC for addressing the Y2K problem at nuclear power plants. However, some countries have started only recently to focus on the Y2K problem. Last month, at a meeting of the International Nuclear

Regulators Association (INRA), which I chair, a statement was drafted on the Y2K problem, expressing concern that the results of the recent United Nations Conference indicated that few countries will be Y2K ready, and that few have adopted expert guidance regarding remediation and contingency planning. Contingency planning, while important in itself to all countries, takes on new importance in late-starting countries, due to the short time remaining before the year 2000. In its statement, the INRA urged governments and their regulatory authorities to take urgent action to diagnose the extent of the Y2K problem in nuclear facilities (including nuclear power plants, fuel cycle facilities, and medical facilities), and to formulate and implement effective remediation programs and contingency planning in the near term for this pre-eminent concern. I understand that contingency planning was the subject of discussion at a session here today. This is a key aspect to effective Y2K readiness.

There Are No Islands

We have come to recognize that nuclear power plants are not islands. The plants rely upon stable electrical distribution systems to support steady-state operations. Symbiotically, stable distribution systems rely on the collective output of generating facilities. In a very real sense then, we all are dependent on the stability of one another. An extension of this concept applies to emergency planning. The ability of both onsite personnel and civic responders to act will be tied directly to the state of Y2K preparedness in each of the participating organizations. In the same way that each generating plant on a grid can be affected by the other plants on the grid, the emergency response capabilities associated with one plant can be impacted in responding to other potential eventualities, such as events at neighboring plants or other Y2K-related emergencies outside of the electricity industry. For this reason, ensuring continuity at the interfaces of regulator-to-licensee, regulator-to-public, and regulator-to-government is crucial, as such continuity is required to buttress emergency response, our last line of defense in protecting public health and safety. It is the recognition of these facts that has driven many of the actions I have described tonight--the recognition that, despite our best efforts, something still could go awry. I might point out that, just within the past several weeks, at the initiative of the NRC, the NEA Committee on Nuclear Regulatory Activities (CNRA) and its member countries are planning an international exercise to assist in world-wide contingency planning.

Summary

I hope I have been able to convey a sense of the activities being conducted by the United States, and by the NRC in particular, to prepare for the impending turn of the century. Due to the intensity of the activities being conducted in this area, the actions I have described do not represent an exhaustive compilation. For this reason, I encourage you to optimize the use of this conference and similar venues to explore both the possibilities and the solutions for this problem. As I have stated, the U.S. and the NRC stand ready to provide technical information and support in whatever way we can. I have made copies of the generic NRC communications to which I have referred available to this conference. These documents, as well as additional information on NRC Y2K activities, also can be accessed on the NRC worldwide web page.

Thank you for your attention. I wish all of you every success in this very important endeavor.

Statement Submitted
by the
United States Nuclear Regulatory Commission
to the
Special Committee on the
Year 2000 Technology Problem
United States Senate
Concerning
Year 2000 Readiness of the Utility Industry

Presented by

Shirley Ann Jackson
Chairman

Submitted: June 12, 1998

U.S. Nuclear Regulatory Commission Testimony on Year 2000 Readiness

- Introduction
- The NRC Strategy for Addressing the Year 2000 Problem
  - Actions Internal to the NRC
  - NRC Interaction With Reactor Licensees
  - The NRC Role In Ensuring Electrical Grid Reliability
  - Conclusions

Introduction

Mr. Chairman, members of the Committee, I am pleased to be here today on behalf of the Commission to discuss with you the status of the U.S. Nuclear Regulatory Commission (NRC) response to the Year 2000 computer problem for nuclear power plants. Our efforts can be divided into three basic areas: our actions internal to the NRC, our interactions with our reactor licensees and the nuclear power industry, and our broader actions to address the issue of a reliable electrical grid.

The NRC Strategy for Addressing the Year 2000 Problem

Actions Internal to the NRC

With respect to power reactor licensees, the NRC is working to ensure that all of our mission-critical systems (seven in total) will be Year 2000 compliant so that our communications and data interfaces will continue to function properly. The one mission-critical system that is directly linked to operating nuclear power plants is our Emergency Response Data System (ERDS). This application performs the communication and data transmission functions that provide near real-time data to NRC incident response personnel during declared emergencies. The NRC currently is upgrading ERDS to be Year 2000 compliant in order to maintain the same communication protocol as the current system. Once upgraded, either a 2-digit or a 4-digit date field will be accepted. The upgrade is on schedule to be completed, tested, and implemented by March 4, 1999. This effort is being conducted under the NRC Year 2000 effort and is overseen by

Mr. Tony Galante, the NRC Chief Information Officer. All of our other mission-critical systems also are on schedule to be Year 2000 compliant in accordance with OMB guidelines, with three currently being repaired, and three being replaced.

NRC Interaction With Reactor Licensees

Since 1996, the NRC has been working with industry organizations to address the Year 2000 problem. After discussions with the Nuclear Energy Institute (NEI) in 1997, NEI agreed to take the lead in developing industry-wide guidance for addressing the Year 2000 problem at nuclear power reactors. Last November NEI sent a framework document, which NRC had reviewed, to all power reactor licensees. We believe that the guidance in that framework document, "Nuclear Utility Year 2000 Readiness" (NEI/NUSMG 97-07), when properly augmented and implemented, presents nuclear power plant licensees with an acceptable approach for addressing the Year 2000 problem. We will continue to work closely with other Federal agencies and industry groups, and to participate in interagency working groups, to ensure that we stay abreast of emerging Year 2000 concerns and that we take appropriate action to protect public health and safety and the environment. We strongly encourage licensees to share information regarding identified remediation and implementation activities, so that Year 2000 problems are identified early and addressed in a cost-effective manner.

In order to obtain confirmation that licensees are addressing the Year 2000 problem effectively with regard to compliance with the terms and conditions of their licenses and NRC regulations, the NRC is requiring that all operating nuclear power plant licensees submit a written response stating how they plan to address the Year 2000 problem. The written response is required by a Generic Letter issued on May 11, 1998, which has been developed and refined over the past six months.

A copy of that Generic Letter is being provided for the record (available at http://www.nrc.gov/NRC/NEWS/year2000.html). This Generic Letter refers to the NEI guidance document (NEI/NUSMG 97-07) as an example of an acceptable approach for addressing the Year 2000 issue at nuclear power plants.

By the middle of August 1998, the initial written response to the Generic Letter is due. In that response, nuclear power plant licensees will indicate whether they are pursuing a Year 2000 program based on the

NEI program or a different program. Licensees who elect to use a different program are required to present a brief description of that program, to ensure that the computer systems at their facilities will be ready for the Year 2000. In addition, all operating nuclear power plants are required to submit a written response no later than July 1, 1999, confirming that the facility is, or will be, Year 2000 ready by the Year 2000. If their program is incomplete as of July 1, 1999, their response must contain a status report, including completion schedules, for work remaining to ensure Year 2000 readiness.

In addition to the written responses, we plan to conduct inspections, on a sampling basis, to assess licensee preparedness for the Year 2000. Any Year 2000 program used at a nuclear facility must be tailored to meet the specific needs and requirements of that facility and should, in general, comprise the following phases: awareness, assessment, remediation, validation, and implementation. Completion of the Year 2000 program means that the licensee has attained their program objectives. These program objectives could range from having all computer systems and applications, including embedded systems, being Year 2000 compliant, to having some systems Year 2000 compliant and the remaining systems retired or having permanent and/or temporary compensatory measures in place.

Bounding the Year 2000 Concern for Nuclear Power Plants

The potential impact of the Year 2000 problem on nuclear power plants varies with the types of computer systems in use. Licensees rely upon: (1) software to schedule maintenance and technical specification surveillance, (2) programmable logic controllers and other commercial off-the-shelf software and hardware, (3) digital process control systems, such as a feedwater control or valve control, (4) digital systems for collecting operating data, and (5) digital systems to monitor post-accident plant conditions.

In addition to the reporting requirements in the Generic Letter, NRC regulations (10 CFR Part 21, 10 CFR 50.72, and 10 CFR 50.73) also require licensees to notify the NRC of significant deficiencies, significant non-conformances, and failures, such as some of those which could result from the Year 2000 problem in safety-related systems. To date, the NRC staff has not identified or received notification from licensees or vendors that a Year 2000 problem exists with safety-related initiation and actuation systems. However, some problems have been identified in computer-based systems that, while non-safety-related, are nonetheless important. Such systems, primarily databases and data collection processes necessary to satisfy license conditions, technical specifications, and NRC regulations that are date driven, may need to be modified for Year 2000 compliance.

Some examples of systems and computer equipment that are most likely to be affected by Year 2000 problems include:

- Plant security computers;
- Plant process systems (data scan, log, and alarm and safety parameter display system computers); and
- Radiation monitoring systems.

Because of the limited time remaining in which to address the problem, the majority of the program remediation, validation, and implementation activities should be completed at a facility by mid -1999, leaving only a few such activities scheduled for the third and fourth quarters of 1999. In addition, we recognize that despite every reasonable effort by licensees to identify and correct Year 2000 computer system problems at their facilities, some software, applications, equipment, and systems may remain

susceptible to the problem. Additionally, software, data, and systems external to the facility could potentially affect the facility adversely. Therefore, to ensure continued safe operation of the facility into the Year 2000 and beyond, licensees should formulate contingency plans for affected systems and equipment. The concept of Year 2000 readiness includes the planning, development, and implementation of appropriate contingency plans or compensatory actions for items that are not expected to be Year 2000 compliant, to address the possible impact that unrecognized problems may have on safe plant operation.

Interactions with the Nuclear Power Industry

The NRC has been involved actively with the nuclear industry in addressing the Year 2000 problem, and we are reasonably encouraged by industry efforts. We expect continuation of this effort in the response to the NRC Generic Letter that I mentioned earlier.

To ensure that senior level management at nuclear power plant licensees were aware of the Year 2000 problem, the first industry-wide NRC action was to issue Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In that Information Notice, the NRC staff described the potential problems that nuclear power plant computer systems and software may encounter during the transition to the new century. The NRC staff also encouraged licensees to examine their uses of computer systems and software well before the turn of the century, and suggested that licensees consider appropriate actions for examining and evaluating their computer systems for Year 2000 vulnerabilities.

At the Nuclear Utilities Software Management Group (NUSMG) Year 2000 Workshop, an industry workshop held in July 1997, selected nuclear power plant licensees described their Year 2000 programs and gave examples of areas in which they had addressed Year 2000 issues in order to ensure the safety and operability of their plants on and after January 1, 2000. Some of the issues discussed included: (1) the evaluation of the impact of the Year 2000 problem on plant equipment; (2) the assessment process involved in the identification of components, vendors, and interfaces; (3) the development of Year 2000 testing strategies; and (4) the identification of budget needs to address the Year 2000 problem.

In August 1997, the NRC staff incorporated recognition of the Year 2000 concern in the updated Standard Review Plan, NUREG-0800, Chapter 7, "Instrumentation and Control." This document provides guidance to NRC staff reviewers of computer-based instrumentation and control systems, to ensure that the Year 2000 issue was addressed in any new systems or modifications proposed by licensees.

Also in August 1997, the Nuclear Energy Institute (NEI) met with NUSMG and nuclear plant utility representatives to formulate an industry-wide plan to address the Year 2000 issue. On October 7, 1997, representatives of NEI and NUSMG met with the NRC staff to discuss the actions that NEI was taking to help utilities make their plants "Year 2000 ready." NEI presented the framework document discussed earlier. That document makes a distinction in terminology between the expressions, "Year 2000 ready," and "Year 2000 compliant." "Year 2000 compliant" is defined as those computer systems or applications that accurately process date/time data (including but not limited to calculating, comparing, and sequencing) from, into, and between the 20th and 21st centuries, the years 1999 and 2000, and leap-year calculations. "Year 2000 ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system or application is not fully "Year 2000 compliant."

NEI/NUSMG issued the framework document to all licensees in November 1997. The document recommends methods for nuclear utilities to attain Year 2000 readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their licenses. The scope of the document includes software, or software-based systems or interfaces, whose failure (due to the Year 2000 problem) would (1) prevent the performance of the safety function of a structure, system, or component, or (2) degrade, impair, or prevent compliance with the nuclear facility license and/or NRC regulations. After reviewing the document, the NRC has endorsed this document as an acceptable approach for dealing with the Year 2000 problem at nuclear power plants.

NEI/NUSMG 97-07 also suggests a strategy for developing and implementing a Year 2000 program for nuclear utilities. The strategy recognizes management, implementation, quality assurance (QA) measures, regulatory considerations, and documentation as the fundamental elements of a successful Year 2000 project. The document contains examples of strategies that licensees currently are using, and also recommends that the Year 2000 program be administered through standard project management techniques.

The recommended components for management planning are as follows: (1) management awareness, (2) sponsorship, (3) project leadership, (4) project objectives, (5) the project management team, (6) the management plan, (7) project reports, (8) interfaces, (9) resources, (10) oversight, and (11) quality assurance. The suggested phases of implementation are awareness, initial assessment (which includes inventory, categorization, classification, prioritization, and analysis of initial assessment), detailed assessment (including vendor evaluation, utility-owned or utility-supported software evaluation, interface evaluation, and remedial planning), remediation, Year 2000 testing and validation, and notification.

The QA measures specified in NEI/NUSMG 97-07 apply to project management QA and implementation QA. Regulatory considerations include the performance of appropriate reviews, reporting requirements, and documentation. Documentation of Year 2000 program activities and results includes documentation requirements, project management documentation, vendor documentation, inventory lists, checklists for initial and detailed assessments, and record retention. NEI/NUSMG 97-07 also contains examples of various plans and checklists as appendices, which may be used or modified to meet the licensee-specific needs and/or requirements.

It should be recognized that NEI/NUSMG 97-07 is programmatic, and does not address fully all the elements of a comprehensive Year 2000 program. In particular, augmented guidance in the area of risk management, business continuity and contingency planning, and remediation of embedded systems is needed to fully address some Year 2000 issues that may arise in licensee program implementation. The NRC staff believes that the guidance in NEI/NUSMG 97-07, when properly augmented and implemented, presents an example of one acceptable approach for licensees when addressing the Year 2000 problem at nuclear power plant facilities.

The NRC Role In Ensuring Electrical Grid Reliability

Although the primary focus with our licensees has been on public health and safety related to reactor operations, we recognize the concern that the Year 2000 problem may potentially affect the reliability of electrical grids. Our regulatory focus in electrical grid reliability primarily relates to the challenges to plant safety systems that might result from a transient on the electrical grid, such as a loss of offsite power. Nuclear power reactors have two independent sources of offsite power, and are designed to safely

shut down if a loss of all offsite power were to occur. In the event of a loss of offsite power, onsite electric power systems provide adequate electrical power to safely shutdown and cool down the reactors. As you know, NRC regulatory oversight and authority does not extend to the offsite electrical grid system.

Notwithstanding our regulatory limits, we recognize the national importance of a broader focus that helps to ensure that potential concerns with electrical grid reliability are identified and resolved. We support the efforts of the President's Council on Year 2000 Conversion and are members of the Energy Working Group. We are working closely with representatives from the Federal Energy Regulatory Commission and the Department of Energy to give assistance with, and share information on, potential problems associated with the Year 2000.

Conclusions

The NRC and the nuclear power industry are addressing the Year 2000 computer problem in a thorough and deliberate manner. To date, we have not identified or received notification from licensees or vendors that a Year 2000 problem exists with safety-related initiation and actuation systems. Further, we believe that we have, through Generic Letter 98-01 and the planned follow-up inspections, established a framework that appropriately assures us that the Year 2000 problem will not have an adverse impact on the ability of a nuclear power plant to safely operate or safely shut down. We recognize the importance of maintaining a reliable electrical grid, and we will continue to work with the President's Council on Year 2000 Conversion Energy Working Group, the Federal Energy Regulatory Commission, and the Department of Energy to give assistance and share information regarding potential problems associated with the coming of the Year 2000.

We look forward to working with the Special Committee and welcome your questions.

Statement Submitted
by the
United States Nuclear Regulatory Commission
to the
Subcommittee on Technology
Committee on Science
U.S. House of Representatives
on
Millennium Short Circuit:
The Y2K Effect on Energy Utilities

Presented by

Hugh L. Thompson, Jr.
Deputy Executive Director for Regulatory Programs

Submitted: May 14, 1998

Madam Chairwoman, members of the Subcommittee, I am pleased to be here today to describe how the U.S. Nuclear Regulatory Commission (NRC) is responding to the Year 2000 computer problem for operating nuclear power plants. Our efforts can be divided into three basic areas; our actions within NRC, our interactions with our licensees and the nuclear industry, and our interactions in the broader effort to address the issue of a reliable electrical grid.

The NRC Strategy for Addressing the Year 2000 Problem Actions Within NRC

With respect to power reactor licensees, the NRC is working to ensure that all of our systems critical to our mission will be Year 2000 compliant so that our communications and data interfaces will function well. The one mission critical system that is directly linked to operating nuclear power plants is our Emergency Response Data System (ERDS). This application performs the communication and data transmission functions that provide near real-time data to NRC incident response personnel during declared emergencies. The NRC is currently upgrading ERDS to be Year 2000 compliant in order to maintain the same communication protocol as the current system. Once upgraded, either a 2-digit or a 4-digit date field will be accepted. The upgrade is on schedule to be completed, tested and implemented by March 4, 1999. This effort is being conducted under NRC's own Year 2000 effort and is overseen by Mr. Tony Galante, the NRC's Chief Information Officer. All of our mission-critical systems are on schedule to be Year 2000 compliant in accordance with OMB's guidelines.

NRC's Interaction With Reactor Licensees

Since 1996, NRC has been working with industry organizations to address the Year 2000 problem. After discussions with the Nuclear Energy Institute (NEI) in 1997, they agreed to take the lead to develop industry-wide guidance for addressing the Year 2000 problem at nuclear power reactors. Last November a framework document, which NRC had reviewed, was sent to all power reactor licensees by NEI. We believe that the guidance in that framework document, "Nuclear Utility Year 2000 Readiness" (NEI/NUSMG 97-07), when properly augmented and implemented, presents nuclear power plant licensees with an acceptable approach for addressing the Year 2000 problem. We will continue to work closely with other Federal agencies and industry groups, and to participate in working groups, to ensure that we stay abreast of emerging Year 2000 concerns and take appropriate action to protect public health and safety and the environment. We strongly encourage licensees to share information regarding identified remediation and implementation activities so that Year 2000 problems are identified early and addressed in a cost-effective way.

In order to obtain confirmation that licensees are effectively addressing the Year 2000 problem with regard to compliance with the terms and conditions of their licenses and the NRC regulations, the NRC is requiring that all operating nuclear power plant licensees submit a written response stating how they plan to address the Year 2000 problem. The written response is required by a Generic Letter issued on May 11, 1998, which has been developed and refined over the past six months.

A copy of that Generic Letter is being provided for the record (available at http://www.nrc.gov/NRC/NEWS/year2000.html). This Generic Letter refers to the NEI guidance document (NEI/NUSMG 97-07) as an example of an acceptable approach for addressing the Year 2000 issue at nuclear power plants.

By the middle of August 1998, the initial written response to the Generic Letter is due. In that response, nuclear power plant licensees should indicate whether they are pursuing a Year 2000 program based on the NEI program or a different program. Licensees, who elect to use a different program, are required to present a brief description of the program that they are using to ensure that the computer systems at their facilities will be ready for the Year 2000. In addition, all operating nuclear power plants are required to submit a written response no later than July 1, 1999, confirming that the facility is or will be Year 2000 ready by the Year 2000. If their program is incomplete as of July 1, 1999, their response must contain a status report, including completion schedules, of work remaining to be done to confirm their facility will be Year 2000 ready.

In addition to the written responses, we plan to conduct inspections, on a sampling basis, to assess licensee preparedness for the Year 2000. Any Year 2000 program used at a nuclear facility must be tailored to meet the specific needs and requirements of that facility and should, in general, comprise the following phases: awareness, assessment, remediation, validation, and implementation. Completion of the Year 2000 program means that the licensee has attained the program objectives; these could range from all computer systems and applications, including embedded systems, being Year 2000 compliant, to some being Year 2000 compliant and the remaining retired or having permanent and/or temporary compensatory measures in place.

Bounding the Year 2000 Concern for Nuclear Power Plants

The potential impact of the Year 2000 problem on nuclear power plants varies with the types of computer systems in use. Licensees rely upon (1) software to schedule maintenance and technical specification surveillance, (2) programmable logic controllers and other commercial off-the-shelf software and hardware, (3) digital process control systems, such as a feedwater control or valve control, (4) digital systems for collecting operating data, and (5) digital systems to monitor post-accident plant conditions.

In addition to the reporting requirements in the Generic Letter, NRC regulations (10 CFR Part 21, 10 CFR 50.72, and 10 CFR 50.73) also require licensees to notify the NRC of significant deficiencies, significant non-conformances, and failures, such as some of those which could result from the Year 2000 problem in safety-related systems. To date, the NRC staff has not identified or received notification from licensees or vendors that a Year 2000 problem exists with safety-related initiation and actuation systems. However, problems have been identified in non-safety, but important, computer-based systems. Such systems, primarily databases and data collection processes necessary to satisfy license conditions, technical specifications, and NRC regulations that are date driven, may need to be modified for Year 2000 compliance.

Some examples of systems and computer equipment that are most likely to be affected by Year 2000 problems follow:

- Plant security computers
- Plant process systems (data scan, log, and alarm and safety parameter display system computers)
- Radiation monitoring systems

Because of the limited time remaining in which to address the problem, the majority of the program remediation, validation, and implementation activities should be completed at a facility by mid -1999, leaving only a few such activities scheduled for the third and fourth quarters of 1999. In addition, we recognize that despite every reasonable effort by licensees to identify and correct Year 2000 computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could potentially affect the facility adversely. Therefore, to ensure continued safe operation of the facility into the Year 2000 and beyond, licensees should formulate contingency plans for affected systems and equipment. The concept of Year 2000 readiness includes the planning, development, and implementation of appropriate contingency plans or compensatory actions for items that are not expected to be Year 2000 compliant or ready and to address the possible impact that unrecognized problems may have on safe plant operation.

Interactions with the Nuclear Power Industry

NRC has been actively involved with the nuclear industry in addressing the Year 2000 problem and we are reasonably encouraged by the industry's efforts. We expect continuation of this effort in the response to the Generic Letter that I mentioned earlier.

To ensure that senior level management at nuclear power plant licensees were aware of the Year 2000 problem, the first industry-wide NRC action was to issue Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In that Information Notice, the NRC staff described the potential problems that nuclear power plant computer systems and software may encounter as a result of the change to the new century. The NRC staff also encouraged licensees to examine their

uses of computer systems and software well before the turn of the century and suggested that licensees consider appropriate actions for examining and evaluating their computer systems for Year 2000 vulnerabilities.

At the Nuclear Utilities Software Management Group (NUSMG) Year 2000 Workshop, an industry workshop held in July 1997, selected nuclear power plant licensees described their Year 2000 programs and gave examples of areas in which they had addressed Year 2000 issues in order to ensure the safety and operability of their plants on and after January 1, 2000. Some of the issues discussed were (1) the evaluation of the impact of the Year 2000 problem on plant equipment, (2) the assessment process involved in the identification of components, vendors, and interfaces, (3) the development of Year 2000 testing strategies, and (4) the identification of budget needs to address the Year 2000 problem.

In August 1997, the NRC staff incorporated recognition of the Year 2000 concern in the updated Standard Review Plan, NUREG-0800, Chapter 7, "Instrumentation and Control." This document provides guidance to the NRC staff's reviewer of computer-based instrumentation and control systems to ensure the Year 2000 issue was addressed in new systems or modifications being proposed by licensees.

Also in August 1997, the Nuclear Energy Institute (NEI) met with NUSMG and nuclear plant utility representatives to formulate an industry-wide plan to address the Year 2000 issue. On October 7, 1997, representatives of NEI and NUSMG met with the NRC staff to discuss the actions NEI was taking to help utilities make their plants "Year 2000 ready." NEI presented the framework document discussed earlier. That document makes a distinction in terminology between "Year 2000 ready" and "Year 2000 compliant." "Year 2000 compliant" is defined as computer systems or applications that accurately process date/time data (including but not limited to calculating, comparing, and sequencing) from, into, and between the 20th and 21st centuries, the years 1999 and 2000, and leap-year calculations. "Year 2000 ready" is defined as a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system or application is not fully Year 2000 compliant.

NEI/NUSMG issued the framework document to all licensees in November 1997. The document recommends methods for nuclear utilities to attain Year 2000 readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license. The scope of the document includes software, or software-based systems or interfaces, whose failure (due to the Year 2000 problem) would (1) prevent the performance of the safety function of a structure, system, or component or (2) degrade, impair, or prevent compliance with the nuclear facility license and NRC regulations. After reviewing the document, the NRC has endorsed this document as an acceptable approach for dealing with the Year 2000 problem at nuclear power plants.

NEI/NUSMG 97-07 also suggests a strategy for developing and implementing a Year 2000 program for nuclear utilities. The strategy recognizes management, implementation, quality assurance (QA) measures, regulatory considerations, and documentation as the fundamental elements of a successful Year 2000 project. The document contains examples of strategies that licensees are currently using and also recommends that the Year 2000 program be administered through standard project management techniques.

The recommended components for management planning are (1) management awareness, (2) sponsorship, (3) project leadership, (4) project objectives, (5) the project management team, (6) the management plan, (7) project reports, (8) interfaces, (9) resources, (10) oversight, and (11) quality

assurance. The suggested phases of implementation are awareness, initial assessment (which includes inventory, categorization, classification, prioritization, and analysis of initial assessment), detailed assessment (including vendor evaluation, utility-owned or utility-supported software evaluation, interface evaluation, and remedial planning), remediation, Year 2000 testing and validation, and notification.

The QA measures specified in NEI/NUSMG 97-07 apply to project management QA and implementation QA. Regulatory considerations include the performance of appropriate reviews, reporting requirements, and documentation. Documentation of Year 2000 program activities and results includes documentation requirements, project management documentation, vendor documentation, inventory lists, checklists for initial and detailed assessments, and record retention. NEI/NUSMG 97-07 also contains examples of various plans and checklists as appendices, which may be used or modified to meet the licensee's specific needs and/or requirements.

It should be recognized that NEI/NUSMG 97-07 is programmatic and does not fully address all the elements of a comprehensive Year 2000 program. In particular, augmented guidance in the area of risk management, business continuity and contingency planning, and remediation of embedded systems is needed to fully address some Year 2000 issues that may arise in licensee program implementation. The NRC staff believes that the guidance in NEI/NUSMG 97-07, when properly augmented and implemented, presents an example of one approach for licensees when addressing the Year 2000 problem at nuclear power plant facilities.

The Nuclear Regulatory Commission's Role For Electrical Grids

Although the primary focus with our licensees has been on public health and safety related to reactor operations, we recognize the concern that the Year 2000 problem may potentially affect the reliability of electrical grids. Our regulatory focus in electrical grid reliability primarily relates to the challenges to plant safety systems that might occur as a result of a transient on the electrical grid, such as a loss of offsite power. Nuclear power reactors have two independent sources of offsite power and are designed to safely shut down if a loss of all offsite power were to occur. In the event of a loss of offsite power, onsite electric power systems provide adequate electrical power to safely shutdown and cool down the reactors. As you know, NRC's regulatory oversight and authority does not extend to the offsite electrical grid system.

Notwithstanding our regulatory limits, we recognize the national importance of a broader focus that helps ensure that potential concerns with electrical grid reliability are identified and resolved. We support the efforts of the President's Council on Year 2000 Conversion and are members of the Energy Working Group. We are working closely with representatives from the Federal Energy Regulatory Commission and the Department of Energy to give assistance with, and share information on, potential problems associated with the Year 2000.

Conclusions

The NRC and the nuclear power industry are addressing the Year 2000 computer problem in a thorough and deliberate manner. To date, we have not identified or received notification from licensees or vendors that a Year 2000 problem exists with safety-related initiation and actuation systems. Further, we believe that we have, through Generic Letter 98-01 and the planned follow-up inspections, established a framework that appropriately assures us that the Year 2000 problem will not have an adverse impact on

the ability of a nuclear power plant to safely operate or shut down. We recognize the importance of maintaining a reliable electrical grid and will continue to work with the President's Council on Year 2000 Conversion Energy Working Group, the Federal Energy Regulatory Commission, and the Department of Energy to give assistance and share information regarding potential problems associated with the coming of the Year 2000.

We look forward to working with the Subcommittee and welcome your questions.

[NRC Year 2000 Home Page | NRC Home Page]

Y2K EARLY WARNING SYSTEM (YEWS)
Frequently Asked Questions
(Updated 00-01-21)

NEWS!

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What is YEWS?

YEWS is a secure, proprietary, Internet-based communications system that allows for rapid transmission of information on the status of nuclear facility operations, local grid stability and telecommunications during the Y2K transition period. Regulatory authorities throughout the world have been invited to participate in this system. YEWS is a free service.

Is YEWS an emergency notification system?

No, YEWS is **not** an emergency notification system. YEWS was developed for the purpose of providing near real time information on the status of nuclear facility operations during the Y2K transition. Unlike other reporting systems, it has provisions for reporting no Y2K effects as well as reporting problems. In addition, the reporting threshold for YEWS is

lower than for existing emergency notification systems and is not restricted to radiological events.

Who created YEWS?

The first YEWS model was developed by the NRC and introduced to countries participating in the NEA's Committee on Nuclear Regulatory Agencies (CNRA) in March 1999 following an NEA sponsored international Y2K workshop in February 1999. The second YEWS model was presented in June 1999. Its design was based on comments received from CNRA member countries, U.S. reactor operators and utilities, industry groups, U.S. government agencies, and internal NRC peer review.

Who can participate in YEWS?

Participation in YEWS is voluntary and open to all countries who agree to abide by its terms of use (see below). For security reasons access to YEWS is restricted to participants who make a formal request for access and have a bonafide reason to participate (such as regulatory bodies, facility operators, national government agencies, etc.). YEWS is not open to commercial entities.

The following countries have nominated YEWS contacts:

Argentina, Austria, Australia, Belgium, Bulgaria, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Korea (Republic Of), Lithuania, Mexico, Netherlands, Norway, Pakistan, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, (Taiwan), Turkey, Ukraine , United Kingdom, United States of America.

Do I need special software to use YEWS?

No, you don't. All you need is access to the Internet.

Who enters data into YEWS?

Participating countries have nominated central YEWS data collection entities who are responsible for entering data. It is usually the regulatory body.

Who can read YEWS data?

All participants can read **all** YEWS data.

How do I gain access to YEWS?

Send a your request (letter, fax, or e-mail) for user identification codes and passwords to:

Mr. Clarence Breskovic
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
MS O4E9
Rockville, MD 20852
USA
Fax: 1-301-415-2395
E-mail: cpb@nrc.gov

Your request should include:

Name and contact information (organization name, mailing address, telephone and fax numbers, e-mail address) of the requestor, names and contact information of the individuals for whom access is requested, the type of access requested for each individual (read/write or read only), and the names of the facilities the individuals will be reporting on. Also, please

provide the Internet domain names of the computers the individuals will be using to access YEWS (for example: aol.com, nrc.gov, or kins.re.kr) and if possible the static IP address of the computers, should they have one (ask your computer technician for this information). Also please include the type and version of Internet browser you are using (Internet Explorer, Netscape, or Opera, or....).

YEWS Poster

The YEWS poster groups all operating nuclear power reactors by time zone. It shows when it will be midnight at these plants versus Eastern Standard Time and UTC/GMT.

You can download a PDF version of the poster here.
Make sure you reload the page to get the latest version!

Download the companion data sheets
(all facilities in the YEWS database & data grouped by time zone)

Zone -8, Zone -7, Zone -6, Zone -5, Zone -4, Zone -3, Zone -2, Zone 0,
Zone 1, Zone 2, Zone 3, Zone 4, Zone 5, Zone 5.5, Zone 8, Zone 9, Zone 12

Get the Adobe Acrobat Reader here (to read PDF files)

Terms of Use and Disclaimer:

Access to and the use of the Y2K Early Warning System (YEWS) shall impose the following obligations on the user:

Terms:

NON-DISCLOSURE

As consideration for having access to or receiving any proprietary information, participants agree to protect the confidentiality of the proprietary information, and shall not disclose or disseminate, or permit any employee or associate to disclose or disseminate, the proprietary information to any third party without the originator's prior written consent.

DISCLAIMER - USE AT YOUR OWN RISK

The data provided by the Y2K Early Warning System, also known as YEWS, is provided "AS IS" and any express or implied warranties including, but not limited to, the warranty of fitness for a particular purpose are disclaimed. In no event shall the U.S. Government, the U.S. Nuclear Regulatory Commission, the OECD Nuclear Energy Agency, or any other participating entity, be liable for any direct or special, indirect or consequential or special damages or any other damages whatsoever, including but not limited to claims associated with the loss of data or profits, which may result from an action in tort, contract, negligence, liability, or from any other claim that arises out of or in connection with the access, use or performance of this data.

Neither the U.S. Government, the U.S. Nuclear Regulatory Commission, the OECD Nuclear Energy Agency, other participating entities, nor any of their employees or contractors, make any warranty, express or implied, including the warranty of fitness for a particular purpose, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any data to which access has been acquired through YEWS information, apparatus, products, or process disclosed, or represents that its use would not infringe privately owned rights.

The information contained herein is provided for general information purpose only and should not be acted upon without specific technical advice based on particular

circumstances.

URL: http://www.nrc.gov/IP/Y2K/yewsfaq.htm

Pages are designed for 800x600 screen resolution.
Clarence Breskovic 00-01-21

Federal Register: January 20, 1999, Volume 64, Number 12, Pages 3139-3140

NUCLEAR REGULATORY COMMISSION

Contingency Plan for the Year 2000 Issue in the Nuclear Industry

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of availability and request for comments.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is making available a draft document entitled, "Contingency Plan for the Year 2000 Issue in the Nuclear Industry." This document describes the current plan and approach the NRC staff expects to use in addressing contingencies resulting from potential unanticipated events due to the Year 2000 (Y2K) problem. The NRC staff believes prudent contingency planning for the Y2K problem is appropriate in addition to actions being taken by NRC licensees to achieve Y2K readiness of their facilities. The staff further recognizes the importance of a broader focus that will help to ensure that Y2K concerns regarding the national infrastructure are identified and resolved.

DATES: Public input is solicited on the overall scope and direction of the NRC Contingency Plan. To be most helpful, comments should be received no later than February 15, 1999. Comments received after this date may be considered in the further development of the Contingency Plan if practical to do so.

ADDRESSES: A copy of the draft Contingency Plan can be obtained via the World Wide Web at http://www.nrc.gov/NRC/Y2K/Y2KCP.html or from the NRC's Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC 20555; telephone 202-634-3273; fax 202-634-3343.

Mail Comments to: Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001 or fax to 301-415-5144. Comments may be hand-delivered to 11545 Rockville Pike, Rockville, Maryland between 7:45 a.m. and 4:15 p.m. on Federal workdays.

FOR FURTHER INFORMATION CONTACT: Joseph G. Giitter; Mail Stop T-4A43, Office for Evaluation and Analysis of Operational Data, Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone 301-415-7485; E-mail JGG@NRC.GOV.

SUPPLEMENTARY INFORMATION: The NRC is working with its licensees to ensure that their potential Year 2000 (Y2K) issues have been identified and corrected, and that the agency's own computer-based systems will continue to function properly during the transition from 1999 into 2000.

Nuclear power plant licensees indicate no significant Year 2000 problems with computer systems required for safe operation or shutdown of plants, since most are controlled by analog equipment that does not use computers. However, other non-safety computer systems used in such areas as control room displays, radiation monitoring and security functions may have potential problems. For this reason, and to be able to respond to potential unanticipated Y2K problems, the NRC is developing a contingency plan for ensuring that public health and safety and the environment will continue to be protected.

The Contingency Plan for the Year 2000 Issue, built around a reasonably conservative planning scenario, would establish NRC expectations for staff coordination with external stakeholders and staff actions to

be taken during the transition period.

The staff considers the NRC Year 2000 Contingency Plan to be a rapidly evolving product, subject to anticipated but very necessary coordination efforts with other Federal agencies and with NRC licensees. In its current form, the plan discusses actions and approaches involving potential policy issues that may require more formal Commission review and approval. However, the Commission has determined that the plan should be made available to the public at this time in order to promote communication and dialogue regarding the proposals discussed therein.

Dated at Rockville, Maryland, this 13th day of January, 1999.

For the Nuclear Regulatory Commission.
Frank J. Congel,
Director, Incident Response

CHAIRMAN JACKSON'S COMMENTS ON COMSECY 98-036

DRAFT Y2K CONTINGENCY PLANS

The staff is to be commended for work it has done to prepare the NRC for Y2K. Notwithstanding that the document is still a draft, I note that the subject report on Y2K contingencies is silent on several areas of potential concern.

The Y2K status report and work plan, prepared by the North American Electric Reliability Council, dated September 17, 1998, points out that the availability of voice and data communications present the greatest operating challenge to the electric power industry. Staff has acknowledged this report. As NRC emergency response is wholly dependent upon such communications, the following areas should be addressed by the staff

- Communications failures may result in isolated plants or regions, under situations in which plant events such as load rejections or equipment failures (such as annunciators) may occur and/or enforcement discretion may be requested. The staff should address the need to develop planning which considers these situations. Communications failures may result in licensees approaching resident inspectors with questions on enforcement discretion. The staff should develop guidance for both NRC staff and licensees in this area. Potential areas to be developed include:

    - Actions to be taken if communications partially or fully fail at a site or region during the Y2K transition, and requests for enforcement discretion are deemed necessary.

    - Planning scenarios and contingencies should evaluate contingencies for and provide time lines for and levels of staff response at headquarters, regions and sites during other critical dates which may cause grid or communications system disruptions. These plans should be communicated and maintained to ensue that the time lines remain viable.

    - These scenarios should incorporate contingencies associated with the internal NRC Y2K contingency planning.

    - Availability of staff for coverage of more than one shift at sites, regions or headquarters may be challenged. The staff should address planning scenarios or contingencies for this concern.

    - Contingency planning should consider the +12 and -12 hours times relative to critical dates, since some failures have been offset by 12 hours.

  The task force action items should have target dates established.

Staff should develop and run tabletop exercises and drills modeling potential Y2K scenarios, to evaluate NRC response capability and contingency plans in the event of various severities of communications and power failures. The adequacy of administrative and emergency response guidelines should be evaluated under multiple expected events and enforcement discretion challenges. Resident, regional and headquarters staffs should provide integrated response under various telecommunications and power failure modes. If practicable, staff should consider coordination with drills which licensees have planned to model Y2K challenges.

At a later date commensurate with the completion of plans, Commissioner assistants should be briefed with description of the scope and relevant details of internal and external NRC guidance, in a draft or approved status, which will be used in Y2K contingencies.

November 9, 1998

MEMORANDUM TO: John C. Hoyle, Secretary
FROM: Commissioner Jeffrey S. Merrifield
SUBJECT: COMSECY-98-036 DRAFT NRC CONTINGENCY PLAN FOR THE YEAR 2000 ISSUE IN THE NUCLEAR INDUSTRY

Given the seriousness of the potential consequences outlined in this plan, I believe that the Commission should consider including one of the Commissioners as part of the Executive Team that will be in standby mode on December 31, 1999. In addition, should the Commission decide to accept the staff recommendation of a back-up Operations Center in Region IV, we may also want to consider having a Commissioner present at that site as well.

If the Commission accepts the recommendations included in SECY-98-184, (upgrading the NRC Operations Center Emergency Telecommunications System), I believe we should expedite the purchase and installation of mobile satellite units at each nuclear power plant site to have this system operational prior to December 31, 1999.

cc: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan

November 13, 1998

MEMORANDUM TO:	John Hoyle, Secretary
FROM:	Edward McGaffigan, Jr. /S/
SUBJECT:	COMSECY-98-036--DRAFT NRC CONTINGENCY PLAN FOR THE YEAR 2000 ISSUE IN THE NUCLEAR INDUSTRY

I approve the staff's proposal to make draft NRC contingency plan for the Year 2000 issue available to the public at this time in order to promote the dialogue on the proposals discussed in the plan, subject to the following comments.

I support the use of enforcement discretion for allowing licensees to deviate from license conditions or technical specifications arising from Year 2000 complications that would otherwise require plant shutdown, which I understand has been recommended by the General Counsel. If a majority of the Commission agrees, the staff should develop and publish a Year 2000 transition/rollover enforcement discretion policy as part of its Year 2000 contingency planning, well in advance of the transition period.

I also note the concerns raised by the Nuclear Energy Institute in its November 9, 1998, letter to Chairman Jackson on Year 2000 issues. In that letter, NEI requests, as a voluntary alternative to the response required by Generic Letter 98-01, that the Commission allow licensees to report on the overall status of a nuclear plant Year 2000 readiness program under the Year 2000 Information Readiness Disclosure Act (Public Law 105-271). I encourage the staff to give immediate and favorable consideration to this request and request that the staff inform the Commission of its recommendation before the draft contingency plan is publicly released.

cc: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner Merrifield
OGC
EDO
OCA
CFO

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

December 1, 1999

NRC REGULATORY ISSUE SUMMARY 99-05 IMPLEMENTING PROCEDURE FOR POWER REACTOR NOEDS PROCESSED DURING THE Y2K TRANSITION

- Addressees
- Intent
- Background Information
- Summary of Issue
- Backfit Discussion
- *Federal Register* Notification
- Paperwork Reduction Act Statement

Addressees

All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Intent

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to advise addressees that the staff has prepared the attached implementing procedure for power reactor Year 2000 (Y2K)-related and other Notices of Enforcement Discretion (NOEDs). This procedure contains the process for granting or denying any NOEDs during the Y2K transition (December 31, 1999, through January 3, 2000), and implements the Commission's Enforcement Policy, Appendix E, published in the *Federal Register* on July 30, 1999.

Background Information

Y2K-related events arise from a date-related problem that is experienced by a software system, a software application, or a digital device at a key rollover date when the system, application, or device does not perform its intended function. The key rollover dates are January 1, 2000; February 29, 2000 (an uncommon leap day); and December 31, 2000 (the 366th day of an uncommon leap year).

The NRC expects all nuclear power plant licensees to operate their facilities safely in compliance with the NRC regulations, the plant license, including technical specifications (TSs), and other requirements. This expectation is true at all times, including during the Y2K transition period. Accordingly, the minimal acceptable safety standards during the Y2K rollover period will continue to be the same as those

during any other period.

Under rare circumstances -- circumstances not expected to be involved in the Y2K transition -- the NRC may allow temporary noncompliance with a TS. This situation arises because it is not possible to anticipate every contingency that might arise during the lifetime of a facility. Circumstances occasionally arise in which a licensee foresees that compliance with an NRC requirement would involve an unnecessary plant transient or startup delay, or that performance of testing, inspection, or system realignment is inappropriate with the specific plant conditions. For these rare and limited circumstances, the NRC's "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy, NUREG-1600), permits the NRC, at its discretion, either to defer or not enforce the applicable TSs. In these cases, a licensee may request that the NRC exercise its discretion to refrain from enforcing the applicable TSs before a violation occurs. This type of enforcement discretion is designated as a NOED and is addressed in Section VII.C of the Enforcement Policy. The NRC will take such an action and issue a NOED only when it is clearly satisfied that this action is consistent with the agency's mission to protect public health and safety.

Summary of Issue

The NRC's Enforcement Policy, Appendix E (published in the *Federal Register* [64 FR 41474] on July 30, 1999), describes NRC's interim policy for exercising NOEDs for nuclear power plants during the Y2K transition. All licensees have been declared Y2K-ready, and the need for enforcement discretion is considered unlikely.

It is recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could adversely affect the facility (for example, interruption of communications or partial loss of offsite power).

The electricity production and delivery systems, as two of the more important elements of the North American economic and social infrastructure, must remain dependable during Y2K transition or rollover periods. Most other critical elements of the infrastructure depend on the availability of an interconnected, stable, and reliable supply of electrical power. There is no doubt that cascading or even localized outages of generators and transmission facilities could have serious short-term and long-term consequences. Continued safe operation of nuclear power plants during Y2K transition or rollover periods will play a major role in maintaining stable and reliable electrical power supply systems, providing necessary reserve power if there are major losses at other generating facilities. However, for continued plant operation in certain noncompliance situations, NRC enforcement discretion is required.

The interim enforcement policy provides for the exercise of enforcement discretion to address noncompliance with license conditions, including TSs, because of Y2K transition or rollover issues. The interim enforcement policy applies to situations in which plant operation is needed to help maintain the stability and reliability of the electrical power supply system, even when license conditions, including TSs, would require a plant shutdown. If such situations occur, licensees are expected to follow the existing guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion <http://www.nrc.gov/NRC/IM/noed.html> to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. In Y2K-related situations in which forced compliance with

license conditions, including TSs, would require a plant shutdown, and continued plant operation is needed to help maintain a reliable and stable grid, licensees may request a NOED. The staff will consider such a request when the licensee has determined that:

(a) Complying with the license conditions, including TSs, in a Y2K-related situation would require a plant shutdown;

(b) Continued plant operation is needed to help maintain a reliable and stable grid; and

(c) Any decrease in safety as a result of continued plant operation is small (considering both risk and deterministic aspects), and reasonable assurance of public health and safety, the environment, and security is maintained with the enforcement discretion.

As part of its Y2K contingency plan, NRC has augmented staff at the Headquarters Operations Center for the Y2K transition and has established a backup team in the Region IV Incident Response Center (IRC). Other regional response centers will also be staffed.

Communication with NRC and NRC staff approval are required for continued plant operation in situations involving a NOED. Without NRC approval, licensees should take actions in conformance with their license conditions and applicable regulations (for example, 10 CFR 50.54(x), if appropriate). If communications are established but the volume of requests is such that the NRC staff cannot review and approve or deny them in a timely fashion, the staff will obtain sufficient safety-significant information from the licensee to make a prompt initial assessment. Unless the assessment is unfavorable, the licensee will be permitted to proceed with its planned course of action. A more detailed assessment will be made as soon as possible.

The Headquarters reactor safety team director, or his designee, and the regional administrators, or their designees, are delegated the authority from the Director, NRR, to grant or deny NOEDs. The Headquarters Y2K Response Team expects that the Region IV IRC and cognizant regional IRC teams (if other than Region IV) will participate in all telephone discussions with the licensee and all internal staff discussions, to the extent possible. The Headquarters Y2K Response Team will coordinate all NOED-related requests and activities, in conjunction with the cognizant regional team. Both teams will jointly evaluate such requests. The Headquarters Y2K Response Team will assume lead responsibility for the agency response to Y2K-related NOEDs. Depending on the nature of the request and the competing activities, the Headquarters team may request a regional team to take the lead for some NOED evaluations.

In the case of a Headquarters communications loss or an event such that the Headquarters Operations Center is no longer functional, the Region IV IRC will assume the coordination role. Region IV will attempt to restore communications between the licensee and the cognizant regional IRC team. In this situation, it is expected that Region IV will transfer the lead for NOED approval or denial to the cognizant regional IRC team on a case-by-case basis. If situations arise that result in a loss of communications between licensees and Headquarters and Region IV, any region can process and grant or deny NOED requests. The NRC organization having the lead will grant or deny the NOED request by telephone.

Backfit Discussion

This regulatory issue summary requests no action or written response. Consequently, the staff did not perform a backfit analysis.

Federal Register Notification

The staff did not publish a notice of opportunity for public comment in the *Federal Register* because this regulatory issue summary is informational and pertains to a staff procedure. The policy that the procedure implements was published in the *Federal Register* and the NRC staff considered all of the comments it received.

Paperwork Reduction Act Statement

This regulatory issue summary does not request any information collection.

Please contact the lead project manager listed below If there are any questions about this matter.

Original signed by

David B. Matthews, Director
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Lead Project Manager: Allen G. Hansen, NRR
301-415-1390
E-mail: agh@nrc.gov

Attachments: 1. Implementing Procedure for Power Reactor NOEDs Processed During the Y2K Transition
2. List of Recently Issued NRC Regulatory Issue Summaries

(ADAMS Accession Number ML993280306)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

August 10, 1999

NRC INFORMATION NOTICE 99-25: YEAR 2000 CONTINGENCY PLANNING ACTIVITIES

- Addressees
- Purpose
- Background
- Discussion

Addressees

All holders of operating licenses for nuclear power plants and fuel cycle facilities.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees about contingency planning activities being undertaken by the NRC in response to potential disruptions of telecommunications and electrical distribution systems that could occur during the Year 2000 (Y2K) transition period (December 31, 1999, through the first few days of 2000). It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Background

The Y2K issue involves potential date-related errors with computer systems, embedded software devices, and software applications. An example of a date-related problem is a software application or digital device that interprets the digits "00" to represent the year 1900 rather than the year 2000. Date-related errors can result in malfunctions of computer systems by producing erroneous data or failing to operate at all. These failures, if they were to occur, could potentially lead to the loss of electrical distribution or telecommunications systems.

The NRC has been working with licensees and numerous industry groups and government agencies to determine the possible extent of telecommunications and electrical distribution system disruptions that could occur during the Y2K transition, and their potential effects on nuclear power plants and fuel cycle facilities. The North American Electric Reliability Council (NERC), the U.S. Federal Communications Commission, and the representatives of the telecommunications industry have concluded, after extensive research, that no widespread disruptions to the telecommunications or electrical distribution systems are expected. Although we believe that any such disruptions would most likely not have a significant impact on any nuclear power plant or fuel cycle facility, the NRC staff has developed a Y2K contingency plan to (1) provide an alternate means of communication with NRC licensees and certificate holders in the event

of a telecommunications disruption and (2) provide for rapid NRC response to unexpected events during the Y2K transition, including licensee requests for enforcement discretion. The final version of the NRC Contingency Plan for the Year 2000 Issue in the Nuclear Industry is publicly available, and can be accessed from the NRC web site at http://www.nrc.gov/NRC/Y2K/Y2KCP.html.

Discussion

Telephone service to the NRC Headquarters Operations Center (HOC) is provided by several diverse and redundant routes. A local telephone outage in the metropolitan Washington, DC area could affect one of the routes, but would not be likely to cause a complete loss of telephone service to the HOC. Licensees and certificate holders wishing to contact the HOC should use the following numbers, in the priority listed:

301-816-5100
301-951-0550
301-415-0550
301-415-0553

The NRC Region IV Incident Response Center (IRC) in Arlington, Texas has been designated as the backup center for the HOC during the Y2K transition period. Callers unable to contact the HOC should contact the Region IV IRC at 817-860-8100.

The NRC is currently purchasing Iridium brand satellite telephones to be distributed to the resident inspectors' offices of every operating nuclear power plant, and to the Portsmouth and Paducah Gaseous Diffusion Plants (GDPs). Additionally, the HOC and each regional IRC will be equipped with similar satellite telephones. Nuclear power plant licensees and GDP certificate holders will be permitted to use the NRC satellite telephone for emergency response purposes, including immediate event notifications to the NRC. Satellite telephone numbers will be provided to each resident inspector's office.

The Office of the Manager, National Communication System (OMNCS) is the White House agency charged with coordinating and planning for communications to support national security and emergency preparedness (NS/EP) requirements. The NRC is a member organization of the National Communication System (NCS). Among the NS/EP programs sponsored by OMNCS is the Government Emergency Telecommunications Service (GETS). The major features of GETS are enhanced routing and priority treatment in the use of long-distance and local telephone networks to ensure a high probability of completing a call even if the public telephone network is highly congested. OMNCS makes GETS available to utility services that are sponsored by NCS member organizations. The NRC will sponsor all nuclear power plants and gaseous diffusion plants for participation in the GETS program. Information about the GETS program and instructions on how to apply for GETS calling cards are presented in Attachment 1. Licensees should follow the instructions on page 6 (State and local government user application instructions).

The NRC has assisted the Nuclear Energy Agency in developing a prototype of a Y2K early warning system (YEWS) that would be used by the NRC and other regulators to share information concerning Y2K problems that affect plant operations, telecommunications, or grid reliability. YEWS is an internet-based system that will be placed on a secure server. A number of countries have already agreed to use this system as their primary means of disseminating information during the Y2K transition period. Licensees interested in accessing international Y2K event information from the YEWS should send the

name of the single point of contact per site with the authority to access the YEWS, in writing, to Mr. Clarence Breskovic, Office of International Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Mail Stop T 04E9. Mr. Breskovic may be contacted at 301-415-2364, or by e-mail at cpb@nrc.gov, for further information concerning YEWS.

Nuclear power plant licensees will be contacted by the HOC for plant status beginning at approximately 15 minutes past midnight in the particular facility's time zone. The information that will be collected at that time will be similar to that gathered during the daily plant status call, except that the NRC will also be collecting data regarding any major Y2K transition anomalies noted by the facility, such as grid stability problems. This information will immediately be entered into the YEWS and will be shared will all users.

The NRC staff is proposing interim staff guidance on the process for the NRC to exercise enforcement discretion in certain situations in which power reactor licensees encounter Y2K-associated compliance problems in the Y2K transition period or in other key rollover periods. The exercise of enforcement discretion may support a licensee's decision to keep the plant in operation, if the licensee has determined that safety will not be unacceptably affected, in order to help maintain electrical grid stability and reliability. This proposed interim enforcement policy would provide for the exercise of enforcement discretion to address noncompliance with license conditions, including technical specifications (TSs), because of Y2K transition or rollover issues. The interim enforcement policy would apply to situations in which plant operation is needed to help maintain the stability and reliability of the electrical power supply system, even when license conditions, including TSs, would require a plant shutdown. If such situations occur, licensees would be expected to follow the existing guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion, which is available at http://www.nrc.gov/NRC/IM/noed.html, to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. The staff's interim enforcement discretion policy is available at http://www.nrc.gov/NRC/COMMISSION/SECYS/1999-135scy.html.

If you have any questions about the information in this notice, please contact one of the technical contacts listed below.

/s/'d by

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Technical Contacts:	Joseph Giitter, IRO 301-415-7485 E-mail: jgg@nrc.gov	John Jolicoeur, IRO 301-415-6383 E-mail: jrj1@nrc.gov

Attachments: 1. GETS Information Package [MS PowerPoint | Adobe PDF]
2. List of Recently Issued NRC Information Notices

(NUDOCS Accession Number 9908050024)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

April 28, 1999

NRC INFORMATION NOTICE 99-12: YEAR 2000 COMPUTER SYSTEMS READINESS AUDITS

- Addresses
- Purpose
- Background
- Description of Circumstances
- Discussion

Addresses

All holders of operating licenses or construction permits for nuclear power plants.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees of observations made by NRC staff during audits conducted on the Year 2000 (Y2K) readiness programs of twelve plants. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate. However, suggestions contained in this information notice are not NRC requirements: therefore, no specific action or written response is required.

Background

The Y2K issue involves potential date-related errors with computer systems, microprocessor-based (embedded software) devices, and software applications. An example of a date-related problem is a software application or digital device that misinterprets the numbers "00" to represent the year 1900 rather than the year 2000. Date-related errors can result in malfunctions of computer systems by providing erroneous data output or failing to operate at all.

On December 24, 1996, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," to alert nuclear power plant licensees of the Y2K issue. Subsequently, on May 11, 1998 and January 14, 1999, the NRC issued Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," and Supplement 1 to Generic Letter 98-01, respectively, requesting information regarding each licensee's program to address the Y2K computer systems issue. In GL 98-01, the staff determined that the Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) framework document, NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," is an acceptable approach to addressing the Y2K issue, provided licensees address the additional areas of risk management, business continuity and contingency planning, and remediation of

embedded systems. Subsequently, NEI/NUSMG issued NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," in August 1998, to address the additional areas cited by the NRC in GL 98-01.

Description of Circumstances

From September 1998 thru January 1999, NRC audit teams conducted twelve representative Y2K readiness audits at nuclear plant sites throughout the United States. The NRC staff determined that this approach was an appropriate means of oversight of licensee Y2K readiness efforts because all licensees had committed to the nuclear power industry Y2K readiness guidance, NEI/NUSMG 97-07, in their first response to NRC GL 98-01 and because the NRC staff had not identified any Y2K problems in safety-related actuation systems. The NRC staff selected a variety of types of plants of different ages and locations in order to obtain the necessary assurance that nuclear power industry Y2K readiness programs are being effectively implemented and that licensees are on schedule to meet the readiness target date of July 1, 1999, established in GL 98-01. The results of the audits were intended to determine the need for additional regulatory action. The sample of 12 licensees included large utilities such as Commonwealth Edison and Tennessee Valley Authority (TVA) as well as small single-unit licensees such as North Atlantic Energy (Seabrook) and Wolf Creek Nuclear Operating Corporation. Because licensee Y2K programs are corporate-wide, many of the NRC staff audits include more than a single nuclear power plant site since many utilities own more than one nuclear power plant. In all, a total of 42 of 103 operating nuclear power plant units were associated with the Y2K readiness program audits of 12 utilities. The 12 representative Y2K program audit sites included Braidwood, Brunswick, Davis-Besse, Hope Creek, Limerick, Monticello, North Anna, Seabrook, Washington Nuclear Project No. 2, Waterford, Watts Bar, and Wolf Creek.

In evaluating the audited Y2K programs, the staff did not identify any issues that would preclude the nuclear power plants from achieving Y2K readiness before January 1, 2000. The licensee Y2K programs are generally on schedule to be ready by July 1, 1999, and no Y2K problems were identified that directly impact the proper functioning of safety systems. However, the audits did identify some remaining remediation activities of certain software items and embedded systems which will prevent a number of licensees from meeting full program implementation by July 1, 1999. In those instances the remaining remediation activities of software applications and digital devices are scheduled for the Fall 1999. The schedule was frequently driven by licensee outage planning or equipment availability. The audit reports are publicly available and may be accessed from the NRC website at www.nrc.gov/NRC/Y2KNRR.html. [*This link is incorrect. It should be: http://www.nrc.gov/NRC/Y2K/Y2KNRR.html*]

At the time of the audits, most licensees were beginning the contingency planning phase of their actions to address the Y2K issue. Therefore, in an effort to verify and assess the effectiveness of licensee contingency planning, NRC staff will conduct audits focused in the area of Y2K contingency planning at six additional sites, involving licensees other than those that comprise the original 12. The sites selected are: Diablo Canyon, Duane Arnold, Indian Point 2, Oconee, Palo Verde and Turkey Point. As stated earlier, licensee Y2K programs are corporate - wide and many utilities own more than one nuclear power plant. Therefore, a total of 18 operating nuclear power plant units will be associated with these six licensee audits.

Further, NRC regional and resident staff will conduct additional Y2K readiness and contingency planning site-specific reviews at all commercial nuclear power plants. The six focused audits of

contingency planning and regional site-specific reviews will be completed by July 1999.

Discussion

Based on the 12 representative Y2K audit results, the staff observed several common factors among effective programs. The staff found that properly following the NEI/NUSMG 97-07 and NEI/NUSMG 98-07 guidance documents resulted in an overall functional and straight forward Y2K program. Effective Y2K programs have generally received appropriate management attention and support. The staff believes active management oversight is vital for program effectiveness. The staff found that central control of Y2K activities, independent peer reviews, and aggressive quality assurance involvement promotes consistency across program activities and products. In addition, the staff recognized that sharing information via owners groups and utility alliances aided licensees in the implementation of effective Y2K programs. The staff also concluded that corporate and plant programs should interface in order to achieve consistency in application and system readiness.

Most commercial nuclear power plants have protection systems based on analog technology rather than digital technology. Since Y2K concerns are associated with digital systems, analog reactor protection system functions are not affected directly by the Y2K problem. Although there is limited use of computer systems in nuclear power plant mission critical and safety-related functions, licensee Y2K programs have identified some software and digital devices that affect a small number of safety functions. None of these safety functions are actuation based.

Digital systems and components requiring remediation of Y2K-related problems perform functions such as post-accident sampling, fuel handling, core power distribution monitoring, and reactor vessel level measurement. Licensees have identified incorrect dates in safety-related printouts, logs, and displays in systems such as radiation monitoring. These errors, however, have not affected the functions performed by the devices or systems. There are mission critical non-safety-related functions such as digital feedwater controls, moisture separator reheater controls, reactor recirculating coolant controls, and motor generator set controls that are affected by the Y2K concern and have required remediation. These balance-of-plant functions are critical for power generation.

The audits revealed that licensees are actively addressing loss of off-site communications and grid instability issues which are addressed as part of their contingency planning. Based on the available contingency plans and licensees' scheduled evaluations, remediations, and testing, the staff did not identify any communication related issue that would prevent any audited plant from being Y2K ready by January 1, 2000. Licensees are continuing to evaluate their communication systems for susceptibility to the Y2K issue and have developed plans to cope with system failures. Licensees are interacting with the North American Electric Reliability Council (NERC) to develop electrical grid stability plans for generation and transmission. The licensees have identified grid instability as a factor to be included under external risk as part of the Y2K contingency planning effort. Nuclear plant licensees and the NRC recognize the national importance of having available the broadest range of electrical generating capability in order to cope with any unforseen Y2K impacts should they occur. However, NERC in their report to DOE, "Preparing the Electric Power Systems of North America For Transition to the Year 2000," dated September 17, 1998, states as follows: "Nuclear generating facilities are expected to be available to supply their share of energy needs and all nuclear safety systems are expected to be fully ready for Y2K." The NRC regulatory focus on electrical grid reliability is still related primarily to the challenges on plant safety systems.

Based on the regional site-specific reviews, contingency plan focused audits, and licensee responses to GL 98-01 or Supplement 1 of GL 98-01, the NRC will determine the need for future actions regarding the Y2K computer system readiness issue. The results of the these reviews and audits will be made publically available and may be accessed thru the NRC website at www.nrc.gov/NRC/NEWS/year2000.html.

This information notice requires no specific action or written response. However, recipients are reminded that they are required to consider industry-wide operating experience (including NRC information notices), where practical. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

/s/'d by
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Attachment: List of Recently Issued NRC Information Notices

(NUDOCS Accession Number 9904230323)

July 19, 1999

MEMORANDUM TO:	William D. Travers Executive Director for Operations
FROM:	Samuel J. Collins, Director Office of Nuclear Reactor Regulation
SUBJECT:	PRELIMINARY REPORT ON NUCLEAR POWER PLANT YEAR 2000 READINESS

This memorandum provides the staff's preliminary report on nuclear power plant (NPP) year 2000 (Y2K) readiness. The report integrates the results of regional staff reviews (conducted at each NPP site during the April-June 1999 period) with the initial Headquarters staff review of licensee responses to Generic Letter (GL) 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." Additional review and followup activities are continuing; a final report is expected in the form of a NUREG and will be issued by August 31, 1999. This preliminary report, as well as the final NUREG, will be placed in the Public Document Room and on the NRC's Y2K Web site.

Regional staff reviews of licensee Y2K activities were conducted at each NPP site during the April-June 1999 period following the guidance of Temporary Instruction 2515/141, "Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants." The reviews were conducted to verify that licensee Y2K programs and processes were being implemented consistent with the industry guidance in Nuclear Energy Institute/Nuclear Utilities Software Management Group(NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," both of which have been found acceptable by the staff. Because of the timing of the regional reviews, there were instances in which licensee activities had not progressed sufficiently for the NRC staff to conclude that all activities were being implemented in accordance with industry guidance.

On the basis of its review of the 103 operating power plant Y2K programs, the staff concludes that licensees for 89 nuclear power plants have implemented Y2K programs consistent with industry guidance. As described in the report, the staff has identified 14 plants at which a followup review will be conducted to provide a high level of confidence that licensee Y2K activities have been implemented consistent with industry guidance. Licensees for 10 of the 14 plants reported that they had completed their Y2K readiness activities by July 1, 1999. The followup onsite reviews are expected to be completed by August 13, 1999.

As reported in Press Release 99-138, issued on July 7, 1999, the NRC received responses to GL 98-01, Supplement 1, from licensees for all 103 operating nuclear power plants indicating that there are no Y2K-related problems that directly affect the performance of safety systems.

Licensees for 68 of the 103 plants reported that all their computer systems and digital embedded components that support plant operations are "Y2K ready."

Licensee reports also indicated that to be fully Y2K ready, licensees for 35 plants have additional work to complete on a few non-safety systems or components. These licensees provided scheduled completion dates for their plants. Of these 35 plants, 18 have systems or components that could affect power generation (e.g., digital feedwater controls and core performance monitoring systems). The remaining17 plants have systems or components that do not affect power generation (e.g., plant simulators and administrative systems that track maintenance activities). None of the remaining work in the 35 plants affects the ability of a plant to shut down safely, if necessary. Typically, completion of Y2K work after July 1, 1999, is necessary because of a scheduled plant outage in the fall of 1999 or because the licensee is waiting for delivery of a replacement component. The staff is committed to independently verify the completion of the remaining Y2K items at each of these 35 plants.

All licensees are expected to be Y2K ready before December 31, 1999. If, by September 30, 1999, it appears that Y2K readiness activities will not be completed in advance of the December 31, 1999 - January 1, 2000, transition, NRC will take appropriate action, including the issuance of shutdown orders, if warranted.

CONTACT: M. Waterman, NRR/DE 415-2818

Attachment: Preliminary Report

Preliminary Report on Nuclear Power Plant Year 2000 Readiness

July 16, 1999

Contact:

Michael E. Waterman
Electrical & Instrumentation and Controls Branch
Division of Engineering
Office of Nuclear Reactor Regulation

- Executive Summary
- 1.0 Introduction
- 2.0 Background
- 3.0 Review And Integration Approach
  - 3.1 Site Review Methodology
  - 3.2 Integration Process
- 4.0 NRC Y2K Review Results and Followup Actions
- 5.0 Preliminary Conclusions

Executive Summary

This report integrates the results of the staff's onsite Year 2000 (Y2K) readiness reviews of 103 nuclear power plants (NPPs) and licensee responses to Generic Letter (GL) 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." The onsite reviews were based on acceptance criteria developed from the staff-accepted industry guidance provided in Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."

On the basis of the staff's onsite reviews of licensee Y2K readiness activities at the 103 operating U.S. NPPs, the staff concludes that the licensees for 89 of the 103 NPPs have followed Y2K programs that are consistent with industry guidance. By August 13, 1999, the staff will conduct followup reviews of the remaining 14 plants to verify that licensee Y2K readiness activities are consistent with staff-accepted industry guidance.

Licensee responses to GL 98-01, Supplement 1, indicate that licensees for 68 nuclear power plants have achieved Y2K readiness as of July 1, 1999. Of the remaining 35 operating NPPs, licensees for 18 plants have yet to achieve Y2K readiness for digital systems or components that could affect plant operations. None of these systems or components are part of the safety systems designed to shut down a reactor or activate systems and components required for accident mitigation. Each of these plants has a small number of incomplete items; typically, the licensee is awaiting delivery of a replacement component or a scheduled outage in the fall of 1999. The staff will verify completion of the remaining activities for all 35 plants as Y2K readiness activities are completed. All NPPs are expected to be Y2K ready before the transition from 1999 to 2000.

1.0 Introduction

This report integrates the initial Headquarters staff review of licensee responses to GL 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," with the results of regional staff reviews conducted at each NPP site during the April-June 1999 period. Additional review and followup activities are continuing; a final report is being prepared in the form of a NUREG and will be issued by August 31, 1999. This preliminary report, as well as the final NUREG, will be placed in the Public Document Room (PDR) and on the NRC's Y2K Web site.

Regional staff reviews of licensee Y2K activities were conducted at each NPP site during the April-June 1999 period following the guidance of Temporary Instruction (TI) 2515/141, "Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants." NRC conducted reviews to verify that licensee Y2K programs and processes were being implemented consistent with the industry guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07, both of which have been found acceptable by the staff. Additionally, as the NRC reported in Press Release 99-138, issued on July 7, 1999, the NRC received responses to GL 98-01, Supplement 1, from licensees of all 103 operating NPPs indicating that there are no Y2K-related problems that directly affect the performance of safety systems. These two sources of information regarding Y2K readiness have been incorporated into in this report.

Section 2.0, "Background," summarizes the nature of the Y2K problem, the history of NRC activities related to resolution of this problem in the nuclear power industry, and the scope of activities conducted by the staff to verify that licensees will be Y2K ready before the end of 1999. Section 3.0, "Review and Integration Approach," describes the methodology used by the NRC staff to perform the 66 NPP onsite reviews of licensee Y2K activities and integrates the results of the site reviews with the responses to GL 98-01, Supplement 1. Section 4.0, "NRC Y2K Review Results and Followup Actions" summarizes the results of NRC staff reviews of licensee Y2K program activities and the licensee responses to GL 98-01, Supplement 1. Section 5.0, "Preliminary Conclusions," describes preliminary staff conclusions regarding Y2K readiness in U.S. NPPs.

2.0 Background

The Y2K computer problem pertains to the potential for date-related problems that may occur in a software system or an embedded digital component. These problems include not representing the year properly, not recognizing leap years, and improper date-based or time-based calculations. An example of a date-related problem is misreading "00" as the year 1900 rather than 2000, which could cause some computer systems to malfunction. A software system or an embedded component that is determined to be "Y2K compliant" accurately processes date and time data (including calculating, comparing, and sequencing data) from, into, and between the years 1999 and 2000. A software system or an embedded component that is determined to be "Y2K ready" performs its functions correctly, although the system or component is not Y2K compliant.

In NPP safety systems and plant operations systems that use software systems or embedded components, the Y2K problem could cause an event such as a plant trip, or could affect systems that either report post-shutdown plant status or that support emergency data collection capabilities. Additionally, to the extent that a Y2K deficiency could cause an NPP trip or transient, the resulting loss of electrical generation could introduce an electrical distribution grid instability and a resulting loss of offsite power. Y2K issues can also affect plant support or administrative systems. Most NPP safety systems are analog systems and, consequently, are not affected by Y2K issues.

Since 1996, the NRC has been working with NPP licensees to ensure that NPP systems are Y2K ready before 2000. To ensure that senior level management at operating U.S. NPPs were aware of the Y2K issue, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the staff described the potential problems that nuclear facility computer systems and software might encounter during the transition from 1999 to 2000. The NRC sent copies of this information notice to all U.S. NPP licensees, fuel cycle facility licensees, and nuclear materials licensees.

In 1997, the NEI took the lead in developing industry-wide guidance for addressing Y2K issues in the nuclear power industry and, with cooperation from the Nuclear Utility Software Management Group (NUSMG), issued NEI/NUSMG 97-07. Subsequently, NEI and NUSMG issued NEI/NUSMG 98-07. In Generic Letter (GL) 98-01 and its supplement, the NRC accepted the guidance provided in NEI/NUSMG 97-07 and NEI/NUSMG 98-07 as appropriate methodologies for addressing Y2K readiness in NPPs.

In GL 98-01, the NRC requested all holders of operating licenses for NPPs to inform the NRC of steps they were taking to ensure that computer systems will function properly by 2000. All licensees responded to GL 98-01, stating that an NRC-accepted program (NEI/NUSMG 97-07 and NEI/NUSMG 98-07) had been adopted, the program addressed both safety-related and non-safety-related systems and components, and the plants would be Y2K ready by 2000. GL 98-01 also required the licensees to confirm that their plants would be Y2K ready, including contingency planning, no later than July 1, 1999. Licensees not Y2K ready by July 1, 1999, were required to provide a status report,

including completion schedules for work remaining to be done, to confirm their plants would be Y2K ready by 2000.

Beginning in mid-1998, the NRC audited 12 Y2K programs at different NPP sites. The staff did not identify any Y2K issues that would preclude the audited licensees from achieving Y2K readiness. The information obtained during these audits and from other licensees and industry groups indicated that significant Y2K problems do not exist in those NPP systems that affect the ability to safely operate and shut down NPPs. However, licensees have discovered Y2K problems in non-safety (but nevertheless important) computer-based systems, such as security computers, control room display systems, engineering software, control systems, radiation monitoring systems, emergency response systems, and communications systems.

The NRC issued Supplement 1 to GL 98-01 in January 1999. The scope of this supplement is broader than the scope of the original GL 98-01. The supplemental request for information, which was voluntary and also due by July 1, 1999, expanded the scope of the reporting requirements to include systems that are not addressed by the plant license and NRC regulations but are necessary for continued plant operations.

In March 1999, the NRC expanded its scope of Y2K readiness program reviews to include all operating NPP sites. These 66 site reviews, covering 103 NPPs, were completed by June 30, 1999. As described in Section 4.0, the staff evaluated the reviews and is scheduling followup reviews for selected plants that had not sufficiently completed Y2K readiness preparations at the time of the site reviews.

During May and June 1999, the staff also conducted six detailed audits of licensee contingency planning activities. In these audits, the staff reviewed approximately 15 to 20 licensee system and component contingency plans, contingency plans for internal facility risks, contingency plans for external risks, and the integrated contingency plan (typically, in the 66 onsite reviews, the staff reviewed 6 contingency plans for software or components). The acceptance criteria for these audits were the same as the acceptance criteria used in the 66 NPP onsite reviews.

By July 1, 1999, the staff had received responses to GL 98-01, Supplement 1, from licensees for all 103 operating NPPs. As described in Section 4.0, the staff reviewed these responses and integrated the results of these reviews with the results of the staff's onsite reviews of licensee Y2K readiness programs.

3.0 Review And Integration Approach

This section describes the methodology used by the NRC staff to conduct Y2K reviews at each of the 66 NPP sites comprising the 103 operating NPPs and the integration of those review results with the licensee responses to GL 98-01, Supplement 1.

3.1 Site Review Methodology

The NRC conducted reviews at each NPP site. These reviews addressed 452 acceptance criteria (TI 2515/141, Appendix A) that were based on guidance provided in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. A checklist format was used to ensure that the reviews would be conducted consistently at each NPP site. Additional guidance for completing the checklists was provided to NRC reviewers in training sessions and in telephone calls between the reviewers and NRC Headquarters staff.

The checklist is divided into three major areas of Y2K readiness acceptance criteria: (1) planning and initial assessment, (2) detailed assessment, and (3) contingency planning. These three major areas are further subdivided into more specific areas of acceptance criteria, which are shown in the following list:

Planning and Initial Assessment

- Management Planning
- Documentation
- Implementation Plans
- Initial Assessment

Detailed Assessment

- System/Component Detailed Assessment
- System/Component Remediation
- System/Component Testing and Validation

- System/Component Notification

Contingency Planning

- System/Component Contingency Planning
- Contingency Planning for Internal Facility Risks
- Contingency Planning for External Risks
- Integrated Contingency Planning

To review detailed assessment activities, the staff selected a system or a component from each of the following six plant system classes:

- Reactor Protection System/Engineered Safety Features System (including emergency diesel generators)
- Feedwater System/Balance of Plant Systems
- Radiation Monitoring Systems
- Emergency Notification Systems
- Plant Process Computer Systems
- Plant Security Systems

One system or component from each of these system/component classes was reviewed during each NPP onsite review. The one exception to this approach occurred in several of the older plants in which no digital systems or components are used in the reactor protection system or the engineered safety features systems (i.e., there are no potential Y2K vulnerabilities in these systems because the systems use only analog technology). These six classes of plant systems were chosen to ensure that any system or component could be reviewed by the NRC during the plant onsite review, thereby allowing the staff to assess the full scope of each licensee's Y2K readiness program.

3.2 Integration Process

The integration process to develop an overall perspective of licensee Y2K readiness involved a three-step process. The first step involved staff onsite reviews of licensee Y2K readiness activities during the April-June 1999 period using the acceptance criteria checklist described in Section 3.1, above. The second step involved a review of licensee GL 98-01, Supplement 1, responses, all of which were received from the licensees by July 1, 1999. The final step involved integration of the results of the first two steps to determine licensee Y2K readiness and the need for regulatory followup actions. The results of the third step are discussed in Section 4.0.

In the first step, the NRC staff reviewed Y2K readiness programs and implementation progress at each of the 66 NPP sites comprising the 103 operating NPPs. Because of the timing of the onsite reviews, the staff expected to identify instances of incomplete Y2K readiness. Each review involved discussions with the licensee's Y2K technical staff and reviews of licensee documents and work practices. To ensure consistency in the reviews, the staff developed acceptance criteria in the form of a 452-question checklist, which is described in Section 3.1. These checklists were completed by NRC staff reviewers and forwarded to the Headquarters staff for evaluation and integration with the licensee responses to GL 98-01, Supplement 1. The staff's onsite review activity was documented in routine Resident Inspector reports.

In the second step, NRC staff reviewed licensee responses to GL 98-01, Supplement 1. In responding to GL 98-01, Supplement 1, licensees provided the expected completion date of their Y2K readiness program and, if the completion date was later than July 1, 1999, the licensee's schedule for completing Y2K readiness activities. Licensee responses to GL 98-01, Supplement 1, are available in the PDR.

In the third step, the NRC staff reviewed the acceptance criteria checklists prepared by the NRC staff reviewers and integrated the results of these reviews with the licensee responses to GL 98-01. The results of this integration process are provided in the following section.

4.0 NRC Y2K Review Results and Followup Actions

The staff compared the results of the acceptance criteria checklist assessments from the onsite reviews with the licensee responses to GL 98-01, Supplement 1, to identify areas requiring additional staff followup actions and reviews. All licensees were following the NRC-approved industry guidance and, at the time of the staff's site review, 89 NPPs

were sufficiently complete that the TI 2515/141 reviews were closed. Even though the TI was closed, in some cases, (17 NPPs) a licensee had not completed all Y2K activities at the time of the staff's onsite review (some reviews were conducted in April and early May). For example, the licensee may not have completed remediation of a plant system or a component, or may not have completed some aspect of contingency planning activities at the time of the staff's review. However, the staff found that sufficient work had been completed in related Y2K activity areas such that the staff had a high level of confidence that the unreviewed activities would be completed consistent with industry guidelines. Because the overall implementation progress at the NPP was close to complete, these NPPs will not receive followup reviews.

Fourteen NPPs had not sufficiently completed Y2K activities at the time of the site review. The staff concluded that these licensees were following the industry guidance but that a followup review would be appropriate before closing TI 2515/141. Table 1 lists the 14 plants that will receive followup reviews by August 13, 1999. Licensee responses to GL 98-01, Supplement 1, reported that 10 of these 14 plants were Y2K ready.

Responses to GL 98-01, Supplement 1, indicated that licensees for 35 of the 103 operating NPPs have additional work to complete on a few non-safety computer systems or devices in order to be fully Y2K ready. The licensees provided scheduled completion dates for these plants. Tables 2 and 3 list the NPPs that licensees reported were not Y2K ready on July 1, 1999, the latest scheduled completion dates for Y2K-related activities, the systems requiring Y2K remediation, and the reason for the delay. Typically, completion of Y2K work after July 1, 1999, is necessary because of a scheduled plant outage in the fall of 1999 or because the licensee is waiting for delivery of a replacement component.

Of the 35 NPPs that were not Y2K ready on July 1, 1999, 18 plants have systems or components that could affect plant operations, for example, digital feedwater controls and core performance monitoring systems (see Table 2). The remaining 17 plants have systems or components that do not affect plant operations, for example, plant simulators and administrative systems that track maintenance activities (see Table 3). None of the remaining work at the 35 NPPs affects the ability of a plant to shut down safely, if necessary. The staff will verify completion of the remaining Y2K items at each of the 35 NPPs.

Table 4 lists the 68 plants that have been reported as Y2K ready in the licensee responses to GL 98-01 Supplement 1.

5.0 Preliminary Conclusions

On the basis of the results of the staff's Y2K site reviews of the 103 operating NPPs and the licensees' responses to GL 98-01, Supplement 1, the following preliminary conclusions are provided:

- All licensees are following the staff-approved industry guidance of NEI/NUSMG 97-07 and NEI/NUSMG 98-07 to address the Y2K issue. At the time of the staff's initial review, licensees for 89 NPPs had implemented Y2K programs consistent with industry guidance. The staff will conduct followup reviews of the remaining 14 NPPs (see Table 1) to review Y2K-related activities that could not be addressed during the Y2K site reviews conducted by the staff in the April - June 1999 review period.
- Eighteen NPPs reported systems and/or components that had not been replaced or remediated by July 1, 1999, and could affect plant operations (see Table 2). The staff will verify completion of the remediation activities for these systems and components as they are completed.
- Seventeen NPPs reported systems and/or components that had not been replaced or remediated by July 1, 1999, and do not affect plant operations but require Y2K remediation (see Table 3). The staff will verify completion of the remediation activities for these systems and components as they are completed.
- As of July 1, 1999, 68 plants have reported being Y2K ready (see Table 4). All licensees are expected to be fully Y2K ready before the transition from 1999 to 2000.

The results of the staff reviews will be incorporated into the staff's final NUREG report of licensee Y2K readiness activities, which should be issued by August 31, 1999.

Table 1
Plants Requiring TI 2515/141 Followup Reviews

Plant	NRC Region	Areas to Be Reviewed During Followup
Beaver Valley 1 and 2	I	Detailed Assessment, Contingency Planning
Indian Point 2*	I	Detailed Assessment, Contingency Planning

Three Mile Island 1	I	Detailed Assessment
Vermont Yankee	I	Detailed Assessment, Contingency Planning
Summer*	II	Contingency Planning
Prairie Island 1 and 2*	III	Detailed Assessment, Contingency Planning
Arkansas 1 and 2*	IV	Contingency Planning
Cooper*	IV	Detailed Assessment, Contingency Planning
Grand Gulf*	IV	Detailed Assessment, Contingency Planning
River Bend*	IV	Detailed Assessment, Contingency Planning
Waterford*	IV	Contingency Planning

*Plants reporting Y2K Ready as of July 1, 1999

Table 2
Plants With One or More Systems and Components That Could Affect Plant Operations

Plant	Systems Requiring Remediation	Completion Date	Reason for Delay
Beaver Valley 1 and 2	Plant monitoring and trending computer* Atmospheric radioactive effluent release assessment system Emergency response data system Emergency response facility monitoring and trending computer	9/30/99	Remediation
Brunswick 1	Digital feedwater control system*	11/30/99	Outage dependent
Clinton	Core performance monitoring system* Station security system	9/22/99	Vendor delivery, site acceptance testing, and final installation
Comanche Peak 1	Condensate purification control system* Plant training simulator	11/30/99	Outage dependent
Diablo Canyon 1 and 2	Main annunciator system*	10/31/99	Outage dependent
Farley 2	Turbine electro-hydraulic control system*	12/16/99	Outage dependent
Hope Creek	Fire detection and alarm system* Safety parameter display system Emergency response data system Plant training simulator	10/29/99	Outage dependent
Limerick 2	Core performance monitoring system*	9/30/99	Remediation
Monticello	Core physics monitoring system*	9/1/99	Integrated testing
Peach Bottom 2	Core performance monitoring system*	9/30/99	Remediation

Peach Bottom 3	Digital feedwater control system* Core performance monitoring system* Turbine vibration monitoring system*	10/31/99	Outage dependent
Salem 1	Digital feedwater control system* Overhead annunciator system* Plant computer monitoring and alarm system* Safety parameter display system Emergency response data system Plant training simulator	11/6/99	Outage dependent
South Texas 1 and 2	Plant process computer system* Procurement and inventory control system	10/31/99	Ongoing projects to replace obsolescent systems independent of Y2K
Three Mile Island 1	Digital turbine control system* Personnel radiation exposure tracking system Personnel qualification tracking system	10/21/99	Outage dependent
Vermont Yankee	Plant process computer* Site security computer Refueling equipment control system	10/31/99	System on order; installation pending

*Systems that could affect plant operations

Table 3
Plants With Systems and Components That Do Not Affect Plant Operations

Plant	Systems Requiring Remediation	Completion Date	Reason for Delay
Browns Ferry 2 and 3	Site health physics information management system Site nuclear operations management system Site security check-in process software	10/31/99	Implementation
Comanche Peak 2	Plant training simulator	10/30/99	Remediation
Davis-Besse	Maintenance management system for surveillance tracking	8/ 1/99	Software modifications, testing, and implementation
D.C. Cook 1 and 2	Meteorological information and dispersion assessment system	12/15/99	Installation, test, and verification
North Anna 2	Steam generator blowdown control system	10/29/99	Design change development, installation, acceptance testing

Oyster Creek	Personnel qualification tracking system Personnel radiation exposure tracking system	9/30/99	Remediation
Perry	Meteorological monitoring system	8/ 1/99	Remediation
Sequoyah 1 and 2	Site health physics information management system Site nuclear operations management system Site security check-in process software	10/31/99	Implementation
St. Lucie 1 and 2	Health physics administrative computer system	7/15/99 (7/7/99)*	Replacement
Salem 2	Radiation monitoring system Safety parameter display system Emergency response data system Plant training simulator	10/29/99	Outage dependent
Turkey Point 3 and 4	Health physics administrative computer system	7/15/99 (7/11/99)*	Replacement
Watts Bar	Site health physics information management system Site nuclear operations management system Site security check-in process software	10/31/99	Implementation

* Telecon with licensee on 7/15/99 indicates that this item was completed on the date in parentheses

Table 4
Plants Reporting Y2K Readiness on July 1, 1999

Plant Name	**NRC Region**
Calvert Cliffs 1 and 2	I
Fitzpatrick	I
Ginna	I
Indian Point 2	I
Indian Point 3	I
Limerick 1	I
Millstone 2 and 3	I
Nine Mile Point 1 and 2	I
Pilgrim	I
Seabrook	I

Susquehanna 1 and 2	I
Brunswick 2	II
Catawba 1 and 2	II
Crystal River 3	II
Farley 1	II
Harris	II
Hatch 1 and 2	II
McGuire 1 and 2	II
North Anna 1	II
Oconee 1, 2 and 3	II
Robinson 2	II
Summer	II
Surry 1 and 2	II
Vogtle 1 and 2	II
Braidwood 1 and 2	III
Byron 1 and 2	III
Dresden 2 and 3	III
Duane Arnold	III
Fermi 2	III
Kewaunee	III
LaSalle 1 and 2	III
Palisades	III
Point Beach 1 and 2	III
Prairie Island 1 and 2	III
Quad Cities 1 and 2	III
Arkansas 1 and 2	IV
Callaway	IV
Cooper	IV
Fort Calhoun	IV
Grand Gulf	IV
Palo Verde 1, 2 and 3	IV
River Bend	IV
San Onofre 2 and 3	IV
Waterford 3	IV
Washington Nuclear 2	IV
Wolf Creek	IV

Summary of Licensee Reports On the Status of Y2K Readiness At Nuclear Power Plants

July 7, 1999

[NRC Year 2000 Page | NRC Home Page]

Plant	Completion Date	Status and/or Systems Requiring Remediation
ANO 1	Complete	Ready
ANO 2	Complete	Ready
Beaver Valley 1	9/30/99	(1) Plant monitoring and trending computer (2) Atmospheric radioactive effluent release assessment system (3) Emergency response data system
Beaver Valley 2	9/30/99	(1) Plant monitoring and trending computer (2) Atmospheric radioactive effluent release assessment system (3) Emergency response data system (4) Emergency response facility monitoring and trending computer
Braidwood 1	Complete	Ready
Braidwood 2	Complete	Ready
Browns Ferry 2	10/31/99	(1) Site health physics information management system (2) Site nuclear operations management system (3) Site security check-in process software
Browns Ferry 3	10/31/99	(1) Site health physics information management system (2) Site nuclear operations management system (3) Site security check-in process software
Brunswick 1	11/30/99	(1) Digital feedwater control system
Brunswick 2	Complete	Ready
Byron 1	Complete	Ready
Byron 2	Complete	Ready
Callaway	Complete	Ready
Calvert Cliffs 1	Complete	Ready
Calvert Cliffs 2	Complete	Ready
Catawba 1	Complete	Ready
Catawba 2	Complete	Ready

Clinton	9/22/99	(1) Station security system (2) Core performance monitoring system
Comanche Pk 1	11/30/99	(1) Condensate purification control system (2) Plant training simulator
Comanche Pk 2	10/30/99	(1) Plant training simulator
Cooper	Complete	Ready
Crystal River 3	Complete	Ready
Davis-Besse	8/1/99	(1) Maintenance management system for surveillance tracking
D.C. Cook 1	12/15/99	(1) Meteorological information and dispersion assessment system
D.C. Cook 2	12/15/99	(1) Meteorological information and dispersion assessment system
Diablo Canyon 1	10/31/99	(1) Main annunciator system
Diablo Canyon 2	10/31/99	(1) Main annunciator system
Dresden 2	Complete	Ready
Dresden 3	Complete	Ready
Duane Arnold	Complete	Ready
Farley 1	Complete	Ready
Farley 2	12/16/99	(1) Turbine electro-hydraulic control system
Fermi 2	Complete	Ready
Fitzpatrick	Complete	Ready
Fort Calhoun	Complete	Ready
Ginna	Complete	Ready
Grand Gulf	Complete	Ready
Harris	Complete	Ready
Hatch 1	Complete	Ready
Hatch 2	Complete	Ready
Hope Creek	10/29/99	(1) Fire detection and alarm system (2) Safety parameter display system (3) Emergency response data system (4) Plant training simulator
Indian Point 2	Complete	Ready
Indian Point 3	Complete	Ready
Kewaunee	Complete	Ready
La Salle 1	Complete	Ready
La Salle 2	Complete	Ready
Limerick 1	Complete	Ready
Limerick 2	9/30/99	(1) Core performance monitoring system
McGuire 1	Complete	Ready
McGuire 2	Complete	Ready
Millstone 2	Complete	Ready
Millstone 3	Complete	Ready
Monticello	9/1/99	(1) Core physics monitoring system

Nine Mile Pt 1	Complete	Ready
Nine Mile Pt 2	Complete	Ready
North Anna 1	Complete	Ready
North Anna 2	10/29/99	(1) Steam generator blowdown control system (2) Steam generator blowdown radiation monitor
Oconee 1	Complete	Ready
Oconee 2	Complete	Ready
Oconee 3	Complete	Ready
Oyster Creek	9/30/99	(1) Personnel qualification tracking system (2) Personnel radiation exposure tracking system
Palisades	Complete	Ready
Palo Verde 1	Complete	Ready
Palo Verde 2	Complete	Ready
Palo Verde 3	Complete	Ready
Peach Bottom 2	9/30/99	(1) Core performance monitoring system
Peach Bottom 3	10/31/99	(1) Digital feedwater control system (2) Core performance monitoring system (3) Turbine vibration monitoring system
Perry	8/1/99	(1) Meteorological monitoring system
Pilgrim	Complete	Ready
Point Beach 1	Complete	Ready
Point Beach 2	Complete	Ready
Prairie Island 1	Complete	Ready
Prairie Island 2	Complete	Ready
Quad Cities 1	Complete	Ready
Quad Cities 2	Complete	Ready
River Bend	Complete	Ready
Robinson	Complete	Ready
Salem 1	11/6/99	(1) Plant computer monitoring and alarm system (2) Digital feedwater control system (3) Overhead annunciator system (4) Safety parameter display system (5) Emergency response data system (6) Plant training simulator
Salem 2	10/29/99	(1) Radiation monitoring system (2) Safety parameter display system (3) Emergency response data system (4) Plant training simulator

San Onofre 2	Complete	Ready
San Onofre 3	Complete	Ready
Seabrook	Complete	Ready
Sequoyah 1	10/31/99	(1) Site health physics information management system (2) Site nuclear operations management system (3) Site security check-in process software
Sequoyah 2	10/31/99	(1) Site health physics information management system (2) Site nuclear operations management system (3) Site security check-in process software
South Texas 1	10/31/99	(1) Procurement and inventory control system (2) Plant process computer system
South Texas 2	10/31/99	(1) Procurement and inventory control system (2) Plant process computer system
St. Lucie 1	7/15/99	(1) Health physics administrative computer system
St. Lucie 2	7/15/99	(1) Health physics administrative computer system
Summer	Complete	Ready
Surry 1	Complete	Ready
Surry 2	Complete	Ready
Susquehanna 1	Complete	Ready
Susquehanna 2	Complete	Ready
TMI	10/21/99	(1) Digital turbine control system (2) Personnel radiation exposure tracking system (3) Personnel qualification tracking system
Turkey Point 3	7/15/99	(1) Health physics administrative computer system
Turkey Point 4	7/15/99	(1) Health physics administrative computer system
Vermont Yankee	10/31/99	(1) Site security computer (2) Plant process computer (3) Refueling equipment control system
Vogtle 1	Complete	Ready
Vogtle 2	Complete	Ready
WNP 2	Complete	Ready
Waterford	Complete	Ready
Watts Bar	10/31/99	(1) Site health physics information management system (2) Site nuclear operations management system (3) Site security check-in process software
Wolf Creek	Complete	Ready

Y2K REVIEW CHECKLIST FOR TEMPORARY INSTRUCTION 2515/141 (IPE = SI)

The purpose of this checklist is to guide the review of licensee Y2K program activities designed to achieve Y2K readiness in accordance with GL 98-01 or GL 98-01 Supplement 1.

In performing this review, the reviewer should recognize the important role an independent reviewer provides to successful completion of the licensee's Y2K program. Often, the licensee may be highly focused on remediating individual software applications or embedded components, and may not have a comprehensive overall view of their process. The reviewer provides that viewpoint and, consequently, may discover inconsistencies in the licensee's project implementation that would not have been discovered by the licensee until much later. One of the most important functions of the reviewer, therefore, is to discover these inconsistencies and bring them to the licensee's attention in a timely manner. An example report suitable for distribution to the licensee is shown in Attachment B. This report was prepared using a Corel WP 8 macro (verify.wcm), which is available from Michael Waterman, at NRC.

The materials required for this review include: (1) the licensee's Y2K project plan; (2) licensee status reports and tracking reports; (3) an inventory listing of the licensee's software applications and embedded components; (4) the licensee's Y2K documentation packages for the software systems and embedded components that will be used in this review; (5) Contingency plan documentation; (6) Supporting licensee documentation, as required; (7) NEI/NUSMG 97-07 (http://www.nei.org/library/97-07.pdf); (8) NEI/NUSMG 98-07 (http://www.nei.org/library/98-07.pdf); (9) GL 98-01 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001.html); and (10) GL 98-01, Suppl 1 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001s1.html).

The questions to be answered are printed in **boldface** type. Supporting information related to the questions is printed in normal type. References to supporting sources of information are provided in *italicized* type. If using the electronic version of this checklist, open the checklist in Corel WP 8. The answer blocks are formatted so that the Reviewer's answers appear in Redline format.

All table cells other than the entry cells for **Plant Name**, **Docket Number, Licensee Name, Reviewer's Name, Date, Software Application/ Embedded Component Name, Lic. Pkg Number, YES, NO,** and **N/A** cells have been locked to ease use of the checklist electronically. To preserve the format of the checklist for later processing, **do not turn off the cell locks**.

Place an '**X**' in the appropriate box for each of the following questions. If a checklist answer is **NO**, but the associated issue is resolved through discussions with the licensee or because the licensee addresses the issue appropriately elsewhere in its Y2K program, place an '**X**' below the **YES** and the delete the **'X'** from below the **NO**. There must be only one **X'** for each question. Do not answer a question if it is not reviewed (**NR**). If supporting comments are necessary, provide these comments (referenced by question number) at the bottom of the checklist.

To assist the Reviewer in finding the major sections of this checklist, Bookmarks have been created for the major sections of the checklist and this set of General instructions. To access this list of Bookmarks, use the **Tools** drop down menu at the top of the screen, and select the **Bookmark...** option. The list of bookmarks will be displayed. Select the desired Bookmark from the list, and the cursor will be placed at the first question. To create a temporary bookmark, select the **Set Quickmark**

option. To return to the **Quickmark** location, select the **Find Quickmark** option.

Use a copy of this checklist file for answering the questions, **SAVE YOUR WORK OFTEN**, and **BACK UP YOUR WORK** on the hard disk and a different floppy disk.

Use of the electronic version of this checklist is recommended. A Corel WP 8 macro (Verify.wcm) has been developed to process the checklist question answers, and to prepare a summary report of the reviewer's answers. In processing the answers, the macro translates each Reviewer answer into the corresponding **Y**, **N**, **N/A**, **NR**, or **??** (for more than one block checked), and places the answer in the right column of the checklist. The cells in the right column are color coded according to the answers entered by the Reviewer. Green is for **YES**, Red is for **NO**, White is for **N/A**, Yellow is for **NR**, and Blue is for **??** (Reviewer input data error). Additionally, for Reviewer input data errors, the left three columns are also colored Blue to aid the Reviewer in finding the boxes. To see the colored cells, toggle View Table Gridlines off.

The summary listing is created in a New file, and provides the Reviewer with a breakdown by answers of each question response option (**Y**, **N**, **N/A**, **NR**, or **??**). The Reviewer may use this summary listing to find data input errors and questions that have not been reviewed. The summary listing also provides a boiler plate report that describes the results of the review by Y2K activity area, (Management Planning, Documentation, Implementation Plans, Initial Assessment, etc.).

The Corel WP 8 Verify.wcm file should be copied into the default Corel macro file folder, WPWin. To use the macro, the Y2K review checklist should be the current document, and the Table cells should be locked (not Disable-d). Run the verify macro from the Tools Macro Play drop down menu. Verify may be rerun as often as the Reviewer chooses.

The WP 8 document, "Instruct.wpd,"provides more detailed instructions for using this checklist and the processing macro, verify."

Questions regarding this review checklist and the supporting macro should be directed to:

Michael E. Waterman, US NRC, Washington, DC 20555, e-mail: mew1 , or call (301) 415-2818.

For multi-unit sites, enter only one Docket number. **Docket Number 50-** _____

Plant? _____

Licensee? _____

Reviewer? _____ **Date?** _____

MANAGEMENT PLANNING *NEI/NUSMG 97-07, §4*

YES	NO	N/A

1 **Has senior management been actively involved in informing their personnel about the vulnerability of their utility to Y2K issues?** This may be determined by reviewing senior management announcements regarding Y2K activities and commitments. Senior management's attention to the Y2K problem indicates their commitment to maintaining the margin of safety and the operability of their facilities. NR

NEI/NUSMG 97-07, §4.1

YES	NO	N/A

2 **Is the Y2K Project Sponsor a Senior Manager?** (e.g., Chief Nuclear Officer, Vice President of Nuclear Engineering, or Vice President of Nuclear Operations). The Y2K project requires significant commitments of personnel, facilities, and funds. The project also requires support between organizations within the utility. These resources are typically authorized by senior management. NR

NEI/NUSMG 97-07, §4.2

The project sponsor should be actively engaged in the oversight of the project. This involvement may be supplemented by outside organizations that provide oversight of the project. Meeting Y2K project milestones indicates a commitment by the licensee to address Y2K issues. The auditor may use slipped schedules as an indicator for determining senior management involvement in the Y2K project. If there are one or two slipped milestones early in the project, and all other milestones have been met, the likely cause is increased awareness and personal attention by senior management. If slipped schedules are common throughout the project life, this is a symptom that senior management may not be aware of Y2K vulnerabilities at the facility or may not be actively involved in the Y2K project. The following two questions address project sponsor participation.

YES	NO	N/A

3 **Has the Y2K project met all of its Y2K Project milestones?** This may be determined by reviewing project status reports comparing actual progress with project milestones. These status reports are usually maintained by the Y2K Project Manager. NR

NEI/NUSMG 97-07, §4.2, 4.3

YES	NO	N/A

4 **If the Y2K Project team did miss a milestone, did licensee senior management (i.e., the Y2K Project Sponsor or Y2K Project Owner) respond with corrective actions?** There may not be any documentation confirming this response; however, the answer to this question may be obtained through discussions with the Y2K Project Manager about past schedule slippages and senior management's response. NR

NEI/NUSMG 97-07, §4.2, 4.3

YES	NO	N/A			
			5	**Has the licensee committed sufficient resources for this project?** Typically, licensees have been committing 15-25 FTEs for their Y2K projects. These people may be assigned to the project on a full time basis, or may be assigned as needed. Committing less than 15 FTEs indicates senior management may not be fully aware of their facility's vulnerability to Y2K problems. A single nuclear power plant will have approximately 700 applications and embedded components that have potential Y2K vulnerabilities. Detailed assessment of this many applications and embedded components requires a significant commitment of personnel, equipment, and funding resources. *NEI/NUSMG 97-07, §4.2, NRC experience*	NR
			6	**Is the Y2K Project Manager a full time position?** Assigning project management as a part time position indicates senior management may not be fully aware of the scope of their facility's vulnerability to Y2K problems. *NEI/NUSMG 97-07, §4.3*	NR
			7	**Has the project manager documented the project sponsor's expectations concerning the major objectives of the project?** The project manager and project sponsor must understand the objectives of the project to address Y2K vulnerabilities effectively. This documentation may be in the form of a memorandum of understanding or a task order to create a Y2K project. *NEI/NUSMG 97-07, §4.4*	NR
			8	**Has the project manager obtained written agreement from the project sponsor regarding the project objectives and the approach to be taken?** The project sponsor should have approved the documented understanding. If the project sponsor has not approved the understanding about the project objectives, this could impact project schedules and milestones negatively. *NEI/NUSMG 97-07, §4.4*	NR
			9	**Is there appropriate expertise on the project team for addressing each Y2K problem?** Licensee's typically use system owners, subject matter experts (SMEs), information technology professionals, and personnel from support organizations such as engineering and licensing. Some licensees also use consultants and contractors. Use of this diverse set of personnel ensures that each system and application is addressed appropriately. Subject matter experts are often system engineers, senior engineers, or personnel directly involved in the operation and maintenance of a system or piece of equipment. Consultants and contractors are often employed to perform testing and remediation activities, or to assist in developing the inventory of software applications and embedded components requiring remediation. *NEI/NUSMG 97-07, §4.5*	NR
			10	**Does the licensee have a project management plan that documents the approach to be used to address Y2K issues at the facility?** A project management plan indicates a commitment by the licensee to fully address Y2K issues in a systematic manner. This question leads into the following set of questions regarding the licensee's approach to resolving Y2K problems at the facility. *NEI/NUSMG 97-07, §4.6*	NR
			11	**Does the management plan describe the strategies used to address or establish:** *NEI/NUSMG 97-07, §4.6*	
			11a.	**Ownership of software changes?** Software changes should be controlled through the licensee's software configuration management plan.	NR
			11b.	**Vendor relationships and responsibilities?**	NR

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YES	NO	N/A			
			11c.	**Communication and feedback from affected parties?**	NR
			11d.	**Contingency plans for unanticipated events during the date rollover into January 1, 2000?**	NR
			12	**Does the project manager provide status reports to the project sponsor and other members of management?** These reports should include details of key performance indicators such as numbers of systems addressed, expenditures, the current disposition of resources in the field, and schedule status. *NEI/NUSMG 97-07, §4.7*	NR
			13	**Does management receive status reports on a monthly or more frequent interval?** For example, providing a semiannual status report of Y2K activities to upper management would not be appropriate because additional resources (for example) could not be allocated in a timely manner. *NEI/NUSMG 97-07, §4.7*	NR
			14	**Has the project manager established interfaces to other organizations (electric utilities, telecommunications utilities, suppliers, emergency services, government offices, etc) that could affect the objectives of the Y2K project?** *NEI/NUSMG 97-07, §4.8*	NR
			15	**Is each of the interfaces addressed to ensure that the responsible organization is also addressing Y2K problems appropriately?** *NEI/NUSMG 97-07, §4.8*	NR
			16	Quality assurance measures should be applied throughout the Y2K effort to include both the management and the implementation activities. These measures should be structured to ensure that the performance of essential activities is supported by objective evidence. **Do the licensee's measures ensure:** *NEI/NUSMG 97-07, §4.11*	
			16a.	**Personnel participating in the Y2K project are qualified for the assigned tasks?**	NR
			16b.	**Activities that could affect safety or operability are accomplished using appropriate procedures?**	NR
			17	**Is the project on schedule to be completed by July 1, 1999?** This can be determined by reviewing the Project Performance Reports. It is likely the project is not on schedule if the project milestones are not being met. *NRC GL 98-01*	NR
			18	**If the project is not on schedule, has the licensee taken actions to get back on schedule?** These actions may or may not have required senior management involvement. *NRC GL 98-01*	NR

DOCUMENTATION

Documentation of Y2K program activities serves several important purposes:

- Provide management's expectations and guidance on the conduct of the project,
- Collect the data needed to monitor and manage the progress of the project,
- Allow independent parties to review the project during and after completion,
- Record the basis of the ready or compliance certification.
- Record the justification for leaving an application "as-is" but neither compliant or ready, and
- Record utility management and technical decisions in the event of litigation.

NEI/NUSMG 97-07 §8

YES	NO	N/A			
			20	**Did the licensee use existing software quality assurance (SQA) and configuration management procedures as primary records of change control?** *NEI/NUSMG 97-07 §8*	NR

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Documentation Requirements

YES	NO	N/A			
			21	**Did the licensee record the disposition of each item in their inventory?** *NEI/NUSMG 97-07 §8.1*	NR

22 Do the records support: *NEI/NUSMG 97-07 §8.1*

YES	NO	N/A			
			22a.	**Information retrieval activities?**	NR
			22b.	**Auditing activities?**	NR
			22c.	**Oversight activities?**	NR

Checklists for Initial and Detailed Assessments *NEI/NUSMG 97-07 §8.5*

YES	NO	N/A			
			23	**For each software application and embedded component, did the licensee use checklists indicating progress through each step in the Y2K project?** *NEI/NUSMG 97-07 §8.5*	NR
			24	**Was the checklist reviewed and completed by the business subject matter expert and the technical team members who were responsible for supporting the item?** *NEI/NUSMG 97-07 §8.5*	NR
			25	**Is the checklist structured such that the responsible persons are led through the entire process in a manner that helps them properly evaluate the items and record their responses and comments to specific questions?** *NEI/NUSMG 97-07 §8.5 & Appendix H*	NR

IMPLEMENTATION PLANS The project team should have developed a project plan that defines the process and methods used to implement the requirements of the management plan. The implementation plans for the project should be approved by appropriate levels of management (e.g., project manager and project sponsor). The project plan should address awareness activities, initial assessment activities, detailed assessment activities, remediation activities, Y2K testing and validation activities, and notification activities. Existing licensee quality assurance measures should be applied to all activities. The following questions address these activities.

NEI/NUSMG 97-07, §5

Awareness

30 The purpose of initial communications is to raise general awareness of the issue and to communicate its importance to the organization. The communication or indoctrination must be aligned to the audience. *NEI/NUSMG 97-07, §5.1*

Does the licensee's audience include:

YES	NO	N/A			
			30a.	**Management?**	NR
			30b.	**Subject matter experts?**	NR
			30c.	**System engineers?**	NR
			30d.	**Software or system sponsors?**	NR
			30e.	**General employees?**	NR
			30f.	**Support organizations such as procurement and engineering programs?**	NR

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31 In carrying out the Communications plan, did the licensee describe:

NEI/NUSMG 97-07, §5.1

YES	NO	N/A			
			31a.	**The Y2K problem?**	NR
			31b.	**The process or plans to address and remediate Y2K problems?**	NR
			31c.	**The significance or priority of the problem?**	NR
			31d.	**The resources and schedule?**	NR

INITIAL ASSESSMENT

NEI/NUSMG 97-07, §5.2

Inventory. In the initial assessment phase, the licensee identifies software and embedded systems in use by the plant. The initial assessment consists of performing an inventory, screening for Y2K impact, categorizing the inventoried items, classifying the items to reflect their importance, prioritizing the items for detailed assessment, and performing an analysis of the initial assessment to determine the scope, schedule, and estimated resources required for the detailed assessment.

NEI/NUSMG 97-07, §5.2.1

YES	NO	N/A			
			40	**Does the licensee maintain a record of each inventoried item?** The licensee should be maintaining an inventory in some form of a database that provides a record of software application or embedded component name, version or model number, description and use, priority based on importance to safety, operability, regulatory commitments, business considerations, etc., vendor or manufacturer, and owner or support group responsible for the item. *NEI/NUSMG 97-07, §5.2.1*	NR

41 In developing the inventory, did the licensee: *NEI/NUSMG 97-07, §5.2.1*

YES	NO	N/A			
			41a.	**Search procedures and documentation for the occurrence of phrases that would indicate the existence of an internal clock or processor?**	NR
			41b.	**Survey vendors for information about their equipment?**	NR
			41c.	**Perform system walkdowns?**	NR
			41d.	**Review schematics, program listings, and reference manuals?**	NR

42 Does the licensee's guidance for performing the inventory include:

NEI/NUSMG 97-07, §5.2.1

YES	NO	N/A			
			42a.	**The types of items to list?**	NR
			42b.	**The use of existing inventories?**	NR
			42c.	**Information required for future actions and decisions?**	NR

Categorization *NEI/NUSMG 97-07, §5.2.2*

YES	NO	N/A			
			43	**Did the licensee categorize the inventoried software and embedded systems equipment?** Categorization is the process that groups software and embedded systems to allow management to assign resources to the classification and prioritization activities. Examples of categories are mainframe applications, system software, client/server applications, telecommunications equipment, process systems equipment, test equipment, and software interfaces. *NEI/NUSMG 97-07, §5.2.2*	NR

Classification

44 After the inventory is categorized, each item within each category should be classified to reflect the importance of the item. Without some form of classification methodology, the licensee may not be able to perform detailed assessment activities for the most important items before the June 30, 1999, deadline. **Does the licensee's classification process address classifications such as:**

NEI/NUSMG 97-07, §5.2.3

YES	NO	N/A			
			44a.	**Safety-related?**	NR
			44b.	**Important-to-safety?**	NR
			44c.	**Regulatory requirements?**	NR
			44d.	**Licensee commitments?**	NR
			44e.	**Important to operations?**	NR
			44f.	**Personnel safety?**	NR
			44g.	**Continuity of business?**	NR
			44h.	**Non-essential?**	NR

Prioritization Prioritization is the process of reviewing all items within the inventory after classification and assigning an order to the performance of the detailed assessment. Examples of prioritization criteria are risk, the number of systems of a given type, the availability of personnel with the required experience, and competing schedules such as equipment replacement and outages.

NEI/NUSMG 97-07, §5.2.4

YES	NO	N/A			
			45	**Did the licensee describe in their project plan the criteria to be used to prioritize detailed assessment activities?** *NEI/NUSMG 97-07, §5.2.4*	NR

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CONFIRMATION OF Y2K PROJECT IMPLEMENTATION ACTIVITIES

In the following identical sets questions, the reviewer should use as a basis for their review a remediated application or embedded component from the reactor protection system or engineered safety features systems (RPS/ESF), the feedwater system or the balance of plant systems (FWS/BOP), the radiation monitoring system (RMS), the emergency sirens (ENS), the plant process computer (PPC), and the plant security system (PSS). It is recognized that some reactor protection systems may not have any software applications or embedded components that process date-related information. However, the RPS was included here because of its importance to safety.

Most licensee's maintain a list of software applications and embedded components in an electronic database. Request a printed copy of this database, an electronic copy of the database in a format supported by the NRC, or request read-only access to the database. Using the database, select a software application or embedded component for each of the above named applications (i.e., RPS/ESF, FWS/BOP, RMS, ENS, PPC, and PSS). The selected software applications and embedded components should have been determined by the licensee to be Y2K susceptible. The associated remediation activities should have been completed, and the software applications and embedded components should be declared Y2K ready or compliant. The reviewer should then request from the Y2K Project Manager all of the Y2K package documentation for each of the software applications and embedded components selected.

As an initial check, ensure the documentation in the package is consistent with the documentation required in the licensee's Y2K Project Plan. Many project plans provide a list of deliverables for each software application and embedded component package. Use this list to facilitate the cross check.

Once you've verified the package is complete, proceed to the following questions.

REACTOR PROTECTION SYSTEM OR ENGINEERED SAFETY SYSTEM SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software/Component Name? _____

Lic. Pkg Number? _____

RPS/ESF INITIAL ASSESSMENT

YES	NO	N/A			
			100	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*	NR

RPS/ESF Analysis of Initial Assessment

YES	NO	N/A			
			101	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*	NR

RPS/ESF DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A			
			120	**Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. *NEI/NUSMG 97-07, §5.3*	NR

RPS/ESF Evaluations by Vendor: Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A			
			121	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			122	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			123	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*	NR
			124	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*	NR

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RPS/ESF Owned or Supported by Utility *NEI/NUSMG 97-07, §5.3.2*

YES	NO	N/A			
			125	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*	NR
			126	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*	NR

Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*

YES	NO	N/A			
			127	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*	NR

RPS/ESF Remediation Planning *NEI/NUSMG 97-07, §5.3.4*

YES	NO	N/A			
			128	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*	NR
			129	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*	
			129a.	**Options evaluated?**	NR
			129b.	**Schedule?**	NR
			129c.	**Benefits?**	NR
			129d.	**Risks?**	NR

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RPS/ESF REMEDIATION. The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase.

140 Did the licensee: *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A			
			140a.	**Track the progress of the remediation activity?**	NR
			140b.	**Document the risk evaluation?**	NR
			140c.	**Follow existing software quality assurance procedures?**	NR
			140d.	**Follow existing station modification procedures?**	NR
			140e.	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*	NR

RPS/ESF Contingency Plan

YES	NO	N/A			
			141	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*	NR

142 Did the contingency plan include: *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A			
			142a.	**An inventory number or other unique identifier?**	NR
			142b.	**A description of the risk?**	NR
			142c.	**Identification of the subject matter expert?**	NR
			142d.	**Event analysis?**	NR
			142e.	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**	NR
			142f.	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.	NR

YES	NO	N/A			
			142g.	**Period of vulnerability?**	NR
			142h.	**Priority?**	NR
			142i.	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.	NR
			142j.	**Resources?**	NR
			142k.	**Implementation timing?**	NR
			142l.	**If needed, an exit strategy?**	NR
			142m.	**Training requirements?**	NR
			142n.	**Requirements for special Y2K procedures?**	NR
			142o.	**Identification and documentation of verification?**	NR
			142p.	**Management approval?**	NR
			143	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*	NR

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RPS/ESF Y2K TESTING AND VALIDATION. The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component. *NEI/NUSMG 97-07, §5.5*

YES	NO	N/A			
			160	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 97-07, §5.5*	NR
			161	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 97-07, §5.5, Appendix E*	
			161a.	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.	NR
			161b.	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YYYY, or any of the other common formats currently used that incorporate date, month, and year.	NR
			161c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.	NR
			161d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.	NR
			161e.	**Year 2000 Rollover Gregorian Cold?**	NR
			161f.	**Year 2000 Julian Rollover Cold?**	NR
			161g.	**Year 2000 Leap Year Rollover Warm?**	NR
			161h.	**Year 2000 Leap Year Rollover Gregorian Warm?**	NR

YES	NO	N/A			
			161i.	**Year 2000 Leap Year Rollover Julian Warm?**	NR
			161j.	**Year 2000 Leap Year Rollover Cold?**	NR
			161k.	**Year 2000 Leap Year Rollover Gregorian Cold?**	NR
			161l.	**Year 2000 Leap Year Rollover Julian Cold?**	NR
			161m.	**High Risk Date 9/9/99?**	NR
			161n.	**Date Integrity 2/29/01?**	NR
			162	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*	NR
			163	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*	NR
				RPS/ESF NOTIFICATION *NEI/NUSMG 97-07 §5.6*	
			180	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*	NR
			181	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*	NR

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FEEDWATER SYSTEM OR BALANCE OF PLANT SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software/Component Name? _____

Lic. Pkg Number? _____

FWS/BOP INITIAL ASSESSMENT

YES	NO	N/A			
			200	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*	NR

FWS/BOP Analysis of Initial Assessment

YES	NO	N/A			
			201	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*	NR

FWS/BOP DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A			
			220	**Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. *NEI/NUSMG 97-07, §5.3*	NR

FWS/BOP Evaluations by Vendor: Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A			
			221	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			222	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			223	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*	NR
			224	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*	NR

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FWS/BOP Owned or Supported by Utility *NEI/NUSMG 97-07, §5.3.2*

YES	NO	N/A			
			225	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*	NR
			226	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*	NR

Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*

YES	NO	N/A			
			227	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*	NR

FWS/BOP Remediation Planning *NEI/NUSMG 97-07, §5.3.4*

YES	NO	N/A			
			228	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*	NR
			229	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*	
YES	NO	N/A	229a.	**Options evaluated?**	NR
YES	NO	N/A	229b.	**Schedule?**	NR
YES	NO	N/A	229c.	**Benefits?**	NR
YES	NO	N/A	229d.	**Risks?**	NR

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FWS/BOP REMEDIATION. The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase.

240 Did the licensee: *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A			
			240a.	**Track the progress of the remediation activity?**	NR
			240b.	**Document the risk evaluation?**	NR
			240c.	**Follow existing software quality assurance procedures?**	NR
			240d.	**Follow existing station modification procedures?**	NR
			240e.	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*	NR

FWS/BOP Contingency Plan

YES	NO	N/A			
			241	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*	NR

242 Did the contingency plan include: *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A			
			242a.	**An inventory number or other unique identifier?**	NR
			242b.	**A description of the risk?**	NR
			242c.	**Identification of the subject matter expert?**	NR
			242d.	**Event analysis?**	NR
			242e.	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**	NR
			242f.	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.	NR

YES	NO	N/A			
			242g.	**Period of vulnerability?**	NR
			242h.	**Priority?**	NR
			242i.	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.	NR
			242j.	**Resources?**	NR
			242k.	**Implementation timing?**	NR
			242l.	**If needed, an exit strategy?**	NR
			242m.	**Training requirements?**	NR
			242n.	**Requirements for special Y2K procedures?**	NR
			242o.	**Identification and documentation of verification?**	NR
			242p.	**Management approval?**	NR
			243	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*	NR

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FWS/BOP Y2K TESTING AND VALIDATION. The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component. *NEI/NUSMG 97-07, §5.5*

YES	NO	N/A			
			260	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 97-07, §5.5*	NR
			261	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 97-07, §5.5, Appendix E*	
			261a.	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.	NR
			261b.	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YYYY, or any of the other common formats currently used that incorporate date, month, and year.	NR
			261c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.	NR
			261d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.	NR
			261e.	**Year 2000 Rollover Gregorian Cold?**	NR
			261f.	**Year 2000 Julian Rollover Cold?**	NR
			261g.	**Year 2000 Leap Year Rollover Warm?**	NR
			261h.	**Year 2000 Leap Year Rollover Gregorian Warm?**	NR

YES	NO	N/A			
			261i.	**Year 2000 Leap Year Rollover Julian Warm?**	NR
			261j.	**Year 2000 Leap Year Rollover Cold?**	NR
			261k.	**Year 2000 Leap Year Rollover Gregorian Cold?**	NR
			261l.	**Year 2000 Leap Year Rollover Julian Cold?**	NR
			261m.	**High Risk Date 9/9/99?**	NR
			261n.	**Date Integrity 2/29/01?**	NR
			262	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*	NR
			263	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*	NR
				FWS/BOP NOTIFICATION *NEI/NUSMG 97-07 §5.6*	
			280	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*	NR
			281	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*	NR

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RADIATION MONITORING SYSTEM SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software/Component Name? _____

Lic. Pkg Number? _____

RMS INITIAL ASSESSMENT

YES	NO	N/A			
			300	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*	NR

RMS Analysis of Initial Assessment

YES	NO	N/A			
			301	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*	NR

RMS DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A			
			320	**Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. *NEI/NUSMG 97-07, §5.3*	NR

RMS Evaluations by Vendor: Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A			
			321	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			322	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			323	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*	NR
			324	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*	NR

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RMS Owned or Supported by Utility *NEI/NUSMG 97-07, §5.3.2*

YES	NO	N/A			
			325	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*	NR
			326	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*	NR

Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*

YES	NO	N/A			
			327	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*	NR

RMS Remediation Planning *NEI/NUSMG 97-07, §5.3.4*

YES	NO	N/A			
			328	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*	NR
			329	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*	
			329a.	**Options evaluated?**	NR
			329b.	**Schedule?**	NR
			329c.	**Benefits?**	NR
			329d.	**Risks?**	NR

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RMS REMEDIATION. The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase.

340 Did the licensee: *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A			
			340a.	**Track the progress of the remediation activity?**	NR
			340b.	**Document the risk evaluation?**	NR
			340c.	**Follow existing software quality assurance procedures?**	NR
			340d.	**Follow existing station modification procedures?**	NR
			340e.	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*	NR

RMS Contingency Plan

YES	NO	N/A			
			341	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*	NR

342 Did the contingency plan include: *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A			
			342a.	**An inventory number or other unique identifier?**	NR
			342b.	**A description of the risk?**	NR
			342c.	**Identification of the subject matter expert?**	NR
			342d.	**Event analysis?**	NR
			342e.	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**	NR
			342f.	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.	NR

YES	NO	N/A			
			342g.	**Period of vulnerability?**	NR
			342h.	**Priority?**	NR
			342i.	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.	NR
			342j.	**Resources?**	NR
			342k.	**Implementation timing?**	NR
			342l.	**If needed, an exit strategy?**	NR
			342m.	**Training requirements?**	NR
			342n.	**Requirements for special Y2K procedures?**	NR
			342o.	**Identification and documentation of verification?**	NR
			342p.	**Management approval?**	NR
			343	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*	NR

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RMS Y2K TESTING AND VALIDATION. The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component. *NEI/NUSMG 97-07, §5.5*

YES	NO	N/A			
			360	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 97-07, §5.5*	NR
			361	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 97-07, §5.5, Appendix E*	
			361a.	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.	NR
			361b.	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YYYY, or any of the other common formats currently used that incorporate date, month, and year.	NR
			361c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.	NR
			361d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.	NR
			361e.	**Year 2000 Rollover Gregorian Cold?**	NR
			361f.	**Year 2000 Julian Rollover Cold?**	NR
			361g.	**Year 2000 Leap Year Rollover Warm?**	NR
			361h.	**Year 2000 Leap Year Rollover Gregorian Warm?**	NR

YES	NO	N/A			
			361i.	**Year 2000 Leap Year Rollover Julian Warm?**	NR
			361j.	**Year 2000 Leap Year Rollover Cold?**	NR
			361k.	**Year 2000 Leap Year Rollover Gregorian Cold?**	NR
			361l.	**Year 2000 Leap Year Rollover Julian Cold?**	NR
			361m.	**High Risk Date 9/9/99?**	NR
			361n.	**Date Integrity 2/29/01?**	NR
			362	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*	NR
			363	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*	NR
				RMS NOTIFICATION *NEI/NUSMG 97-07 §5.6*	
			380	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*	NR
			381	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*	NR

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EMERGENCY NOTIFICATION SYSTEMS SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software/Component Name? _____

Lic. Pkg Number? _____

ENS INITIAL ASSESSMENT

YES NO N/A

400 For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units? Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience* NR

ENS Analysis of Initial Assessment

YES NO N/A

401 Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment? *NEI/NUSMG 97-07, §5.2.5* NR

ENS DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES NO N/A

420 Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process? The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. *NEI/NUSMG 97-07, §5.3* NR

ENS Evaluations by Vendor: Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates. *NEI/NUSMG 97-07, §5.3.1*

YES NO N/A

421 Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor? *NEI/NUSMG 97-07, §5.3.1* NR

YES NO N/A

422 Did the licensee provide a generic Y2K compliance specification to the vendor? *NEI/NUSMG 97-07, §5.3.1* NR

YES NO N/A

423 Does the licensee intend to use the generic specification in future purchases of this software application or embedded component? Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1* NR

YES NO N/A

424 Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List? Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1* NR

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ENS Owned or Supported by Utility *NEI/NUSMG 97-07, §5.3.2*

YES	NO	N/A			
			425	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*	NR
			426	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*	NR

Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*

YES	NO	N/A			
			427	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*	NR

ENS Remediation Planning *NEI/NUSMG 97-07, §5.3.4*

YES	NO	N/A			
			428	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*	NR
			429	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*	
			429a.	**Options evaluated?**	NR
			429b.	**Schedule?**	NR
			429c.	**Benefits?**	NR
			429d.	**Risks?**	NR

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ENS REMEDIATION. The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase.

440 Did the licensee: *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A			
			440a.	**Track the progress of the remediation activity?**	NR
			440b.	**Document the risk evaluation?**	NR
			440c.	**Follow existing software quality assurance procedures?**	NR
			440d.	**Follow existing station modification procedures?**	NR
			440e.	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*	NR

ENS Contingency Plan

YES	NO	N/A			
			441	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*	NR

442 Did the contingency plan include: *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A			
			442a.	**An inventory number or other unique identifier?**	NR
			442b.	**A description of the risk?**	NR
			442c.	**Identification of the subject matter expert?**	NR
			442d.	**Event analysis?**	NR
			442e.	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**	NR
			442f.	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.	NR

YES	NO	N/A			
			442g.	**Period of vulnerability?**	NR
			442h.	**Priority?**	NR
			442i.	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.	NR
			442j.	**Resources?**	NR
			442k.	**Implementation timing?**	NR
			442l.	**If needed, an exit strategy?**	NR
			442m.	**Training requirements?**	NR
			442n.	**Requirements for special Y2K procedures?**	NR
			442o.	**Identification and documentation of verification?**	NR
			442p.	**Management approval?**	NR
			443	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*	NR

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ENS Y2K TESTING AND VALIDATION. The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component. *NEI/NUSMG 97-07, §5.5*

YES	NO	N/A			
			460	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 97-07, §5.5*	NR
			461	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 97-07, §5.5, Appendix E*	
			461a.	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.	NR
			461b.	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YYYY, or any of the other common formats currently used that incorporate date, month, and year.	NR
			461c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.	NR
			461d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.	NR
			461e.	**Year 2000 Rollover Gregorian Cold?**	NR
			461f.	**Year 2000 Julian Rollover Cold?**	NR
			461g.	**Year 2000 Leap Year Rollover Warm?**	NR
			461h.	**Year 2000 Leap Year Rollover Gregorian Warm?**	NR

YES	NO	N/A			
			461i.	**Year 2000 Leap Year Rollover Julian Warm?**	NR
			461j.	**Year 2000 Leap Year Rollover Cold?**	NR
			461k.	**Year 2000 Leap Year Rollover Gregorian Cold?**	NR
			461l.	**Year 2000 Leap Year Rollover Julian Cold?**	NR
			461m.	**High Risk Date 9/9/99?**	NR
			461n.	**Date Integrity 2/29/01?**	NR
			462	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*	NR
			463	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*	NR
				ENS NOTIFICATION *NEI/NUSMG 97-07 §5.6*	
			480	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*	NR
			481	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*	NR

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PLANT PROCESS COMPUTER SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software/Component Name? _____

Lic. Pkg Number? _____

PPC INITIAL ASSESSMENT

YES NO N/A

500 For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units? Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience* NR

PPC Analysis of Initial Assessment

YES NO N/A

501 Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment? *NEI/NUSMG 97-07, §5.2.5* NR

PPC DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES NO N/A

520 Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process? The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. *NEI/NUSMG 97-07, §5.3* NR

PPC Evaluations by Vendor Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates. *NEI/NUSMG 97-07, §5.3.1*

YES NO N/A

521 Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor? *NEI/NUSMG 97-07, §5.3.1* NR

YES NO N/A

522 Did the licensee provide a generic Y2K compliance specification to the vendor? *NEI/NUSMG 97-07, §5.3.1* NR

YES NO N/A

523 Does the licensee intend to use the generic specification in future purchases of this software application or embedded component? Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1* NR

YES NO N/A

524 Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List? Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1* NR

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PPC Owned or Supported by Utility *NEI/NUSMG 97-07, §5.3.2*

YES	NO	N/A			
			525	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*	NR
			526	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*	NR

Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*

YES	NO	N/A			
			527	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*	NR

PPC Remediation Planning *NEI/NUSMG 97-07, §5.3.4*

YES	NO	N/A			
			528	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*	NR
			529	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*	
			529a.	**Options evaluated?**	NR
			529b.	**Schedule?**	NR
			529c.	**Benefits?**	NR
			529d.	**Risks?**	NR

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PPC REMEDIATION. The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase.

540 Did the licensee: *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A			
			540a.	**Track the progress of the remediation activity?**	NR
			540b.	**Document the risk evaluation?**	NR
			540c.	**Follow existing software quality assurance procedures?**	NR
			540d.	**Follow existing station modification procedures?**	NR
			540e.	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*	NR

PPC Contingency Plan

YES	NO	N/A			
			541	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*	NR

542 Did the contingency plan include: *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A			
			542a.	**An inventory number or other unique identifier?**	NR
			542b.	**A description of the risk?**	NR
			542c.	**Identification of the subject matter expert?**	NR
			542d.	**Event analysis?**	NR
			542e.	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**	NR
			542f.	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.	NR

YES	NO	N/A			
			542g.	**Period of vulnerability?**	NR
			542h.	**Priority?**	NR
			542i.	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.	NR
			542j.	**Resources?**	NR
			542k.	**Implementation timing?**	NR
			542l.	**If needed, an exit strategy?**	NR
			542m.	**Training requirements?**	NR
			542n.	**Requirements for special Y2K procedures?**	NR
			542o.	**Identification and documentation of verification?**	NR
			542p.	**Management approval?**	NR
			543	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*	NR

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PPC Y2K TESTING AND VALIDATION. The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component. *NEI/NUSMG 97-07, §5.5*

YES	NO	N/A			
			560	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 97-07, §5.5*	NR
			561	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 97-07, §5.5, Appendix E*	
			561a.	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.	NR
			561b.	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YYYY, or any of the other common formats currently used that incorporate date, month, and year.	NR
			561c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.	NR
			561d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.	NR
			561e.	**Year 2000 Rollover Gregorian Cold?**	NR
			561f.	**Year 2000 Julian Rollover Cold?**	NR
			561g.	**Year 2000 Leap Year Rollover Warm?**	NR
			561h.	**Year 2000 Leap Year Rollover Gregorian Warm?**	NR

YES	NO	N/A			
			561i.	**Year 2000 Leap Year Rollover Julian Warm?**	NR
			561j.	**Year 2000 Leap Year Rollover Cold?**	NR
			561k.	**Year 2000 Leap Year Rollover Gregorian Cold?**	NR
			561l.	**Year 2000 Leap Year Rollover Julian Cold?**	NR
			561m.	**High Risk Date 9/9/99?**	NR
			561n.	**Date Integrity 2/29/01?**	NR
			562	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*	NR
			563	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*	NR
				PPC NOTIFICATION *NEI/NUSMG 97-07 §5.6*	
			580	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*	NR
			581	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*	NR

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PLANT SECURITY SYSTEM SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software/Component Name? _____

Lic. Pkg Number? _____

PSS INITIAL ASSESSMENT

YES	NO	N/A			
			600	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*	NR

PSS Analysis of Initial Assessment

YES	NO	N/A			
			601	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*	NR

PSS DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A			
			620	**Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. *NEI/NUSMG 97-07, §5.3*	NR

PSS Evaluations by Vendor. Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

NEI/NUSMG 97-07, §5.3.1

YES	NO	N/A			
			621	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			622	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*	NR
			623	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*	NR
			624	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*	NR

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PSS Owned or Supported by Utility *NEI/NUSMG 97-07, §5.3.2*

YES	NO	N/A			
			625	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*	NR
			626	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*	NR

Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*

YES	NO	N/A			
			627	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*	NR

PSS Remediation Planning *NEI/NUSMG 97-07, §5.3.4*

YES	NO	N/A			
			628	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*	NR
			629	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*	
			629a.	**Options evaluated?**	NR
			629b.	**Schedule?**	NR
			629c.	**Benefits?**	NR
			629d.	**Risks?**	NR

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PSS REMEDIATION. The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase.

640 Did the licensee: *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A			
			640a.	**Track the progress of the remediation activity?**	NR
			640b.	**Document the risk evaluation?**	NR
			640c.	**Follow existing software quality assurance procedures?**	NR
			640d.	**Follow existing station modification procedures?**	NR
			640e.	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*	NR

PSS Contingency Plan

YES	NO	N/A			
			641	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*	NR

642 Did the contingency plan include: *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A			
			642a.	**An inventory number or other unique identifier?**	NR
			642b.	**A description of the risk?**	NR
			642c.	**Identification of the subject matter expert?**	NR
			642d.	**Event analysis?**	NR
			642e.	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**	NR
			642f.	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.	NR

YES	NO	N/A			
			642g.	**Period of vulnerability?**	NR
			642h.	**Priority?**	NR
			642i.	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.	NR
			642j.	**Resources?**	NR
			642k.	**Implementation timing?**	NR
			642l.	**If needed, an exit strategy?**	NR
			642m.	**Training requirements?**	NR
			642n.	**Requirements for special Y2K procedures?**	NR
			642o.	**Identification and documentation of verification?**	NR
			642p.	**Management approval?**	NR
			643	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*	NR

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PSS Y2K TESTING AND VALIDATION. The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component. *NEI/NUSMG 97-07, §5.5*

YES	NO	N/A			
			660	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 97-07, §5.5*	NR
			661	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 97-07, §5.5, Appendix E*	
			661a.	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.	NR
			661b.	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YYYY, or any of the other common formats currently used that incorporate date, month, and year.	NR
			661c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.	NR
			661d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.	NR
			661e.	**Year 2000 Rollover Gregorian Cold?**	NR
			661f.	**Year 2000 Julian Rollover Cold?**	NR
			661g.	**Year 2000 Leap Year Rollover Warm?**	NR
			661h.	**Year 2000 Leap Year Rollover Gregorian Warm?**	NR

YES	NO	N/A			
			661i.	**Year 2000 Leap Year Rollover Julian Warm?**	NR
			661j.	**Year 2000 Leap Year Rollover Cold?**	NR
			661k.	**Year 2000 Leap Year Rollover Gregorian Cold?**	NR
			661l.	**Year 2000 Leap Year Rollover Julian Cold?**	NR
			661m.	**High Risk Date 9/9/99?**	NR
			661n.	**Date Integrity 2/29/01?**	NR
			662	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*	NR
			663	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*	NR
				PSS NOTIFICATION *NEI/NUSMG 97-07 §5.6*	
			680	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*	NR
			681	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*	NR

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CONTINGENCY PLANNING. Effective contingency planning provides a process for reducing the risks associated with Y2K-induced events. Contingency plan elements may be divided into three categories based on the source of the risk. These three categories are remediation risks, internal facility risks, and external risks. The remediation risk category addresses the contingency planning for individual software application and embedded component contingency plans. Issues related to the remediation category are addressed in the above six software application and embedded component reviews. The licensee should have developed an integrated contingency plan from individual contingency plans to mitigate Y2K-induced events that could occur on key rollover dates. Contingency planning issues related to the internal and external contingency planning categories and the integrated contingency plan are addressed in the following sets of questions.

CONTINGENCY MANAGEMENT

YES	NO	N/A			
			700	**Does the licensee have a single point or a focus point of contact?** Because of the importance and complexity of contingency planning, the Y2K project manager should consider assigning a single point of contact for contingency planning. Generally, the single point of contact should be somebody with extensive experience in nuclear plant operations, (e.g., a Senior Reactor Operator). *NEI/NUSMG 98-07, §4*	NR

CONTINGENCY PLANNING FOR INTERNAL FACILITY RISKS. The inventory, assessment, and remediation phases of the Y2K project are designed to provide identification and remediation for software applications or embedded components that could degrade, impair, or prevent operability of the plant. However, there remains some risk that digital systems could still be subject to Y2K-induced events that could affect plant operations. The purpose of internal risk contingency planning is to provide a logical approach to anticipate and prepare for such events and reduce their impact on facility operations.

An example of an internal facility risk is a control system that relies upon process computer signals, embedded devices, and complex interfaces to other systems. These relationships become evident in the inventory and assessment process. Based on the importance of this system and its complexities, management may elect to develop an individual contingency plan for it. *NEI/NUSMG 98-07, §6 & Appendix C*

YES	NO	N/A			
			720	**Do the licensee's internal contingency plans identify failure modes and mitigation strategies?** *NEI/NUSMG 98-07, §6*	NR
			721	**Did the licensee's contingency planning consider the potential that a problem could result in a common mode failure that could potentially affect many systems or components, including essential infrastructure services?** *NEI/NUSMG 98-07, §4*	NR

Risk Identificationfor Internal Facility Events

722 Risk identification for internal facility events includes a review of the Y2K inventory and assessment results for devices and software. The risk is a function of the short-term challenge to continued facility operation, the complexity of the system, and the degree of remediation that may have been required. *NEI/NUSMG 98-07, §6.1*

Did the licensee consider:

YES	NO	N/A			
			722a.	**Software applications or embedded components whose failure places the unit at short-term risk for continued operation?**	NR
			722b.	**Systems with multiple, integrated digital control devices or software subsystems?**	NR
			722c.	**Systems that use digital inputs from other systems?**	NR
			722d.	**Systems for which significant remediation effort was required?**	NR

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Event Analyses for Internal Facility Events

723 Event analysis is used to determine failure modes and their consequences. Analytical processes may include review of existing safety analyses and probability risk assessments (PRA). Simulations and experience-based judgements may be used to understand the implications of failure modes.

For each event, did the licensee consider: *NEI/NUSMG 98-07, §6.2*

YES	NO	N/A			
			723a.	**Event consequences on safety or operability, including safe shutdown operations?**	NR
			723b.	**The likelihood of the event occurring?**	NR
			723c.	**The importance of the event with regard to the objectives of the facility?**	NR
			723d.	**The time of event occurrence - immediate, delayed, or an unknown time of occurrence?**	NR
			723e.	**The long term effects of the event?**	NR

Risk Managementfor Internal Facility Events

724 Risk management uses the information from event analysis to determine the mitigation strategies that will reduce the effect of a Y2K-induced event. Risk management may also consider interdependencies. *NEI/NUSMG 98-07, §6.3*

Do the licensee's mitigation strategies consider:

YES	NO	N/A			
			724a.	**Augmented staff?**	NR
			724b.	**Implementing manual control?**	NR
			724c.	**Placing backup or standby systems in service?**	NR
			724d.	**Developing special procedures?**	NR
			724e.	**Establishing specific training requirements?**	NR
			724f.	**Monitoring systems to ensure proper operation following a key rollover date?**	NR
			725	**Did the licensee consider existing procedures and practices to develop mitigation strategies?** *NEI/NUSMG 98-07, §6.3*	NR

Verification for Internal Facility Events *NEI/NUSMG 98-07, §6.4*

YES	NO	N/A			
			726	**Did the licensee verify the contingency plans?** Verifying contingency plans provides confidence that the strategy selected is capable of achieving the intended purpose, can be accomplished coincident with other strategies, and includes personnel who are able to exercise it. The methods that may be used for this evaluation include management assessments, independent reviews, and peer evaluations. *NEI/NUSMG 98-07, §6.4*	NR

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CONTINGENCY PLANS FOR EXTERNAL RISKS. External risks result from circumstances, conditions, or events that are not under the direct control of facility management. The purpose of external risk contingency planning is to provide an awareness of such risks and the means of mitigation.

NEI/NUSMG 98-07, Appendix D

Risk Identificationfor External Risks. Risk identification considers how Y2K-induced external events could compromise the safety or continued operation of the facility. One technique that may be used is boundary analysis.

Boundary analysis postulates a boundary surrounding the facility. Items, signals, information, or data that cross the boundary are candidates for investigation. Examples include transmission lines, communications, consumables, and services. This technique may result in a detailed examination of facility supply chains for a limited number of critical services and consumables for vulnerability to disruption by a Y2K-induced event. Particular attention should be given to facility services or equipment that are jointly administered, either in concert with the facility or by more than one external supplier.

Examples of documents and contingency activities that may be used to identify external events include plans for disaster recovery, resumption of business, station blackout, grid restoration, emergency preparedness, and storm restoration.

NEI/NUSMG 98-07, §7.1

740 In contingency planning for external events, did the licensee include:

YES	NO	N/A			
			740a.	**Transmission/distribution system events?** For example, loss of off-site power, grid instability and voltage fluctuations, and loss of grid control systems.	NR
			740b.	**Loss of ultimate heat sink?**(e.g., river water level control is upset)	NR
			740c.	**Depletion of consumables?** (e.g., bottled gases, diesel fuel, and demineralizer resins)	NR
			740d.	**Loss of essential services?** (e.g., telephones, microwave, domestic water, satellite networks, selected vendors, security, police, and fire fighting capabilities)	NR
			740e.	**Loss of emergency plan equipment and services?**(e.g., pagers, radios, sirens, and meteorology).	NR

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Event Analysis for External Events

750 The purpose of external event analysis is to understand and evaluate the implications of external events. *NEI/NUSMG 98-07, §7.2*

For each event, did the licensee consider:

YES	NO	N/A			
			750a.	**The affect of the event on safety or operability, including at-power or safe shutdown conditions?**	NR
			750b.	**The likelihood of the event?**	NR

YES	NO	N/A			
			750c.	**The potential for an event inducing other events, or changing the probability of those events?**	NR
			750d.	**The timing of the event consequences (i.e., immediate, delayed with a known time-to-occurrence, or delayed with an unknown time-to-occurrence)?**	NR
			750e.	**The priority for resumption of service?**	NR
			750f.	**The long-term effect of the event?**	NR
			751	**Did the licensee consider the effect that a complex supply chain may have on the mitigation strategy?** A supplier may rely on another supplier or service that is subject to Y2K-induced events. A chain of failures in a complex supply chain may compromise more than is readily apparent by looking at only the final source. *NEI/NUSMG 98-07, §7.2*	NR

RISK MANAGEMENT FOR EXTERNAL RISKS. Risk Management uses the information from event analysis to determine the mitigation strategies that will reduce the effect of a Y2K-induced event. It ensures that the risks posed by external Y2K-induced events are identified and are reduced to an acceptable level. Risk management may mitigate the risk or may extend the period of facility service pending resumption of the service or conclusion of the event. This management function requires input from business and technical specialists. The two phases of risk management are risk notification and selection of mitigation strategy.

NEI/NUSMG 98-07, §7.3

Risk Notification *NEI/NUSMG 98-07, §7.3.1*

YES	NO	N/A			
			752	**Did the licensee communicate to the responsible external organizations the risk significance to the facility of a Y2K-induced event?**	NR
			753	**Did the licensee request from the external organizations a description of their Y2K project plans to address Y2K-induced events?**	NR
			754	**Did the licensee include this information in their mitigation strategies?**	NR

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Mitigation Strategy Selection

755 More than one mitigation strategy may be appropriate and employed for an event.

NEI/NUSMG 98-07, §7.3.2

Did the licensee consider:

YES	NO	N/A			
			755a.	**Facility alignment?** Preset facility load or capacity to reduce the consequences to the facility of grid instability or voltage fluctuations. High-risk evaluations, such a reduced reactor coolant inventory operations or emergency diesel generator maintenance should be scheduled to avoid Y2K key rollover dates, when possible.	NR
			755b.	**Minimized dependency?** Stockpiling consumables to support continued facility operation.	NR

YES	NO	N/A			
			755c.	**Alternate sources?** Many consumables are available from more than one source.	NR
			755d.	**Alternate processes?** Some services such as telecommunications may be accomplished using alternate methods. For example, portable radios or satellite phones may be used to compensate for normal telephone service.	NR
			755e.	**Rapid resumption of services?** Where a proactive mitigation strategy is unobtainable or impractical, the management team may adopt rapid resumption of service as a recovery strategy. An example might be a system that will be interrupted by the Y2K-induced event but is easily restarted with support from the external organization.	NR

Verification for External Risks *NEI/NUSMG 98-07, §7.4*

YES	NO	N/A			
			756	**Did the licensee verify the risk management strategy?** This process provides confidence that the strategy selected is capable of achieving the intended purpose, can be accomplished coincident with other strategies, and includes personnel who are able to execute it. Methods that can be used for this evaluation may include management assessments, independent reviews, peer reviews, external organization reviews, walk-throughs, drills, or simulations. *NEI/NUSMG 98-07, §7.4*	NR

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INTEGRATED Y2K CONTINGENCY PLAN. The integrated contingency plan is a compilation of individual contingency plans and includes the remediation actions planned for key rollover dates. The document is used to manage the resources and staffing required to support the facility leading up to and during the key rollover dates. Inputs required for development of the integrated plan include organization sponsorship and key contacts; identification or required internal and external organizational support; coordination with internal and external interfaces; identification of conflicts among individual contingency plans; and identification of resources necessary to implement individual contingency plans.

NEI/NUSMG 98-07, §8

Integrated Y2K Contingency Plan Development *NEI/NUSMG 98-07, §8.1*

YES	NO	N/A			
			760	**Is the Y2K project manager responsible for developing the contingency plan?** *NEI/NUSMG 98-07, §8.1*	NR
			761	**Are staffing plans and actions in the integrated plan?** *NEI/NUSMG 98-07, §8.1*	NR
			762	**Are overall resource requirements documented in the plan?** *NEI/NUSMG 98-07, §8.1*	NR
			763	**Has (or will) the plan be reviewed and approved by senior management?** *NEI/NUSMG 98-07, §8.1*	NR

Integrated Y2K Contingency Plan Content

780 Does the integrated Y2K contingency plan include the following topics:

NEI/NUSMG 98-07, §8.2

YES	NO	N/A			
			780a.	**Purpose and scope?** The purpose of the plan is to integrate the licensee's resources for a facility-wide approach to mitigate Y2K-induced events. The scope establishes the boundaries of the plan.	NR
			780b.	**Integrated contingency plan matrix?** The matrix provides the relationship between the individual contingency plans.	NR
			780c.	**Responsibilities?** The plan should assign responsibilities for managing the implementation of the integrated plan. These responsibilities may include an integrated Y2K contingency plan coordinator, implementation teams, and advisory teams.	NR
			780d.	**Resource scheduling?** The plan should coordinate the timing and resources necessary for implementing the elements of the integrated contingency plan. This includes coordination between departments, groups, and outside agencies.	NR
			780e.	**Event response coordination?** The plan should identify the key decision-making processes for responding to Y2K-induced events as they occur.	NR
			780f.	**Integrated action plan?** The plan should summarize the actions associated with the restoration of facility systems, components, and equipment affected by Y2K-induced events.	NR
			780g.	**Integrated Y2K contingency plan training and awareness?** The plan should identify specific Y2K training requirements. General facility awareness training on Y2K critical dates and associated contingencies also should be considered.	NR

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Comments (e.g., **161a.** Licensee omitted Year 2000 Rollover Warm. Testing has been scheduled.)

Example Listing from TI Checklist (Attachment A)

Summary of Checklist Review Results
for
Perfect Valley Nuclear Power Plant
(Docket Number 50-789)
Public Safety Power & Light

The staff conducted an abbreviated review of Y2K activities and documentation using Temporary Instruction (TI) 2515/141, "Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants." The review addressed aspects of Y2K management planning, documentation, implementation planning, initial assessment, detailed assessment, remediation activities, Y2K testing and validation, notification activities, and contingency planning. The reviewers used NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," as the basis for this review.

Conclusions regarding the Y2K readiness of this facility are not included in this summary. The results of this review will be combined with reviews of Y2K programs at other plants in a summary report to be issued by July 31, 1999.

Answers to the questions in the review checklist are summarized as follows:

THE FOLLOWING 313 QUESTIONS WERE ANSWERED "YES":

1	2	3	4	5	6	7	8	9	10
11a.	11b.	11c.	11d.	12	13	14	15	16a.	16b.
17	18	20	21	22a.	22b.	22c.	23	24	25
30a.	30b.	30c.	30d.	30e.	30f.	31a.	31b.	31c.	31d.
40	41a.	41b.	41c.	41d.	42a.	42b.	42c.	43	44a.
44b.	44c.	44d.	44e.	44f.	44g.	44h.	45	101	120
121	122	123	124	125	126	127	128	129a.	129b.
129c.	129d.	140a.	140b.	140c.	140d.	140e.	160	161a.	161b.
161d.	161e.	161g.	161h.	161j.	161k.	161n.	162	163	180
220	221	222	223	224	225	226	227	228	229a.
229b.	229c.	229d.	240a.	240b.	240c.	240d.	240e.	260	261a.
261b.	261d.	261e.	261g.	261h.	261j.	261k.	261n.	280	281
301	320	321	322	323	325	326	327	328	329a.
329b.	329c.	329d.	340a.	340b.	340c.	340d.	340e.	360	361a.
361b.	361d.	361e.	361g.	361h.	361j.	361k.	361n.	362	363
380	381	401	420	421	422	423	424	425	426
427	428	429a.	429b.	429c.	429d.	440a.	440b.	440c.	440d.
440e.	460	461a.	461b.	461c.	461d.	461e.	461f.	461g.	461h.
461i.	461j.	461k.	461l.	461m.	461n.	462	463	480	481
501	520	521	522	523	524	525	526	527	528
529a.	529b.	529c.	529d.	540a.	540b.	540c.	540d.	540e.	560
561a.	561b.	561c.	561d.	561e.	561f.	561g.	561h.	561i.	561j.

561k.	561l.	561m.	561n.	562	563	580	581	601	620
621	622	623	624	625	626	627	628	629a.	629b.
629c.	629d.	640a.	640b.	640c.	640d.	640e.	660	661a.	661b.
661c.	661d.	661e.	661f.	661g.	661h.	661i.	661j.	661k.	661l.
661m.	661n.	662	663	680	681	700	720	722a.	722b.
722c.	723a.	723b.	723c.	723d.	723e.	724b.	724c.	724d.	724e.
724f.	725	726	740a.	740b.	740c.	740d.	740e.	750a.	750b.
750c.	750d.	750e.	750f.	752	753	754	755a.	755b.	755c.
755d.	755e.	756	760	762	763	780a.	780b.	780c.	780d.
780e.	780f.	780g.							

THE FOLLOWING 112 QUESTIONS WERE ANSWERED "NO":

141	142a.	142b.	142c.	142d.	142e.	142f.	142g.	142h.	142i.
142j.	142k.	142l.	142m.	142n.	142o.	142p.	181	201	241
242a.	242b.	242c.	242d.	242e.	242f.	242g.	242h.	242i.	242j.
242k.	242l.	242m.	242n.	242o.	242p.	262	263	324	341
342a.	342b.	342c.	342d.	342e.	342f.	342g.	342h.	342i.	342j.
342k.	342l.	342m.	342n.	342o.	342p.	441	442a.	442b.	442c.
442d.	442e.	442f.	442g.	442h.	442i.	442j.	442k.	442l.	442m.
442n.	442o.	442p.	541	542a.	542b.	542c.	542d.	542e.	542f.
542g.	542h.	542i.	542j.	542k.	542l.	542m.	542n.	542o.	542p.
641	642a.	642b.	642c.	642d.	642e.	642f.	642g.	642h.	642i.
642j.	642k.	642l.	642m.	642n.	642o.	642p.	721	722d.	724a.
751	761								

THE FOLLOWING 27 QUESTIONS WERE NOT APPLICABLE "N/A":

100	143	161c.	161f.	161i.	161l.	161m.	200	243	261c.
261f.	261i.	261l.	261m.	300	343	361c.	361f.	361i.	361l.
361m.	400	443	500	543	600	643			

REVIEWER'S COMMENTS:

Questions 141 - 142p, 241 - 242p, 341 - 342p, 441-442p; 541-542p; and 641-642p. The licensee has not prepared individual contingency plans for any of the software applications and embedded components reviewed. Discussed this finding with the Y2K PM. This is a programmatic discrepancy, and should receive additional followup by the Resident.

Question 181 - The licensee remediated the Reactor Trip Breaker Tester (Pkg. PV001275), but did not change the associated documentation. The licensee committed to change the documentation. This was an isolated discrepancy.

Question 201 - The licensee did not have a schedule for completing the SG Water Chemistry Analyzer (Pkg. PV002357).

Questions 262& 263 - The licensee did not validate the SG Water Chemistry Analyzer after replacing the non-compliant Y2K chip.

Question 324 - The licensee used the Vendor's website certification information without performing confirmatory testing. This was brought to the Y2K PM's attention. The licensee is scheduling the confirmatory tests.

Question 721 - The licensee did not perform common mode failure analyses that could affect many systems or components. This is a major discrepancy in the licensee's contingency planning program.

Question 722d. - In the event analyses for internal facility events, the licensee considered the effects of immediate events occurring during the December 31 rollover to January 1, but did not consider longer term events, such as failure of a component when it is called on to perform a safety function at another time. The licensee is reviewing this discrepancy.

Question 724a. - The licensee did not consider staff requirements for implementing all the work arounds identified in the Detailed Assessment phase.

Question 751 - The licensee has not considered complex supply chain effects.

Question 761 - There are no staffing plans or actions in the Integrated Contingency Plan. The licensee will address this issue.

Temporary Instruction xxxx/xxx

REVIEW OF YEAR 2000 (Y2K) READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS

SALP FUNCTIONAL AREA: ENGINEERING (ENG)

APPLICABILITY: All plants

xxxx/xxx-01 OBJECTIVES

01.01 To review licensee Y2K program activities that ensure a level of readiness in accordance with GL 98-01 or GL 98-01 Supplement 1 guidelines.

xxxx/xxx-02 BACKGROUND

On May 11, 1998, the staff issued GL 98-01 to require licensees to provide information regarding their programs, planned or implemented, to address the Y2K problem in computer systems at their facilities. In the GL, reference is made to NEI/NUSMG 97-07, “Nuclear Utility Year 2000 Readiness” which describes an approach that licensees may utilize to address the Y2K problem at their facilities. This guidance document resulted from a joint effort between the Nuclear Energy Institute (NEI) and the Nuclear Utility Software Management Group (NUSMG).

In addition to NEI/NUSMG 97-07, the licensee received guidance for developing contingency plans for remediated software systems and embedded components, internal events, external events, and for producing an integrated contingency plan. This guidance was provided in NEI/NUSMG 98-07, “Nuclear Utility Year 2000 Readiness Contingency Planning.”

The concept of Y2K “readiness” as opposed to “compliancy” is being emphasized with regard to how licensees are addressing their Y2K problems. As indicated in NEI/NUSMG 97-07, ‘Y2K Compliant’ pertains to an accurate processing of date/time data from, into, and between the twentieth and twenty-first century, the years 1999 and 2000, and leap-year calculations. ‘Y2K Ready’ pertains to a computer system or application that has been determined to be suitable for continued use into the year 2000 even though the computer system, application, or device is not fully Y2K compliant.

In September 1998, NRC staff began auditing 12 representative sites to evaluate licensee Y2K programs. The scope of each audit addressed 40-50 software applications and embedded systems and components, licensee contingency planning activities, grid stability issues, and critical supplier issues. The results of these audits were provided to the licensees and were also published

for public, licensee, and Congressional review on an NRC website (http://www.nrc.gov/NRC/Y2K/Y2KNRR.html).

In March 1999, following discussions with members of Congress, the Commission expanded the number of audits to include all nuclear power plant sites. Because timeliness of these audits is critical, the depth of the audit activities has been reduced from the scope described in TI 2515/140, "Year 2000 (Y2K) Readiness Of Computer Systems at Nuclear Power Plants," to a review of licensee Y2K activities. This TI provides guidance to NRC Resident Inspectors and NRC Regional Inspectors regarding the scope of the review activities and reporting requirements.

xxxx/xxx-03 REVIEW ACTIVITIES

03.01 Y2K Program. Verify through spot checks that the licensee has implemented a Y2K Program that addresses the following areas as suggested in NEI/NUSMG 97-07 and NEI/NUSMG 98-07:

a. Management Planning,

b. Documentation,

c. Implementation Planning,

d. Initial Assessment,

e. Detailed Assessment,

f. Remediation Activities,

g Y2K Testing and Validation,

h. Notification Activities, and

i. Contingency Planning.

xxxx/xxx-04 REVIEW GUIDANCE

GENERAL GUIDANCE

Notification of Review. The reviewer should notify the licensee of the onsite review and should confirm that key licensee personnel involved with the Y2K Program will be available.

Document Review. The following reference documents provide guidance to support the Y2K reviews.

a. Generic Letter 98-01 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001.html)
b. Generic letter 98-01, Supplement 1 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001s1.html)
c. NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness" (http://www.nei.org/library/97-07.pdf)
d. NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Contingency Plans" (http://www.nei.org/library/98-07.pdf)

Onsite Review. This review should include a review of relevant documentation, and interaction with the plant Y2K project manager. Examples of relevant documentation are: the facility Y2K management plan, implementation plan, inventory listing/database, initial and detailed assessment documents, remediation activities, Y2K testing and validation records, notification activities, and contingency planning.

SPECIFIC GUIDANCE

04.01 Y2K Program

NEI/NUSMG 97-07 suggests a five phase approach to ensure that a licensee's plant continues to operate safely and within the requirements of their license and NRC regulations. The status of the implementation of these phases and schedules for remaining activities, including planning and coordination of Y2K-related work during currently planned outages, should be examined against the July 1, 1999, Y2K readiness date in GL 98-01. The allocation of resources for completion of the phases should also be reviewed.

The scope of the Y2K program generally includes all plant software, embedded systems, interfaces, and components that may be affected by the Y2K problem. The reviewer should confirm that the licensee has included in the inventory and assessment phase a review of embedded software systems. The Y2K program plan should provide appropriate emphasis on safety-related systems/components and systems required for safe operation at the initial and detailed assessment stages via the categorization, classification and prioritization activities of the program.

In addition to the information provided in NEI/NUSMG 97-07, contingency planning, as described in NEI/NUSMG 98-07, should be reviewed. Contingency actions to be taken in the event that unanticipated occurrences or malfunctions occur should be reviewed against the potential concerns identified in the Y2K program.

Contingency planning activities address three types of hazards: 1) remediation hazards, 2) internal hazards, and 3) external hazards. The reviewer should confirm that all three evaluations are considered in the integrated plant Y2K contingency plan.

The reviewer should complete the attached Y2K review checklist. This checklist provides the review criteria for the spot check.

xxxx/xxx-05 REPORTING REQUIREMENTS

The reviewer will document the results of the review in the attached checklist. This checklist will be forwarded to the Regional Headquarters, where it will be compiled with other checklists in a summary format. The resulting summary report will be forwarded to Mr. Matt Chiramal (mxc@nrc.gov) at NRC Headquarters in electronic format.

xxxx/xxx-06 COMPLETION SCHEDULE

The review checklists and summary reports should be completed and forwarded to the Regional staff by June 30, 1999. The Regions shall compile the checklist and forward the compilations electronically to Mr. Matt Chiramal (mxc@nrc.gov) at NRC Headquarters by July 15, 1999. A report summarizing the checklist results will be prepared by NRC Headquarters by July 31, 1999.

xxxx/xxx-07 EXPIRATION

This TI will expire on September 30, 1999.

xxxx/xxx-08 TECHNICAL CONTACT

Address questions regarding the technical aspects of this TI to Matthew Chiramal, (301) 415-2845 (mxc@nrc.gov), or Michael Waterman, (301) 415-2818 (mew1@nrc.gov).

xxxx/xxx-09 STATISTICAL DATA REPORTING

Direct review effort expended in completing the requirements of this TI is to be charged to xxxx/xxx under IPE (Inspection Program Element) SI, and IMI (Items of major interest), code IENG. No SIMS number is applicable to this TI.

xxxx/xxx-10 ORIGINATING ORGANIZATION RESPONSIBILITY

10.01 Organizational Responsibility

This TI was initiated by EICB/DE/NRR.

10.02 Resource Estimates

All nuclear power plant sites will be reviewed under this TI. For the 12 plant sites that were previously audited by the NRC, this TI will be used for review of the plant-specific Y2K program activities conducted since the audit, including contingency plans.

Since a licensee's Y2K readiness program may be managed from the licensee's corporate office, a portion of the review may be conducted at the corporate office. The resource estimate to complete this TI is 40 hours per review.

10.03 Other. No parallel procedures exist for this TI.

10.03 Training. One day of training is required for this TI.

END

Y2K REVIEW CHECKLIST

The purpose of this checklist is to guide the review of licensee Y2K program activities to ensure a level of readiness in accordance with GL 98-01 or GL 98-01 Supplement 1 guidelines.

In performing this review, the reviewer should recognize the important role an independent reviewer provides to successful completion of the licensee's Y2K program. Often, the licensee may be highly focused on remediating individual software applications or embedded components, and may not have a comprehensive overall view of their process. The reviewer provides that viewpoint and, consequently, may discover inconsistencies in the licensee's project implementation that would not have been discovered by the licensee until much later. One of the most important functions of the reviewer, therefore, is to discover these inconsistencies and bring them to the licensee's attention in a timely manner.

The materials required for this review include:

- The licensee's Y2K project plan
- Licensee status reports and tracking reports
- An inventory listing of the licensee's software applications and embedded components
- Access to the licensee's Y2K documentation packages for the software systems and embedded components that will be used in this review.
- Contingency plan documentation
- Supporting licensee documentation, as required
- NEI/NUSMG 97-07 (http://www.nei.org/library/97-07.pdf)
- NEI/NUSMG 98-07 (http://www.nei.org/library/98-07.pdf)
- GL 98-01 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001.html)
- GL 98-01, Suppl 1 (http://www.nrc.gov/NRC/GENACT/GC/GL/1998/gl98001s1.html)

The questions to be answered are printed in **boldface** type. Supporting information related to the questions is printed in normal type. References to supporting sources of information are provided in *italicized* type.

Place an '**X**' in the appropriate box for each of the following questions. If an electronic version of the checklist is used, answer the questions by replacing the corresponding box (G) with an uppercase '**X**'

If a questionnaire answer is **NO**, but the associated issue is resolved through discussions with the licensee or because the licensee addresses the issue appropriately elsewhere in its Y2K program, place an '**X**' in the **NO** box and the **N/A** box. If supporting comments are necessary, provide these comments (referenced by question number) as an attachment to the checklist.

Questions regarding this checklist should be directed to:

Michael E. Waterman
US NRC
Washington, DC 20555

or e-mail: mew1@nrc.gov

Plant Name? _____

Licensee Name? _____

Reviewer's Name? _____

Date? _____

MANAGEMENT PLANNING *NEI/NUSMG 97-07, §4*

YES	NO	N/A		
G	G	G	1	**Has senior management been actively involved in informing their personnel about the vulnerability of their utility to Y2K issues?** This may be determined by reviewing senior management announcements regarding Y2K activities and commitments. Senior management's attention to the Y2K problem indicates their commitment to maintaining the margin of safety and the operability of their facilities. *NEI/NUSMG 97-07, §4.1*
YES	NO	N/A		
G	G	G	2	**Is the Y2K Project Sponsor a Senior Manager?** (e.g., Chief Nuclear Officer, Vice President of Nuclear Engineering, or Vice President of Nuclear Operations). The Y2K project requires significant commitments of personnel, facilities, and funds. The project also requires support between organizations within the utility. These resources are typically authorized by senior management. *NEI/NUSMG 97-07, §4.2*
				The project sponsor should be actively engaged in the oversight of the project. This involvement may be supplemented by outside organizations that provide oversight of the project. Meeting Y2K project milestones indicates a commitment by the licensee to address Y2K issues. The auditor may use slipped schedules as an indicator for determining senior management involvement in the Y2K project. If there are one or two slipped milestones early in the project, and all other milestones have been met, the likely cause is increased awareness and personal attention by senior management. If slipped schedules are common throughout the project life, this is a symptom that senior management may not be aware of Y2K vulnerabilities at the facility or may not be actively involved in the Y2K project. The following two questions address project sponsor participation.
YES	NO	N/A		
G	G	G	3	**Has the Y2K project met all of its Y2K Project milestones?** This may be determined by reviewing project status reports comparing actual progress with project milestones. These status reports are usually maintained by the Y2K Project Manager. *NEI/NUSMG 97-07, §4.2, 4.3*
YES	NO	N/A		
G	G	G	4	**If the Y2K Project team did miss a milestone, did licensee senior management (i.e., the Y2K Project Sponsor or Y2K Project Owner) respond with corrective actions?** There may not be any documentation confirming this response; however, the answer to this question may be obtained through discussions with the Y2K Project Manager about past schedule slippages and senior management's response. *NEI/NUSMG 97-07, §4.2, 4.3*

YES	NO	N/A		
G	G	G	5	**Has the licensee committed sufficient resources for this project?** Typically, licensees have been committing 15-25 FTEs for their Y2K projects. These people may be assigned to the project on a full time basis, or may be assigned as needed. Committing less than 15 FTEs indicates senior management may not be fully aware of their facility's vulnerability to Y2K problems. Typically, a single nuclear power plant will have approximately 700 applications and embedded components that have potential Y2K vulnerabilities. Detailed assessment of this many applications and embedded components requires a significant commitment of personnel, equipment, and funding resources. *NEI/NUSMG 97-07, §4.2*, *NRC experience*
G	G	G	6	**Is the Y2K Project Manager a full time position?** Assigning project management as a part time position indicates senior management may not be fully aware of the scope of their facility's vulnerability to Y2K problems. *NEI/NUSMG 97-07, §4.3*
G	G	G	7	**Has the project manager documented the project sponsor's expectations concerning the major objectives of the project?** The project manager and project sponsor must understand the objectives of the project to address Y2K vulnerabilities effectively. This documentation may be in the form of a memorandum of understanding or a task order to create a Y2K project. *NEI/NUSMG 97-07, §4.4*
G	G	G	8	**Has the project manager obtained written agreement from the project sponsor regarding the project objectives and the approach to be taken?** The project sponsor should have approved the documented understanding. If the project sponsor has not approved the understanding about the project objectives, this could impact project schedules and milestones negatively. *NEI/NUSMG 97-07, §4.4*
G	G	G	9	**Is there appropriate expertise on the project team for addressing each Y2K problem?** Licensees typically use system owners, subject matter experts (SMEs), information technology professionals, and personnel from support organizations such as engineering and licensing. Some licensees also use consultants and contractors. Use of this diverse set of personnel ensures that each system and application is addressed appropriately. Subject matter experts are often system engineers, senior engineers, or personnel directly involved in the operation and maintenance of a system or piece of equipment. Consultants and contractors are often employed to perform testing and remediation activities, or to assist in developing the inventory of software applications and embedded components requiring remediation. *NEI/NUSMG 97-07, §4.5*
G	G	G	10	**Does the licensee have a project management plan that documents the approach to be used to address Y2K issues at the facility?** A project management plan indicates a commitment by the licensee to fully address Y2K issues in a systematic manner. This question leads into the following set of questions regarding the licensee's approach to resolving Y2K problems at the facility. *NEI/NUSMG 97-07, §4.6*
			11	**Does the management plan describe the strategies used to address or establish:** *NEI/NUSMG 97-07, §4.6*
G	G	G	a.	**Ownership of software changes?** Software changes should be controlled through the licensee's software configuration management plan.

YES	NO	N/A		
G	G	G	**b.**	**Vendor relationships and responsibilities?**
G	G	G	**c.**	**Communication and feedback from affected parties?**
G	G	G	**d.**	**Contingency plans for unanticipated events during the date rollover into January 1, 2000?**
G	G	G	**12**	**Does the project manager provide status reports to the project sponsor and other members of management?** These reports should include details of key performance indicators such as numbers of systems addressed, expenditures, the current disposition of resources in the field, and schedule status. *NEI/NUSMG 97-07, §4.7*
G	G	G	**13**	**Does management receive status reports on a monthly or more frequent interval?** For example, providing a semiannual status report of Y2K activities to upper management would not be appropriate because additional resources (for example) could not be allocated in a timely manner. *NEI/NUSMG 97-07, §4.7*
G	G	G	**14**	**Has the project manager established interfaces to other organizations (electric utilities, telecommunications utilities, suppliers, emergency services, government offices, etc) that could affect the objectives of the Y2K project?** *NEI/NUSMG 97-07, §4.8*
G	G	G	**15**	**Is each of the interfaces addressed to ensure that the responsible organization is also addressing Y2K problems appropriately?** *NEI/NUSMG 97-07, §4.8*
			16	Quality assurance measures should be applied throughout the Y2K effort to include both the management and the implementation activities. These measures should be structured to ensure that the performance of essential activities is supported by objective evidence. **Do the licensee's measures ensure:** *NEI/NUSMG 97-07, §4.11*
G	G	G	**a.**	**Personnel participating in the Y2K project are qualified for the assigned tasks?**
G	G	G	**b.**	**Activities that could affect safety or operability are accomplished using appropriate procedures?**
G	G	G	**17**	**Is the project on schedule to be completed by July 1, 1999?** This can be determined by reviewing the Project Performance Reports. It is likely the project is not on schedule if the project milestones are not being met. *NRC GL 98-01*
G	G	G	**18**	**If the project is not on schedule, has the licensee taken actions to get back on schedule?** These actions may or may not have required senior management involvement. *NRC GL 98-01*

DOCUMENTATION *NEI/NUSMG 97-07 §8*

Documentation of Y2K program activities serves several important purposes:

- Provide management's expectations and guidance on the conduct of the project,
- Collect the data needed to monitor and manage the progress of the project,
- Allow independent parties to review the project during and after completion,
- Record the basis of the ready or compliance certification.
- Record the justification for leaving an application "as-is" but neither compliant or ready, and
- Record utility management and technical decisions in the event of litigation.

YES	NO	N/A		
G	G	G	20	**Did the licensee use existing software quality assurance (SQA) and configuration management procedures as primary records of change control?** *NEI/NUSMG 97-07 §8*
				Documentation Requirements
YES	NO	N/A	21	**Did the licensee record the disposition of each item in their inventory?** *NEI/NUSMG 97-07 §8.1*
G	G	G		
			22	**Do the records support:** *NEI/NUSMG 97-07 §8.1*
YES	NO	N/A	a.	**Information retrieval activities?**
G	G	G		
YES	NO	N/A	b.	**Auditing activities?**
G	G	G		
YES	NO	N/A	c.	**Oversight activities?**
G	G	G		
				Checklists for Initial and Detailed Assessments *NEI/NUSMG 97-07 §8.5*
YES	NO	N/A	23	**For each software application and embedded component, did the licensee use checklists indicating progress through each step in the Y2K project?** *NEI/NUSMG 97-07 §8.5*
G	G	G		
YES	NO	N/A	24	**Was the checklist reviewed and completed by the business subjent matter expert and the technical team members who were responsible for supporting the item?** *NEI/NUSMG 97-07 §8.5*
G	G	G		
YES	NO	N/A	25	**Is the checklist structured such that the responsible persons are led through the entire process in a manner that helps them properly evaluate the items and record their responses and comments to specific questions?** *NEI/NUSMG 97-07 §8.5 & Appendix H*
G	G	G		

IMPLEMENTATION PLANS *NEI/NUSMG 97-07, §5*

The project team should have developed a project plan that defines the process and methods used to implement the requirements of the management plan. The implementation plans for the project should be approved by appropriate levels of management (e.g., project manager and project sponsor). The project plan should address awareness activities, initial assessment activities, detailed assessment activities, remediation activities, Y2K testing and validation activities, and notification activities. Existing licensee quality assurance measures should be applied to all activities. The following questions address these activities.

Awareness

30 The purpose of initial communications is to raise general awareness of the issue and to communicate its importance to the organization. The communication or indoctrination must be aligned to the audience. **Does the licensee's audience include:** *NEI/NUSMG 97-07, §5.1*

YES	NO	N/A		
G	G	G	**a.**	**Management?**
G	G	G	**b.**	**Subject matter experts?**
G	G	G	**c.**	**System engineers?**
G	G	G	**d.**	**Software or system sponsors?**
G	G	G	**e.**	**General employees?**
G	G	G	**f.**	**Support organizations such as procurement and engineering programs?**

31 **In carrying out the Communications plan, did the licensee describe:** *NEI/NUSMG 97-07, §5.1*

YES	NO	N/A		
G	G	G	**a.**	**The Y2K problem?**
G	G	G	**b.**	**The process or plans to address and remediate Y2K problems?**
G	G	G	**c.**	**The significance or priority of the problem?**
G	G	G	**d.**	**The resources and schedule?**

INITIAL ASSESSMENT *NEI/NUSMG 97-07, §5.2*

In the initial assessment phase, the licensee identifies software and embedded systems in use by the plant. The initial assessment consists of performing an inventory, screening for Y2K impact, categorizing the inventoried items, classifying the items to reflect their importance, prioritizing the items for detailed assessment, and performing an analysis of the initial assessment to determine the scope, schedule, and estimated resources required for the detailed assessment.

YES	NO	N/A		
G	G	G	40	**Does the licensee maintain a record of each inventoried item?** The licensee should be maintaining an inventory in some form of a database that provides a record of software application or embedded component name, version or model number, description and use, priority based on importance to safety, operability, regulatory commitments, business considerations, etc., vendor or manufacturer, and owner or support group responsible for the item. *NEI/NUSMG 97-07, §5.2.1*
			41	**In developing the inventory, did the licensee:** *NEI/NUSMG 97-07, §5.2.1*
YES	NO	N/A	a.	**Search procedures and documentation for the occurrence of phrases that would indicate the existence of an internal clock or processor?**
G	G	G		
YES	NO	N/A	b.	**Survey vendors for information about their equipment?**
G	G	G		
YES	NO	N/A	c.	**Perform system walkdowns?**
G	G	G		
YES	NO	N/A	d.	**Review schematics, program listings, and reference manuals?**
G	G	G		
			42	**Does the licensee's guidance for performing the inventory include:** *NEI/NUSMG 97-07, §5.2.1*
YES	NO	N/A	a.	**The types of items to list?**
G	G	G		
YES	NO	N/A	b.	**The use of existing inventories?**
G	G	G		
YES	NO	N/A	c.	**Information required for future actions and decisions?**
G	G	G		
				Categorization *NEI/NUSMG 97-07, §5.2.2*
YES	NO	N/A	43	**Did the licensee categorize the inventoried software and embedded systems equipment?** Categorization is the process that groups software and embedded systems to allow management to assign resources to the classification and prioritization activities. Examples of categories are mainframe applications, system software, client/server applications, telecommunications equipment, process systems equipment, test equipment, and software interfaces. *NEI/NUSMG 97-07, §5.2.2*
G	G	G		
				Classification *NEI/NUSMG 97-07, §5.2.3*

44 After the inventory is categorized, each item within each category should be classified to reflect the importance of the item. Without some form of classification methodology, the licensee may not be able to perform detailed assessment activities for the most important items before the June 30, 1999, deadline. **Does the licensee's classification process address classifications such as:** *NEI/NUSMG 97-07, §5.2.4*

YES	NO	N/A		
G	G	G	**a.**	**Safety-related?**
G	G	G	**b.**	**Important-to-safety?**
G	G	G	**c.**	**Regulatory requirements?**
G	G	G	**d.**	**Licensee commitments?**
G	G	G	**e.**	**Important to operations?**
G	G	G	**f.**	**Personnel safety?**
G	G	G	**g.**	**Continuity of business?**
G	G	G	**h.**	**Non-essential?**

Prioritization *NEI/NUSMG 97-07, §5.2.4*

Prioritization is the process of reviewing all items within the inventory after classification and assigning an order to the performance of the detailed assessment. Examples of prioritization criteria are risk, the number of systems of a given type, the availability of personnel with the required experience, and competing schedules such as equipment replacement and outages.

YES	NO	N/A		
G	G	G	**45**	**Did the licensee describe in their project plan the criteria to be used to prioritize detailed assessment activities?** *NEI/NUSMG 97-07, §5.2.4*

CONFIRMATION OF Y2K PROJECT IMPLEMENTATION ACTIVITIES

In the following identical sets questions, the reviewer should use as a basis for their review a remediated application or embedded component from the reactor protection system or engineered safety features systems (RPS/ESF), the feedwater system or the balance of plant systems (FWS/BOP), the radiation monitoring system (RMS), the emergency sirens (ENS), the plant process computer (PPC), and the plant security system (PSS). It is recognized that some reactor protection systems may not have any software applications or embedded components that process date-related information. However, the RPS was included here because of its importance to safety.

Most licensees maintain a list of software applications and embedded components in an electronic database. Request a printed copy of this database, an electronic copy of the database in a format supported by the NRC, or request read-only access to the database. Using the database, select a software application or embedded component for each of the above named applications (i.e., RPS/ESF, FWS/BOP, RMS, ENS, PPC, and PSS). The selected software applications and embedded components should have been determined by the licensee to be Y2K susceptible. The associated remediation activities should have been completed, and the software applications and embedded components should be declared Y2K ready or compliant. The reviewer should then request from the Y2K Project Manager all of the Y2K package documentation for each of the software applications and embedded components selected.

As an initial check, ensure the documentation in the package is consistent with the documentation required in the licensee's Y2K Project Plan. Many project plans provide a list of deliverables for each software application and embedded component package. Use this list to facilitate the cross check.

Once you've verified the package is complete, proceed to the following questions.

REACTOR PROTECTION SYSTEM OR ENGINEERED SAFETY SYSTEM SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software Application/Embedded Component Name? _____

Model Number? _____

INITIAL ASSESSMENT OF SPECIFIC SOFTWARE APPLICATION OR EMBEDDED COMPONENT

YES	NO	N/A		
G	G	G	**100**	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*

Analysis of Initial Assessment

YES	NO	N/A		
G	G	G	**101**	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*

DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A		
G	G	G	**120**	The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. **Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** *NEI/NUSMG 97-07, §5.3*

Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

Vendor Evaluations *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	**121**	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	**122**	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	**123**	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	124	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*
				Utility Owned or Supported Software Application or Embedded Component Evaluations *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	125	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	126	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*
				Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*
YES	NO	N/A	127	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*
				Remediation Planning *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	128	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*
			129	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	a.	**Options evaluated?**
YES	NO	N/A	b.	**Schedule?**
YES	NO	N/A	c.	**Benefits?**
YES	NO	N/A	d.	**Risks?**

REMEDIATION *NEI/NUSMG 97-07, §5.4*

140 The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase. **Did the licensee:** *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A		
G	G	G	**a.**	**Track the progress of the remediation activity?**
G	G	G	**b.**	**Document the risk evaluation?**
G	G	G	**c.**	**Follow existing software quality assurance procedures?**
G	G	G	**d.**	**Follow existing station modification procedures?**
G	G	G	**e.**	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*

Software Application or Embedded Component Contingency Plan

YES	NO	N/A		
G	G	G	**141**	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*

142 **Did the contingency plan include:** *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A		
G	G	G	**a.**	**An inventory number or other unique identifier?**
G	G	G	**b.**	**A description of the risk?**
G	G	G	**c.**	**Identification of the subject matter expert?**
G	G	G	**d.**	**Event analysis?**
G	G	G	**e.**	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**
G	G	G	**f.**	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.
G	G	G	**g.**	**Period of vulnerability?**
G	G	G	**h.**	**Priority?**
G	G	G	**i.**	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.

YES	NO	N/A		
G	G	G	**j.**	**Resources?**
G	G	G	**k.**	**Implementation timing?**
G	G	G	**l.**	**If needed, an exit strategy?**
G	G	G	**m.**	**Training requirements?**
G	G	G	**n.**	**Requirements for special Y2K procedures?**
G	G	G	**o.**	**Identification and documentation of verification?**
G	G	G	**p.**	**Management approval?**
G	G	G	**143**	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*

Y2K TESTING AND VALIDATION *NEI/NUSMG 97-07, §5.5*

The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component.

YES	NO	N/A		
G	G	G	**160**	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 98-07, §5.5*
			161	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 98-07, §5.5, Appendix E*
G	G	G	**a.**	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.
G	G	G	**b.**	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YY, or any of the other common formats currently used that incorporate date, month, and year.

YES	NO	N/A		
G	G	G	c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.
G	G	G	d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer is restarted and the software application or embedded component is tested to confirm it continues to operate correctly.
G	G	G	e.	**Year 2000 Rollover Gregorian Cold?**
G	G	G	f.	**Year 2000 Julian Rollover Cold?**
G	G	G	g.	**Year 2000 Leap Year Rollover Warm?**
G	G	G	h.	**Year 2000 Leap Year Rollover Gregorian Warm?**
G	G	G	i.	**Year 2000 Leap Year Rollover Julian Warm?**
G	G	G	j.	**Year 2000 Leap Year Rollover Cold?**
G	G	G	k.	**Year 2000 Leap Year Rollover Gregorian Cold?**
G	G	G	l.	**Year 2000 Leap Year Rollover Julian Cold?**
G	G	G	m.	**High Risk Date 9/9/99?**
G	G	G	n.	**Date Integrity 2/29/01?**
G	G	G	162	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*
G	G	G	163	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*

NOTIFICATION *NEI/NUSMG 97-07 §5.6*

YES	NO	N/A		
G	G	G	**180**	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*
G	G	G	**181**	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*

FEEDWATER SYSTEM OR BALANCE OF PLANT
SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software Application/Embedded Component Name? _____

Model Number? _____

INITIAL ASSESSMENT OF SPECIFIC SOFTWARE APPLICATION OR EMBEDDED COMPONENT

YES	NO	N/A		
G	G	G	**200**	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*

Analysis of Initial Assessment

YES	NO	N/A		
G	G	G	**201**	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*

DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A		
G	G	G	**220**	The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. **Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** *NEI/NUSMG 97-07, §5.3*

Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

Vendor Evaluations *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	**221**	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	**222**	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	**223**	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	224	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*
				Utility Owned or Supported Software Application or Embedded Component Evaluations *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	225	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	226	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*
				Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*
YES	NO	N/A	227	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*
				Remediation Planning *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	228	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*
			229	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	a.	**Options evaluated?**
YES	NO	N/A	b.	**Schedule?**
YES	NO	N/A	c.	**Benefits?**
YES	NO	N/A	d.	**Risks?**

REMEDIATION *NEI/NUSMG 97-07, §5.4*

240 The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase. **Did the licensee:** *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A		
G	G	G	**a.**	**Track the progress of the remediation activity?**
G	G	G	**b.**	**Document the risk evaluation?**
G	G	G	**c.**	**Follow existing software quality assurance procedures?**
G	G	G	**d.**	**Follow existing station modification procedures?**
G	G	G	**e.**	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*

Software Application or Embedded Component Contingency Plan

YES	NO	N/A		
G	G	G	**241**	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*

242 **Did the contingency plan include:** *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A		
G	G	G	**a.**	**An inventory number or other unique identifier?**
G	G	G	**b.**	**A description of the risk?**
G	G	G	**c.**	**Identification of the subject matter expert?**
G	G	G	**d.**	**Event analysis?**
G	G	G	**e.**	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**
G	G	G	**f.**	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.
G	G	G	**g.**	**Period of vulnerability?**
G	G	G	**h.**	**Priority?**
G	G	G	**i.**	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.

YES	NO	N/A		
G	G	G	**j.**	**Resources?**
G	G	G	**k.**	**Implementation timing?**
G	G	G	**l.**	**If needed, an exit strategy?**
G	G	G	**m.**	**Training requirements?**
G	G	G	**n.**	**Requirements for special Y2K procedures?**
G	G	G	**o.**	**Identification and documentation of verification?**
G	G	G	**p.**	**Management approval?**
G	G	G	**243**	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*

Y2K TESTING AND VALIDATION *NEI/NUSMG 97-07, §5.5*

The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component.

YES	NO	N/A		
G	G	G	**260**	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 98-07, §5.5*
			261	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 98-07, §5.5, Appendix E*
G	G	G	**a.**	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.
G	G	G	**b.**	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YY, or any of the other common formats currently used that incorporate date, month, and year.

YES	NO	N/A		
G	G	G	c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.
G	G	G	d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer restarted and the software application or embedded component is tested to confirm it continues to operate correctly.
G	G	G	e.	**Year 2000 Rollover Gregorian Cold?**
G	G	G	f.	**Year 2000 Julian Rollover Cold?**
G	G	G	g.	**Year 2000 Leap Year Rollover Warm?**
G	G	G	h.	**Year 2000 Leap Year Rollover Gregorian Warm?**
G	G	G	i.	**Year 2000 Leap Year Rollover Julian Warm?**
G	G	G	j.	**Year 2000 Leap Year Rollover Cold?**
G	G	G	k.	**Year 2000 Leap Year Rollover Gregorian Cold?**
G	G	G	l.	**Year 2000 Leap Year Rollover Julian Cold?**
G	G	G	m.	**High Risk Date 9/9/99?**
G	G	G	n.	**Date Integrity 2/29/01?**
G	G	G	262	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*
G	G	G	263	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*

NOTIFICATION *NEI/NUSMG 97-07 §5.6*

YES	NO	N/A		
G	G	G	**280**	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*
G	G	G	**281**	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*

RADIATION MONITORING SYSTEM SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software Application/Embedded Component Name? _____

Model Number? _____

INITIAL ASSESSMENT OF SPECIFIC SOFTWARE APPLICATION OR EMBEDDED COMPONENT

YES	NO	N/A		
G	G	G	300	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*

Analysis of Initial Assessment

YES	NO	N/A		
G	G	G	301	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*

DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A		
G	G	G	320	The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. **Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** *NEI/NUSMG 97-07, §5.3*

Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

Vendor Evaluations *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	321	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	322	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	323	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	324	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*
				Utility Owned or Supported Software Application or Embedded Component Evaluations *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	325	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	326	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*
				Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*
YES	NO	N/A	327	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*
				Remediation Planning *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	328	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*
			329	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	a.	**Options evaluated?**
YES	NO	N/A	b.	**Schedule?**
YES	NO	N/A	c.	**Benefits?**
YES	NO	N/A	d.	**Risks?**

REMEDIATION *NEI/NUSMG 97-07, §5.4*

340 The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase. **Did the licensee:** *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A		
G	G	G	**a.**	**Track the progress of the remediation activity?**
G	G	G	**b.**	**Document the risk evaluation?**
G	G	G	**c.**	**Follow existing software quality assurance procedures?**
G	G	G	**d.**	**Follow existing station modification procedures?**
G	G	G	**e.**	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*

Software Application or Embedded Component Contingency Plan

YES	NO	N/A		
G	G	G	**341**	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*

342 **Did the contingency plan include:** *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A		
G	G	G	**a.**	**An inventory number or other unique identifier?**
G	G	G	**b.**	**A description of the risk?**
G	G	G	**c.**	**Identification of the subject matter expert?**
G	G	G	**d.**	**Event analysis?**
G	G	G	**e.**	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**
G	G	G	**f.**	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.
G	G	G	**g.**	**Period of vulnerability?**
G	G	G	**h.**	**Priority?**
G	G	G	**i.**	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.

YES	NO	N/A		
G	G	G	**j.**	**Resources?**
G	G	G	**k.**	**Implementation timing?**
G	G	G	**l.**	**If needed, an exit strategy?**
G	G	G	**m.**	**Training requirements?**
G	G	G	**n.**	**Requirements for special Y2K procedures?**
G	G	G	**o.**	**Identification and documentation of verification?**
G	G	G	**p.**	**Management approval?**
G	G	G	**343**	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*

Y2K TESTING AND VALIDATION *NEI/NUSMG 97-07, §5.5*

The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component.

YES	NO	N/A		
G	G	G	**360**	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 98-07, §5.5*
			361	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 98-07, §5.5, Appendix E*
G	G	G	**a.**	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.
G	G	G	**b.**	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YY, or any of the other common formats currently used that incorporate date, month, and year.

YES	NO	N/A		
G	G	G	c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.
G	G	G	d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer restarted and the software application or embedded component is tested to confirm it continues to operate correctly.
G	G	G	e.	**Year 2000 Rollover Gregorian Cold?**
G	G	G	f.	**Year 2000 Julian Rollover Cold?**
G	G	G	g.	**Year 2000 Leap Year Rollover Warm?**
G	G	G	h.	**Year 2000 Leap Year Rollover Gregorian Warm?**
G	G	G	i.	**Year 2000 Leap Year Rollover Julian Warm?**
G	G	G	j.	**Year 2000 Leap Year Rollover Cold?**
G	G	G	k.	**Year 2000 Leap Year Rollover Gregorian Cold?**
G	G	G	l.	**Year 2000 Leap Year Rollover Julian Cold?**
G	G	G	m.	**High Risk Date 9/9/99?**
G	G	G	n.	**Date Integrity 2/29/01?**
G	G	G	362	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*
G	G	G	363	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*

NOTIFICATION *NEI/NUSMG 97-07 §5.6*

YES	NO	N/A		
G	G	G	**380**	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*
YES	**NO**	**N/A**	**381**	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*
G	G	G		

EMERGENCY SIRENS SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software Application/Embedded Component Name? _____

Model Number? _____

INITIAL ASSESSMENT OF SPECIFIC SOFTWARE APPLICATION OR EMBEDDED COMPONENT

YES	NO	N/A		
G	G	G	400	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*

Analysis of Initial Assessment

YES	NO	N/A		
G	G	G	401	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*

DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A		
G	G	G	420	The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. **Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** *NEI/NUSMG 97-07, §5.3*

Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

Vendor Evaluations *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	421	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	422	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	423	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	424	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*
				Utility Owned or Supported Software Application or Embedded Component Evaluations *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	425	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	426	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*
				Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*
YES	NO	N/A	427	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*
				Remediation Planning *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	428	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*
			429	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	a.	**Options evaluated?**
YES	NO	N/A	b.	**Schedule?**
YES	NO	N/A	c.	**Benefits?**
YES	NO	N/A	d.	**Risks?**

REMEDIATION *NEI/NUSMG 97-07, §5.4*

440 The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase. **Did the licensee:** *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A		
G	G	G	**a.**	**Track the progress of the remediation activity?**
G	G	G	**b.**	**Document the risk evaluation?**
G	G	G	**c.**	**Follow existing software quality assurance procedures?**
G	G	G	**d.**	**Follow existing station modification procedures?**
G	G	G	**e.**	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*

Software Application or Embedded Component Contingency Plan

YES	NO	N/A		
G	G	G	**441**	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*

442 **Did the contingency plan include:** *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A		
G	G	G	**a.**	**An inventory number or other unique identifier?**
G	G	G	**b.**	**A description of the risk?**
G	G	G	**c.**	**Identification of the subject matter expert?**
G	G	G	**d.**	**Event analysis?**
G	G	G	**e.**	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**
G	G	G	**f.**	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.
G	G	G	**g.**	**Period of vulnerability?**
G	G	G	**h.**	**Priority?**
G	G	G	**i.**	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.

YES	NO	N/A		
G	G	G	**j.**	**Resources?**
G	G	G	**k.**	**Implementation timing?**
G	G	G	**l.**	**If needed, an exit strategy?**
G	G	G	**m.**	**Training requirements?**
G	G	G	**n.**	**Requirements for special Y2K procedures?**
G	G	G	**o.**	**Identification and documentation of verification?**
G	G	G	**p.**	**Management approval?**
G	G	G	**443**	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*

Y2K TESTING AND VALIDATION *NEI/NUSMG 97-07, §5.5*

The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component.

YES	NO	N/A		
G	G	G	**460**	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 98-07, §5.5*
			461	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 98-07, §5.5, Appendix E*
G	G	G	**a.**	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.
G	G	G	**b.**	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YY, or any of the other common formats currently used that incorporate date, month, and year.

YES	NO	N/A		
G	G	G	c.	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.
G	G	G	d.	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer restarted and the software application or embedded component is tested to confirm it continues to operate correctly.
G	G	G	e.	**Year 2000 Rollover Gregorian Cold?**
G	G	G	f.	**Year 2000 Julian Rollover Cold?**
G	G	G	g.	**Year 2000 Leap Year Rollover Warm?**
G	G	G	h.	**Year 2000 Leap Year Rollover Gregorian Warm?**
G	G	G	i.	**Year 2000 Leap Year Rollover Julian Warm?**
G	G	G	j.	**Year 2000 Leap Year Rollover Cold?**
G	G	G	k.	**Year 2000 Leap Year Rollover Gregorian Cold?**
G	G	G	l.	**Year 2000 Leap Year Rollover Julian Cold?**
G	G	G	m.	**High Risk Date 9/9/99?**
G	G	G	n.	**Date Integrity 2/29/01?**
G	G	G	462	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*
G	G	G	463	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*

NOTIFICATION *NEI/NUSMG 97-07 §5.6*

YES	NO	N/A		
G	G	G	**480**	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*
G	G	G	**481**	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*

PLANT PROCESS COMPUTER SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software Application/Embedded Component Name? _____

Model Number? _____

INITIAL ASSESSMENT OF SPECIFIC SOFTWARE APPLICATION OR EMBEDDED COMPONENT

YES	NO	N/A		
G	G	G	**500**	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*

Analysis of Initial Assessment

YES	NO	N/A		
G	G	G	**501**	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*

DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A		
G	G	G	**520**	The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. **Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** *NEI/NUSMG 97-07, §5.3*

Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

Vendor Evaluations *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	**521**	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	**522**	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	**523**	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	524	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*
				Utility Owned or Supported Software Application or Embedded Component Evaluations *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	525	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	526	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*
				Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*
YES	NO	N/A	527	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*
				Remediation Planning *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	528	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*
			529	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	a.	**Options evaluated?**
YES	NO	N/A	b.	**Schedule?**
YES	NO	N/A	c.	**Benefits?**
YES	NO	N/A	d.	**Risks?**

REMEDIATION *NEI/NUSMG 97-07, §5.4*

540 The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase. **Did the licensee:** *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A		
G	G	G	**a.**	**Track the progress of the remediation activity?**
G	G	G	**b.**	**Document the risk evaluation?**
G	G	G	**c.**	**Follow existing software quality assurance procedures?**
G	G	G	**d.**	**Follow existing station modification procedures?**
G	G	G	**e.**	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*

Software Application or Embedded Component Contingency Plan

YES	NO	N/A		
G	G	G	**541**	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*

542 **Did the contingency plan include:** *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A		
G	G	G	**a.**	**An inventory number or other unique identifier?**
G	G	G	**b.**	**A description of the risk?**
G	G	G	**c.**	**Identification of the subject matter expert?**
G	G	G	**d.**	**Event analysis?**
G	G	G	**e.**	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**
G	G	G	**f.**	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.
G	G	G	**g.**	**Period of vulnerability?**
G	G	G	**h.**	**Priority?**
G	G	G	**i.**	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.

YES	NO	N/A		
G	G	G	**j.**	**Resources?**
G	G	G	**k.**	**Implementation timing?**
G	G	G	**l.**	**If needed, an exit strategy?**
G	G	G	**m.**	**Training requirements?**
G	G	G	**n.**	**Requirements for special Y2K procedures?**
G	G	G	**o.**	**Identification and documentation of verification?**
G	G	G	**p.**	**Management approval?**
G	G	G	**543**	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*

Y2K TESTING AND VALIDATION *NEI/NUSMG 97-07, §5.5*

The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component.

YES	NO	N/A		
G	G	G	**560**	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 98-07, §5.5*
			561	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 98-07, §5.5, Appendix E*
G	G	G	**a.**	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.
G	G	G	**b.**	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YY, or any of the other common formats currently used that incorporate date, month, and year.

YES	NO	N/A		
G	G	G	**c.**	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.
G	G	G	**d.**	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer restarted and the software application or embedded component is tested to confirm it continues to operate correctly.
G	G	G	**e.**	**Year 2000 Rollover Gregorian Cold?**
G	G	G	**f.**	**Year 2000 Julian Rollover Cold?**
G	G	G	**g.**	**Year 2000 Leap Year Rollover Warm?**
G	G	G	**h.**	**Year 2000 Leap Year Rollover Gregorian Warm?**
G	G	G	**i.**	**Year 2000 Leap Year Rollover Julian Warm?**
G	G	G	**j.**	**Year 2000 Leap Year Rollover Cold?**
G	G	G	**k.**	**Year 2000 Leap Year Rollover Gregorian Cold?**
G	G	G	**l.**	**Year 2000 Leap Year Rollover Julian Cold?**
G	G	G	**m.**	**High Risk Date 9/9/99?**
G	G	G	**n.**	**Date Integrity 2/29/01?**
G	G	G	**562**	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*
G	G	G	**563**	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*

NOTIFICATION *NEI/NUSMG 97-07 §5.6*

YES	NO	N/A		
G	G	G	**580**	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*
YES	**NO**	**N/A**	**581**	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*
G	G	G		

PLANT SECURITY SYSTEM SOFTWARE APPLICATION OR EMBEDDED COMPONENT

Software Application/Embedded Component Name? _____

Model Number? _____

INITIAL ASSESSMENT OF SPECIFIC SOFTWARE APPLICATION OR EMBEDDED COMPONENT

YES	NO	N/A		
G	G	G	600	**For multi-unit sites, are the prioritizations for the same software application or embedded component consistent between units?** Inconsistencies in prioritizations indicate that some personnel may misunderstand the prioritization process. *NRC Audit Experience*

Analysis of Initial Assessment

YES	NO	N/A		
G	G	G	601	**Did the licensee use the results of the categorization and prioritization steps to determine the scope, schedule, and estimated resources required for the detailed assessment?** *NEI/NUSMG 97-07, §5.2.5*

DETAILED ASSESSMENT *NEI/NUSMG 97-07, §5.3*

YES	NO	N/A		
G	G	G	620	The purpose of detailed assessment is to obtain sufficient information about each inventoried item to determine its expected performance beyond December 31, 1999. Documentation and quality assurance are required in this process. Assessment results are used by management to prescribe actions to ensure continued operation of the software and embedded systems. **Did the licensee develop written instructions, checklists, or test procedures to implement the detailed assessment process?** *NEI/NUSMG 97-07, §5.3*

Several activities occur during the detailed assessment phase. These activities address evaluations of vendor software and embedded systems, utility owned or supported software and embedded systems, evaluations of interfaces between the software applications and embedded systems modified by the Y2K project and those maintained by other internal and external organizations, and decisions regarding remediating or replacing software and embedded systems that may be susceptible to Y2K-related dates.

Vendor Evaluations *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	621	**Did the licensee determine that the detailed evaluation of the software or embedded component in question is the responsibility of the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	622	**Did the licensee provide a generic Y2K compliance specification to the vendor?** *NEI/NUSMG 97-07, §5.3.1*
G	G	G	623	**Does the licensee intend to use the generic specification in future purchases of this software application or embedded component?** Future purchase contracts should ensure that replacement software applications or embedded components are Y2K compliant. *NEI/NUSMG 97-07, §5.3.1*

YES	NO	N/A		
G	G	G	624	**Did the licensee confirm the vendor's certification information with confirmatory testing or evaluations for vendors who are not on the licensee's Approved Supplier List?** Confirmatory testing or evaluations of software applications or embedded components by licensees have shown there are several vendors who have inappropriately certified software applications or embedded components to be Y2K ready or compliant. *NEI/NUSMG 97-07, §5.3.1*
				Utility Owned or Supported Software Application or Embedded Component Evaluations *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	625	**Did the licensee use written instructions, test procedures, or checklists for performing a detailed assessment of the software application or embedded component?** Consistency in performing a detailed assessment ensures each software application or embedded component is thoroughly evaluated. *NEI/NUSMG 97-07, §5.3.2*
YES	NO	N/A	626	**Did the licensee ensure that all components in a class of components are identical?** There have been instances in other industries in which two or more software applications or embedded components with the same nameplate data were not consistently Y2K compliant because the manufacturer changed the chips or software but did not change the nameplate data. *Industry Experience*
				Interface Evaluation *NEI/NUSMG 97-07, §5.3.3*
YES	NO	N/A	627	**Did the licensee coordinate interfaces between the software application or embedded component modified by the Y2K project and software applications or embedded components maintained by other internal or external organizations?** Failure to coordinate these interfaces could result in a disruption of information flow into or out of the software application or embedded component being remediated. For example, if an embedded component output variable format is changed from a two-digit value to a four-digit value and the interfacing system is not changed to accept four-digit values, both systems may be Y2K compliant, but they may fail to operate because the data interface cannot accept the new value format. *NEI/NUSMG 97-07, §5.3.3*
				Remediation Planning *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	628	**Did the licensee document its decision regarding planned remediation, using as-is, retirement, or replacement of the affected software application or embedded component?** *NEI/NUSMG 97-07, §5.3.4*
			629	**Does the licensee's documentation address:** *NEI/NUSMG 97-07, §5.3.4*
YES	NO	N/A	a.	**Options evaluated?**
YES	NO	N/A	b.	**Schedule?**
YES	NO	N/A	c.	**Benefits?**
YES	NO	N/A	d.	**Risks?**

REMEDIATION *NEI/NUSMG 97-07, §5.4*

640 The purpose of remediation is to retire, replace, or modify software applications or embedded components (including work-arounds) identified in the detailed assessment phase. **Did the licensee:** *NEI/NUSMG 97-07, §5.4*

YES	NO	N/A		
G	G	G	**a.**	**Track the progress of the remediation activity?**
G	G	G	**b.**	**Document the risk evaluation?**
G	G	G	**c.**	**Follow existing software quality assurance procedures?**
G	G	G	**d.**	**Follow existing station modification procedures?**
G	G	G	**e.**	**Perform regulatory reviews and/or evaluations depending on the classification of the system?** *NEI/NUSMG 97-07, §7.0*

Software Application or Embedded Component Contingency Plan

YES	NO	N/A		
G	G	G	**641**	**Did the licensee develop an individual software application or embedded component contingency plan?** When the licensee determines there may be a risk of a Y2K-induced event in a software application or embedded component, the next step is to develop an individual software application or embedded component contingency plan that addresses that risk. *NEI/NUSMG 98-07, §4.2*

642 **Did the contingency plan include:** *NEI/NUSMG 98-07, §4.2*

YES	NO	N/A		
G	G	G	**a.**	**An inventory number or other unique identifier?**
G	G	G	**b.**	**A description of the risk?**
G	G	G	**c.**	**Identification of the subject matter expert?**
G	G	G	**d.**	**Event analysis?**
G	G	G	**e.**	**Based on the results of the above analyses, has the licensee identified alternate remediation strategies?**
G	G	G	**f.**	**Has the licensee developed criteria for initiating the alternate remediation strategy?** For example, schedule constraints and system complexity will be key factors in establishing the initiation date.
G	G	G	**g.**	**Period of vulnerability?**
G	G	G	**h.**	**Priority?**
G	G	G	**i.**	**Risk mitigation strategy and actions?** For example, if replacement is the selected remediation strategy, the risk of late delivery should be considered.

YES	NO	N/A		
G	G	G	**j.**	**Resources?**
G	G	G	**k.**	**Implementation timing?**
G	G	G	**l.**	**If needed, an exit strategy?**
G	G	G	**m.**	**Training requirements?**
G	G	G	**n.**	**Requirements for special Y2K procedures?**
G	G	G	**o.**	**Identification and documentation of verification?**
G	G	G	**p.**	**Management approval?**
G	G	G	**643**	**Is the individual contingency plan subject to appropriate elements of the licensee's Y2K readiness program, such as quality assurance, management reviews, and document retention?** *NEI/NUSMG 98-07, §4.2*

Y2K TESTING AND VALIDATION *NEI/NUSMG 97-07, §5.5*

The purpose of Y2K testing in support of evaluation efforts is to determine whether the Y2K problem is present in the software application or embedded component. This testing is performed during the detailed assessment phase. The purpose of Y2K testing after remediation is to determine whether the remediation efforts have eliminated the Y2K problem and have not introduced errors or unintended functions into the software application or embedded component.

YES	NO	N/A		
G	G	G	**660**	**Did the licensee perform Y2K testing after the software application or embedded component was remediated?** *NEI/NUSMG 98-07, §5.5*
			661	**In the determination of Y2K readiness or compliance, did the licensee test the following critical dates:** *NEI/NUSMG 98-07, §5.5, Appendix E*
G	G	G	**a.**	**Year 2000 Rollover Warm?** In a Warm test, the date is set to December 31, 1999, and the time is set to just before midnight. The operation of the software application or embedded component is then observed as the date rolls over to January 1, 2000, to confirm the software application or embedded component continues to operate correctly.
G	G	G	**b.**	**Year 2000 Rollover Gregorian Warm?** The Gregorian representation of a date is the format DD/MM/YY, MM/DD/YY, or any of the other common formats currently used that incorporate date, month, and year.

YES	NO	N/A		
G	G	G	**c.**	**Year 2000 Rollover Julian Warm?** The Julian representation of a date is the format DDD,YY or DDD,YYYY, where DDD is a number from 1 to 365 or 366 depending on whether the year was a leap year or a common year, and YY or YYYY is the two digit or four digit representation of the year. In a system, dates may be stored in Gregorian or Julian representation, or a combination of both. There are also situations where all internal representations and calculations are done using the Julian representation and all external interfaces use the Gregorian representation.
G	G	G	**d.**	**Year 2000 Rollover Cold?** In a Cold test, the date is set to December 31, 1999, and the time is set to just before midnight. The computer is then turned off for a period sufficient to allow the internal clock to advance to January 1, 2000. After this period expires, the computer restarted and the software application or embedded component is tested to confirm it continues to operate correctly.
G	G	G	**e.**	**Year 2000 Rollover Gregorian Cold?**
G	G	G	**f.**	**Year 2000 Julian Rollover Cold?**
G	G	G	**g.**	**Year 2000 Leap Year Rollover Warm?**
G	G	G	**h.**	**Year 2000 Leap Year Rollover Gregorian Warm?**
G	G	G	**i.**	**Year 2000 Leap Year Rollover Julian Warm?**
G	G	G	**j.**	**Year 2000 Leap Year Rollover Cold?**
G	G	G	**k.**	**Year 2000 Leap Year Rollover Gregorian Cold?**
G	G	G	**l.**	**Year 2000 Leap Year Rollover Julian Cold?**
G	G	G	**m.**	**High Risk Date 9/9/99?**
G	G	G	**n.**	**Date Integrity 2/29/01?**
G	G	G	**662**	**Did the licensee validate the software application or embedded component after remediation?** The purpose of validation is to ensure the software application or embedded component is capable of performing its intended function. For vendor responses that indicate an application or device is Y2K ready or compliant, a decision on whether to perform validation testing is required. This decision may be based on the criticality of the item, prior experience with the vendor, the extent of documentation provided, or utility knowledge of the item. *NEI/NUSMG 97-07 §5.5*
G	G	G	**663**	**Did the licensee prepare validation certification and documentation consistent with the requirements of the project?** This certification should clearly indicate Y2K readiness or compliance. *NEI/NUSMG 97-07 §5.5 & §8.5*

NOTIFICATION *NEI/NUSMG 97-07 §5.6*

YES	NO	N/A		
G	G	G	**680**	**Did the licensee notify affected parties, including users and vendors, that changes had been made to the software application or embedded component?** *NEI/NUSMG 97-07 §5.6*
G	G	G	**681**	**Did the changes include changes to the associated software application or embedded component documentation?** *NEI/NUSMG 97-07 §5.6*

CONTINGENCY PLANNING

Effective contingency planning provides a process for reducing the risks associated with Y2K-induced events. Contingency plan elements may be divided into three categories based on the source of the risk. These three categories are remediation risks, internal facility risks, and external risks. The remediation risk category addresses the contingency planning for individual software application and embedded component contingency plans. Issues related to the remediation category are addressed in the above six software application and embedded component reviews. The licensee should have developed an integrated contingency plan from individual contingency plans to mitigate Y2K-induced events that could occur on key rollover dates. Contingency planning issues related to the internal and external contingency planning categories and the integrated contingency plan are addressed in the following sets of questions.

YES	NO	N/A		
G	G	G	**700**	**Does the licensee have a single point or a focus point of contact?** Because of the importance and complexity of contingency planning, the Y2K project manager should consider assigning a single point of contact for contingency planning. Generally, the single point of contact should be somebody with extensive experience in nuclear plant operations, (e.g., a Senior Reactor Operator). *NEI/NUSMG 98-07, §4*

CONTINGENCY PLANNING FOR INTERNAL FACILITY RISKS *NEI/NUSMG 98-07, §6*

The inventory, assessment, and remediation phases of the Y2K project are designed to provide identification and remediation for software applications or embedded components that could degrade, impair, or prevent operability of the plant. However, there remains some risk that digital systems could still be subject to Y2K-induced events that could affect plant operations. The purpose of internal risk contingency planning is to provide a logical approach to anticipate and prepare for such events and reduce their impact on facility operations.

An example of an internal facility risk is a control system that relies upon process computer signals, embedded devices, and complex interfaces to other systems. These relationships become evident in the inventory and assessment process. Based on the importance of this system and its complexities, management may elect to develop an individual contingency plan for it. *NEI/NUSMG 98-07, §6 & Appendix C*

YES	NO	N/A		
G	G	G	**720**	**Do the licensee's internal contingency plans identify failure modes and mitigation strategies?** *NEI/NUSMG 98-07, §6*
G	G	G	**721**	**Did the licensee's contingency planning consider the potential that a problem could result in a common mode failure that could potentially affect many systems or components, including essential infrastructure services?** *NEI/NUSMG 98-07, §4*

Risk Identification for Internal Facility Events *NEI/NUSMG 98-07, §6.1*

722 Risk identification for internal facility events includes a review of the Y2K inventory and assessment results for devices and software. The risk is a function of the short-term challenge to continued facility operation, the complexity of the system, and the degree of remediation that may have been required. **Did the licensee consider:** *NEI/NUSMG 98-07, §6.1*

YES	NO	N/A		
G	G	G	**a.**	**Software applications or embedded components whose failure places the unit at short-term risk for continued operation?**
G	G	G	**b.**	**Systems with multiple, integrated digital control devices or software subsystems?**
G	G	G	**c.**	**Systems that use digital inputs from other systems?**
G	G	G	**d.**	**Systems for which significant remediation effort was required?**

Event Analyses for Internal Facility Events *NEI/NUSMG 98-07, §6.2*

723 Event analysis is used to determine failure modes and their consequences. Analytical processes may include review of existing safety analyses and probability risk assessments (PRA). Simulations and experience-based judgements may be used to understand the implications of failure modes. **For each event, did the licensee consider:** *NEI/NUSMG 98-07, §6.2*

YES	NO	N/A		
G	G	G	**a.**	**Event consequences on safety or operability, including safe shutdown operations?**
G	G	G	**b.**	**The likelihood of the event occurring?**
G	G	G	**c.**	**The importance of the event with regard to the objectives of the facility?**
G	G	G	**d.**	**The time of event occurrence - immediate, delayed, or an unknown time of occurrence?**
G	G	G	**e.**	**The long term effects of the event?**

Risk Management for Internal Facility Events *NEI/NUSMG 98-07, §6.3*

724 Risk management uses the information from event analysis to determine the mitigation strategies that will reduce the effect of a Y2K-induced event. Risk management may also consider interdependencies. **Do the licensee's mitigation strategies consider:** *NEI/NUSMG 98-07, §6.3*

YES	NO	N/A		
G	G	G	**a.**	**Augmented staff?**
G	G	G	**b.**	**Implementing manual control?**
G	G	G	**c.**	**Placing backup or standby systems in service?**
G	G	G	**d.**	**Developing special procedures?**
G	G	G	**e.**	**Establishing specific training requirements?**
G	G	G	**f.**	**Monitoring systems to ensure proper operation following a key rollover date?**
G	G	G	**725**	**Did the licensee consider existing procedures and practices to develop mitigation strategies?** *NEI/NUSMG 98-07, §6.3*

Verification for Internal Facility Events *NEI/NUSMG 98-07, §6.4*

YES	NO	N/A		
G	G	G	**726**	**Did the licensee verify the contingency plans?** Verifying contingency plans provides confidence that the strategy selected is capable of achieving the intended purpose, can be accomplished coincident with other strategies, and includes personnel who are able to exercise it. The methods that may be used for this evaluation include management assessments, independent reviews, and peer evaluations. *NEI/NUSMG 98-07, §6.4*

CONTINGENCY PLANS FOR EXTERNAL RISKS *NEI/NUSMG 98-07, §7*

External risks result from circumstances, conditions, or events that are not under the direct control of facility management. The purpose of external risk contingency planning is to provide an awareness of such risks and the means of mitigation. *NEI/NUSMG 98-07, Appendix D*

Risk Identification for External Risks *NEI/NUSMG 98-07, §7.1*

Risk identification considers how Y2K-induced external events could compromise the safety or continued operation of the facility. One technique that may be used is boundary analysis.

Boundary analysis postulates a boundary surrounding the facility. Items, signals, information, or data that cross the boundary are candidates for investigation. Examples include transmission lines, communications, consumables, and services. This technique may result in a detailed examination of facility supply chains for a limited number of critical services and consumables for vulnerability to disruption by a Y2K-induced event. Particular attention should be given to facility services or equipment that are jointly administered, either in concert with the facility or by more than one external supplier.

Examples of documents and contingency activities that may be used to identify external events include plans for disaster recovery, resumption of business, station blackout, grid restoration, emergency preparedness, and storm restoration.

740 Did the licensee include the following events in their contingency planning for external events? *NEI/NUSMG 98-07, §7.1*

YES	NO	N/A		
G	G	G	**a.**	**Transmission/distribution system events?** For example, loss of off-site power, grid instability and voltage fluctuations, and loss of grid control systems.
G	G	G	**b.**	**Loss of ultimate heat sink?** (e.g., river water level control is upset)
G	G	G	**c.**	**Depletion of consumables?** (e.g., bottled gases, diesel fuel, and demineralizer resins)
G	G	G	**d.**	**Loss of essential services?** (e.g., telephones, microwave, domestic water, satellite networks, selected vendors, security, police, and fire fighting capabilities)
G	G	G	**e.**	**Loss of emergency plan equipment and services?** (e.g., pagers, radios, sirens, and meteorology).

Event Analysis for External Events *NEI/NUSMG 98-07, §7.2*

750 The purpose of external event analysis is to understand and evaluate the implications of external events. **For each event, did the licensee consider:** *NEI/NUSMG 98-07, §7.2*

YES	NO	N/A		
G	G	G	**a.**	**The affect of the event on safety or operability, including at-power or safe shutdown conditions?**
G	G	G	**b.**	**The likelihood of the event?**
G	G	G	**c.**	**The potential for an event inducing other events, or changing the probability of those events?**
G	G	G	**d.**	**The timing of the event consequences (i.e., immediate, delayed with a known time-to-occurrence, or delayed with an unknown time-to-occurrence)?**
G	G	G	**e.**	**The priority for resumption of service?**
G	G	G	**f.**	**The long-term effect of the event?**
G	G	G	**751**	**Did the licensee consider the effect that a complex supply chain may have on the mitigation strategy?** A supplier may rely on another supplier or service that is subject to Y2K-induced events. A chain of failures in a complex supply chain may compromise more than is readily apparent by looking at only the final source. *NEI/NUSMG 98-07, §7.2*

Risk Management for External Risks *NEI/NUSMG 98-07, §7.3*

Risk Management uses the information from event analysis to determine the mitigation strategies that will reduce the effect of a Y2K-induced event. It ensures that the risks posed by external Y2K-induced events are identified and are reduced to an acceptable level. Risk management may mitigate the risk or may extend the period of facility service pending resumption of the service or conclusion of the event. This management function requires input from business and technical specialists. The two phases of risk management are risk notification and selection of mitigation strategy.

Risk Notification *NEI/NUSMG 98-07, §7.3.1*

YES	NO	N/A		
G	G	G	**752**	**Did the licensee communicate to the responsible external organizations the risk significance to the facility of a Y2K-induced event?**
G	G	G	**753**	**Did the licensee request from the external organizations a description of their Y2K project plans to address Y2K-induced events?**
G	G	G	**754**	**Did the licensee include this information in their mitigation strategies?**

Mitigation Strategy Selection *NEI/NUSMG 98-07, §7.3.2*

755 More than one mitigation strategy may be appropriate and employed for an event. **Did the licensee consider:** *NEI/NUSMG 98-07, §7.3.2*

YES	NO	N/A		
G	G	G	a.	**Facility alignment?** Preset facility load or capacity to reduce the consequences to the facility of grid instability or voltage fluctuations. High-risk evaluations, such a reduced reactor coolant inventory operations or emergency diesel generator maintenance should be scheduled to avoid Y2K key rollover dates, when possible.
G	G	G	b.	**Minimized dependency?** Stockpiling consumables to support continued facility operation.
G	G	G	c.	**Alternate sources?** Many consumables are available from more than one source.
G	G	G	d.	**Alternate processes?** Some services such as telecommunications may be accomplished using alternate methods. For example, portable radios or satellite phones may be used to compensate for normal telephone service.
G	G	G	e.	**Rapid resumption of services?** Where a proactive mitigation strategy is unobtainable or impractical, the management team may adopt rapid resumption of service as a recovery strategy. An example might be a system that will be interrupted by the Y2K-induced event but is easily restarted with support from the external organization.

Verification for External Risks *NEI/NUSMG 98-07, §7.4*

YES	NO	N/A		
G	G	G	760	**Did the licensee verify the risk management strategy?** This process provides confidence that the strategy selected is capable of achieving the intended purpose, can be accomplished coincident with other strategies, and includes personnel who are able to execute it. Methods that can be used for this evaluation may include management assessments, independent reviews, peer reviews, external organization reviews, walk-throughs, drills, or simulations. *NEI/NUSMG 98-07, §7.4*

INTEGRATED Y2K CONTINGENCY PLAN *NEI/NUSMG 98-07, §8*

The integrated contingency plan is a compilation of individual contingency plans and includes the remediation actions planned for key rollover dates. The document is used to manage the resources and staffing required to support the facility leading up to and during the key rollover dates. Inputs required for development of the integrated plan include organization sponsorship and key contacts; identification or required internal and external organizational support; coordination with internal and external interfaces; identification of conflicts among individual contingency plans; and identification of resources necessary to implement individual contingency plans.

Integrated Y2K Contingency Plan Development *NEI/NUSMG 98-07, §8.1*

YES	NO	N/A		
G	G	G	760	**Is the Y2K project manager responsible for developing the contingency plan?** *NEI/NUSMG 98-07, §8.1*
G	G	G	761	**Are staffing plans and actions in the integrated plan?** *NEI/NUSMG 98-07, §8.1*
G	G	G	762	**Are overall resource requirements documented in the plan?** *NEI/NUSMG 98-07, §8.1*

YES	NO	N/A		
G	G	G	763	**Has (or will) the plan be reviewed and approved by senior management?** *NEI/NUSMG 98-07, §8.1*

Integrated Y2K Contingency Plan Content *NEI/NUSMG 98-07, §8.2*

780 Does the integrated Y2K contingency plan include the following topics: *NEI/NUSMG 98-07, §8.2*

YES	NO	N/A		
G	G	G	a.	**Purpose and scope?** The purpose of the plan is to integrate the licensee's resources for a facility-wide approach to mitigate Y2K-induced events. The scope establishes the boundaries of the plan.
G	G	G	b.	**Integrated contingency plan matrix?** The matrix provides the relationship between the individual contingency plans.
G	G	G	c.	**Responsibilities?** The plan should assign responsibilities for managing the implementation of the integrated plan. These responsibilities may include an integrated Y2K contingency plan coordinator, implementation teams, and advisory teams.
G	G	G	d.	**Resource scheduling?** The plan should coordinate the timing and resources necessary for implementing the elements of the integrated contingency plan. This includes coordination between departments, groups, and outside agencies.
G	G	G	e.	**Event response coordination?** The plan should identify the key decision-making processes for responding to Y2K-induced events as they occur.
G	G	G	f.	**Integrated action plan?** The plan should summarize the actions associated with the restoration of facility systems, components, and equipment affected by Y2K-induced events.
G	G	G	g.	**Integrated Y2K contingency plan training and awareness?** The plan should identify specific Y2K training requirements. General facility awareness training on Y2K critical dates and associated contingencies should also be considered.

This is the initial version of the Year 2000 Readiness Audit Plan, which is proposed for use by NRC staff in audits of 12 plant sites as a follow-up to NRC Generic Letter 98-01, to assess the effectiveness of licensee Year 2000 readiness programs.

NRC Y2K READINESS AUDIT PLAN
Revision 0 (08/13/1998)

Preamble

The objectives of this audit are:

1. To assess the effectiveness of licensee programs for achieving Y2K readiness and in addressing compliance with the terms and conditions of their license and NRC regulations and continued safe operation.
2. To evaluate program implementation activities to assure that licensees are on schedule to achieve Y2K readiness in accordance with GL 98-01 guidelines.
3. To assess the licensee contingency planning for addressing risks associated with events resulting from Y2K problems.

This audit should include review of relevant documentation, and interviews with selected utility personnel. Examples of relevant documentation are: facility specific Y2K program plan, assessment plan, inventory listing/database (including possibly separate inventories of embedded systems), project tracking, reviews and evaluations of regulatory considerations including 10 CFR 50.59 changes, QA procedures related to Y2K program, etc. If possible, include direct observation of testing and validation methodology.

Document Review - Thorough familiarization with the following is required prior to the audit.

- Generic Letter 98-01
- Licensee Response(s) to GL 98-01
- License terms and conditions
- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

  Additionally, the review should include the following:

  a. Technical Specifications
  b. 10CFR50.36, "Technical Specifications," paragraph (c)(3), Surveillance requirements," paragraph (c)(5), "Administrative controls."
  c. 10CFR50.47, "Emergency Plans," paragraph (b)(8)
  d. 10CFR50.59, "Changes, tests and experiments"
  e. 10CFR50 Appendix B Criterion III, "Design Control"
  f. 10CFR50 Appendix B Criterion XVII, "Quality Assurance Records"
  g. 10CFR50 Appendix E, "Emergency Response Data System"
  h. 10CFR50 Appendix A General Design Criterion (GDC) 13, "Instrumentation and Control"
  i. 10CFR50 Appendix A GDC 17, "Electric power systems"
  j. 10CFR50 Appendix A GDC 19, "Control room"
  k. 10CFR50 Appendix A GDC 23, "Protection system failure modes"

l. Standard Review Plan Chapter 7, especially Branch Technical Position 14
m. NRC Inspection Manual Chapter 0330: Guidance for Review of Licensee Draft Documents
n. NRC Inspection Manual Chapter 0620: Inspection Documents and Records
o. NRC Inspection Manual Chapter 0610: Inspection Reports
p. Response to Questionnaire Relating to Draft TI on Y2K Readiness of Computer Systems at Nuclear Power Plants
q. NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"
r. Year 2000 Computing Crisis: An Assessment Guide, GAO/AIMD-10.1.14, September 1997
s. Year 2000 Computing Crisis: Business Continuity and Contingency Planning, Exposure Draft, GAO/AIMD-10.1.19, March 1998
t. Year 2000 Computing Crisis: A Testing Guide, Exposure Draft, GAO/AIMD-10.1.21, June 1998

A. **Pre-Visit Activities**

1. Through the Project Manager in coordination with the resident inspector, let the licensee know of the site audit visit 3 to 4 weeks in advance of the visit.
2. Obtain a copy of the licensee's Y2K Readiness Plan and an organization chart showing the Y2K Project alignment. Obtain the name of the Y2K project manager.
3. Based on the Resident Inspector's response to the Y2K questionnaire, identify the stage of the implementation of the plan. Make a list of documents, per the licensee's plan, which have been completed. (For example, if initial assessment has been completed, the inventory list showing the item, its classification and prioritization, should also have been completed.) Select the documents that would be reviewed during the audit at the site.
4. Review the plan, and form an outline of the areas that you would focus on during the site audit.
5. Inform the licensee of the documents that you plan to review, and the project staff you would like to meet. Convey to the licensee that you would like to have a presentation of the plant's Y2K program on the first day of the visit as part of the entrance meeting.

B. **Site Visit Activities**

DAY 1

1. At the entrance meeting, convey to the licensee that the intent of the visit is to see how well the plant-specific Y2K readiness program is being implemented and whether it will meet its main objective of making the plant Y2K ready on schedule. The audit will focus on those areas affecting safety (safety-related computer systems) first. Subsequently, the remainder of the Y2K readiness program will be assessed for those areas important to plant operation but not directly affecting safety. Systems to consider include the security computer, emergency response (data collection and

communication) systems, radiation monitoring systems, surveillance tracking systems, and process controls (feedwater, turbine, power).

2. Use information obtained from licensee's presentation, along with your understanding of the plant-specific plan, as a means of gaining a good understanding of the licensee's program. Conduct discussions with the licensee's program staff on specific aspects requiring additional detail. The idea is to get a good understanding of the licensee Y2K program and its implementation. Discuss management, QA, resources, and schedules. *Remember, it is based on this that you would flesh out the detailed audit that you had outlined during your pre-visit activities.*

   (These activities, plus access to site, would probably take all of the first day.)

DAY 2, 3 & 4

The licensee's facility specific Y2K program was developed based on the guidance in NEI/NUSMG 97-07. NEI/NUSMG 97-07 suggests a five phase approach to ensure that a licensees plant continues to operate safely and within the requirements of their license and NRC regulations. The status of the implementation of these phases and schedules for remaining activities, including planning and coordination of Y2K-related work during currently planned outages, should be examined against the July 1, 1999 Y2K readiness date in GL 98-01. The allocation of funds and resources for completion of the phases should also be reviewed.

The scope of systems described in the licensee's Y2K program should include an inventory and assessment of software-based systems and equipment necessary for plant safety and operation, and to satisfy license conditions, technical specifications, and NRC regulations. It should be confirmed that the inventory and assessment has included a review of embedded software systems. Inventory/assessment should also include testing and calibration equipment, spares and interfaces. The program plan should provide appropriate emphasis and priority on safety-related systems/components and systems required for safe operation at the initial and detailed assessment stages.

Methods for assessing Y2K susceptibility should be examined. Verify that appropriate bases (e.g. testing, knowledge-based decisions, testing of the same system by others, use of a tool to evaluate code, vendor certified information, code inspections, and engineering analysis) are provided for Y2K readiness and Y2K compliance as identified by the facility specific program objectives. *{NOTE: Where the licensee relies on data and information provided by others for the bases, including vendors, care should be taken to check that the licensee's program has steps as appropriate for assessing and validating the information.}* Further, when compensatory measures or "work arounds" are identified for achieving Y2K readiness, they should be evaluated for their appropriateness. *{NOTE; When compensatory measures are used, they should be addressed in related contingency plans. They should also be identified, as part of the program, in longer-term maintenance or corrective actions to maintain the system, device, or application Y2K ready.}*

Testing and validation is performed as part of the implementation process. There are several critical dates that should be considered in the determination of Y2K readiness or compliance as follows:

September 9,1999	09/09/99
December 31, 1999	12/31/99
January 1, 2000	01/01/00
February 28, 2000	02/28/00
February 29, 2000	02/29/00
March 1, 2000	03/01/00

In addition to the information provided in NEI/NUSMG 97-07, contingency planning should be addressed in detail. Contingency actions to be taken in the event that unanticipated occurrences or malfunctions occur should be reviewed against the potential concerns identified in the Y2K program. In addition, it should be confirmed that certain, high-priority contingency plans, identified by the facility-specific contingency planning, have been established, for example for ensuring adequate emergency diesel fuel oil to cope with a possible extended loss of offsite power, augmentation of staffing, alternative means of emergency communication and post-accident data collection are available, alternative means of controlling access to vital areas is provided, and provisions to minimize the probability of losing electric power from the grid are available in the event of a nuclear power plant shutdown. It can be anticipated that many licensees will not have completed contingency planning at this stage of their program. However, contingency planning should clearly be incorporated in the facility-specific Y2K program plan. Licensee programs may reference NEI/NUSMG 98-07 or GAO/AIMD-10.1.19 as a basis for contingency planning.

The licensee's review of their regulatory compliance should include a determination of the need for changes to the licensing basis, technical specifications, licensing commitments, and plant safety analysis report.

C. **Conclusion of Site Activities**

Plan to have an exit meeting with the Y2K project manager. Discuss, in general terms, the review you had done of the facility specific Y2K program, and in particular, any open items that were identified to conclude your audit. Mutually agree upon an avenue to resolve these open items so that you can close out the audit.

September 13, 1999

MEMORANDUM TO:	William D. Travers Executive Director for Operations
FROM:	Samuel J. Collins, Director Office of Nuclear Reactor Regulation
SUBJECT:	FOLLOWUP ON SECY-99-162:POLICY FOR REGULATORY ACTIONS FOR LICENSEES OF NUCLEAR POWER PLANTS THAT HAVE NOT COMPLETED YEAR 2000 READINESS ACTIVITIES

The SRM related to SECY-99-162, dated August 5, 1999, approved the policy for staff action for nuclear power plants that have not completed Y2K readiness activities by July 1, 1999, subject to comments. Based on discussions with your staff, NRR has revised the proposed policy as attached.

Item 1 of the SRM recommended that clarifications be made to the policy to ensure that regulatory actions, where appropriate, would be taken sufficiently in advance of the Y2K rollover date such that all plants will be in a stable, safe condition during the transition. In addition, the SRM recommended that the policy be updated to reflect receipt and analysis of licensee responses to Generic Letter 98-01 and its Supplement. The attached policy satisfies Item 1 of the SRM.

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," provides a status of nuclear power plant Year 2000 readiness as of September 1, 1999, and a description of past and future NRC actions to verify Y2K readiness in operating U.S. reactors. The NUREG combines the results of the staff reviews with the July 1, 1999, licensee responses to Generic Letter 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." Based on information contained in the NUREG, the staff has concluded that safety systems at all 103 nuclear power plants are Y2K ready. The remaining Y2K system deficiencies are in either non-safety systems involving power generation or administrative/support systems not involving power generation. As of September 1, the staff concludes that licensees of 75 plants are fully Y2K ready. In addition, the staff projects that 83 of the 103 plants will have completed all Y2K program activities by September 30, 1999.

In SECY-99-162, the staff stated that plants that have not completed Y2K program activities by September 30 would receive additional scrutiny on a case-by-case basis to ensure that no Y2K deficiencies remain after November 30, 1999. With one exception (Farley Unit 2), all plants have scheduled their Y2K modifications by November 30, 1999. Farley Unit 2 has scheduled modifications to their turbine digital EHC system during their fall refueling outage and has committed to make these modifications prior to December 16, 1999. Considering that the Farley licensee has successfully performed similar modifications on Unit 1, the staff has a high level of confidence that this work will be completed on schedule.

Consistent with the SRM and as a followup to the licensee's GL 98-01 response, the staff is planning additional actions for the 20 plants that are not scheduled to complete their Y2K program activities prior to September 30. Action will be taken in a graded approach depending on the nature of the deficiencies and will be in the form of letters (samples attached to the revised policy) confirming the staff's understanding of (1) those systems having Y2K deficiencies and (2) the licensee's projected completion date. All letters are scheduled to be issued by September 30, 1999. In addition, the staff will monitor each licensee's progress to ensure that schedules do not slip. The need for additional action, beyond the letters

described above, will be determined on a case-by-case basis.

As described in NUREG-1706, the staff does not believe that significant plant-specific action directed by NRC will be needed. However, in the unlikely event of a significant schedule delay for a system affecting plant operation, or we receive a report of a Y2K issue involving a system affecting safety or plant operation, the staff is prepared to take appropriate regulatory action. NRR and OGC have drafted a sample Order, should such regulatory action be necessary where there may be a lack of reasonable assurance of adequate protection of the public health and safety or the common defense and security.

Item 2 of the SRM, which requested updates of the staff's Y2K website to further increase the public's confidence in Y2K readiness activities, is ongoing. Item 3 of the SRM requested that the monthly reports to the Commission include a summary status of each plant along with the licensee's and staff's intended action for each facility that will not be Y2K ready by September 30. This request was addressed in the August 1999 monthly report and will continue to be updated with each additional monthly report.

Attachment:
Revised Policy

CONTACT:
Richard H. Wessman, NRR
415-3298

Policy for Regulatory Action for Licensees of Nuclear Power Plants that Did Not Complete Year 2000 Readiness Activities by July 1, 1999

1. Introduction

The staff requirements memorandum (SRM) related to SECY-99-162, dated August 5, 1999, approved the proposed policy for staff action for nuclear power plants that have not completed Y2K readiness activities by July 1, 1999, subject to comments. The revised policy in this paper is responsive to the Commission's SRM and will be followed by the NRC staff to determine appropriate regulatory action for licensees of nuclear power plants that did not complete Year 2000 (Y2K) readiness activities, including formulation and implementation of contingency plans, by July 1, 1999. This policy supplements the agency's Contingency Plan for the Year 2000 Issue in the Nuclear Industry and the Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition, described in SECYs 99-134 and 99-135, respectively.

This policy has been promulgated to ensure that all nuclear power plants will be in a stable, safe condition during the Y2K transition and that any required regulatory action will be taken well in advance of the transition. At this time, the staff believes that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and does not believe that significant plant-specific action directed by the NRC is likely to be needed.

A copy of this policy will be placed on the Commission's Y2K website.

2. Background

Since 1996, the NRC has been working with nuclear power plant licensees to ensure that plant systems are "Y2K-ready" before the year 2000. In Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," the NRC requested all holders of operating licenses for nuclear power plants to: (1) inform the NRC of steps they are taking to ensure that computer systems will function properly by the year 2000; and (2) by July 1, 1999, provide a status report with a completion schedule for any remaining effort required for Y2K readiness. All licensees responded to part (1) of the generic letter, stating that they have adopted an NRC-accepted industry program that examines both safety-related and non-safety-related systems and components, and that the program is being implemented to ensure that plants are Y2K-ready by January 1, 2000.

Supplement 1 to GL 98-01 was issued by the NRC in January 1999, and provided an alternative to part (2) of the generic letter. The alternative request for information, which was voluntary, expanded the scope of the reporting requirements to include systems that are necessary for continued plant operation but that are beyond the terms and conditions of the plant's license and NRC regulations. All utilities chose this option and reported on plant Y2K readiness for systems within their license and NRC regulations plus all systems required for continued plant operation.

3. Regulatory Basis (as previously provided to the Commission in SECY 99-162)

Pursuant to the Atomic Energy Act of 1954, as amended (AEA), and the Energy Reorganization Act of 1974, the NRC has broad authority to regulate nuclear power facilities as it deems necessary or appropriate in order to protect the public health and safety and the common defense and security. Sections 161b and 161i(3) of the AEA authorize the Commission to issue orders as may be "necessary or desirable to promote the common defense and security or to protect health or minimize danger to life or property" and to issue orders "to govern any activity authorized pursuant to this Act ... in order to protect health and minimize danger to life or property." Section 182 of the AEA requires the Commission to ensure that nuclear facilities operate "in accord with the common defense and security and ... provide adequate protection to the health and safety of the public."

Although the possibility is remote, there may be unanticipated Y2K issues at several generating facilities (both non-nuclear and nuclear) whose cumulative effect could adversely affect the overall grid. Hence, if a Y2K deficiency at a nuclear power reactor were to cause the reactor to trip or experience a transient during the Y2K transition, there could be a detrimental effect on the grid. This, in turn, could adversely affect the public health and safety and/or the common defense and security of the United States. To address this concern, the Commission may elect, for a plant with identified Y2K deficiencies, to conduct management meetings with a licensee and/or schedule reactive inspections to evaluate the significance of the Y2K deficiencies. Licensees may take voluntary actions to restrict or modify plant operations as a result of Y2K deficiencies, similar to voluntary actions taken by licensees in anticipation of severe weather such as hurricanes[(1)]. Where there may be a lack of reasonable assurance of adequate protection of the public health and safety or the common defense and security, the Commission may order a licensee to take remedial actions, restrict plant operations, and/or shut down the plant in anticipation of the Y2K transition.

4. Regulatory Policy

Regulatory action, where appropriate, will be taken sufficiently in advance of the Y2K rollover date (i.e., as soon as September 30, but no later than December 1, 1999) to ensure that nuclear power plants will be in a stable, safe condition during the Y2K transition. If, by September 30, it appears that Y2K readiness activities will not be completed in advance of the December 31, 1999 transition, the NRC will take appropriate regulatory action, including issuance of Confirmatory Action Letters or Orders, if warranted. These regulatory actions will be consistent with the NRC's Contingency Plan for the Year 2000 Issue in the Nuclear Industry and the Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition.

If the staff concludes that the likelihood of completing remedial actions prior to the Y2K transition is questionable and the consequences of unremediated deficiencies are substantial, regulatory action may be taken as determined by the Director of the Office of Nuclear Reactor Regulation (or designee) with concurrence from the appropriate regional administrator (or designee). As stated in the Regulatory Basis of this paper, regulatory action may be taken where there may be a lack of reasonable assurance of adequate protection of the public health and safety or the common defense and security. Although considered unlikely, the licensee may be ordered to take specific actions, up to and including a plant shutdown, even though all the Commission's rules and regulations may be met.

The Commission will be consulted prior to the issuance of any Order regarding Y2K matters.

Subsequent to any Y2K-related shutdown, plant startup decisions, including lifting of an Order, will be based on an NRC staff review of the licensee's assessment that all Y2K-related operational issues necessitating a plant shutdown have been satisfactorily addressed. Any regulatory action (e.g., issuance of Orders and their subsequent lifting) will be posted on the NRC Y2K website.

Licensee Responses to the Generic Letter

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," provides a status of nuclear power plant Year 2000 readiness as of September 1, 1999, and a description of past and future NRC actions to verify Y2K readiness in operating U.S. reactors. The NUREG combines the results of the staff reviews with the July 1, 1999, licensee responses to Generic Letter 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." Based on information contained in the NUREG, the staff has concluded that safety systems at all 103 nuclear power plants are Y2K ready. The remaining Y2K system deficiencies are in either non-safety systems involving power generation or administrative/support systems not involving power generation. As of September 1, 1999, the staff concludes that licensees of 75 plants are fully Y2K ready. In addition, the staff projects that 83 of the 103 plants are currently scheduled to be fully Y2K ready by September 30, 1999. The results of this review, updated to account for licensees which completed Y2K remediation efforts in July and August, are provided in the attached Summary Table (Attachment 1).

4.1 Plants that Completed Y2K Program Activities by July 1, 1999

As of July 1, 1999, licensees of 68 reactors reported that all Y2K readiness activities were completed, including remediation and contingency planning. With the exception of Cooper (which has integrated

contingency plan and several minor non-safety equipment issues), these plants will not undergo additional Y2K-related inspections. Cooper reported completion of their Y2K program activities on September 2, 1999, and will receive a supplemental TI 2515/141 followup inspection.

4.2 Plants Scheduled to Complete Y2K Program Activities by September 30, 1999

As previously stated, staff review of licensee responses to the generic letter conclude that 75 plants were fully Y2K ready as of September 1 and that a total of 83 plants are projected to be fully Y2K ready by September 30. Plants scheduled to complete Y2K program activities by September 30 include the following:

Beaver Valley 1 & 2	Clinton	Cooper
Limerick 2	Oyster Creek	Peach Bottom 2
Vermont Yankee		

Plants with a projected completion date by September 30, 1999, will be monitored by regional staff to ensure that the schedules are maintained. Staff confirmation of the completion of plant-specific items identified by licensees in the generic letter responses will be documented in routine NRC inspection reports. No additional Y2K-oversight is planned unless site-specific issues arise that indicate further scrutiny would be advisable or changes in completion dates delay plant Y2K readiness beyond September 30, 1999.

4.3 All Other Plants

Consistent with the SRM and as a followup to the licensee's GL 98-01 response, the staff is proposing additional actions for the 20 plants that are not scheduled to complete their Y2K program activities prior to September 30. Action will be taken in a graded approach depending on the nature of the deficiencies and will be in the form of letters confirming the staff's understanding of (1) those systems having Y2K deficiencies and (2) the licensee's projected completion date. All letters are scheduled to be issued by September 30, 1999. In addition, staff will monitor each licensee's progress to ensure that schedules do not slip.

Through agreement with NEI, all licensees are expected to provide a written response documenting final completion of their Y2K program activities. The staff is planing to verify completion of these activities through routine inspection reports. At this time, the staff does not believe that regulatory action, in the form of Orders or Confirmatory Action Letters, will be necessary.

Each of these 20 plants has been examined to identify the systems and components that are not Y2K-ready. While all plants have reported that systems needed for reactor safety and reactor protection are Y2K-ready, each of these plants has Y2K deficiencies in one or both of categories "B" and "C", below. A detailed breakdown of individual plant status is provided in NUREG-1706.

(A) <u>Systems affecting safety</u>

This category includes plants with systems and components that are not Y2K-ready and whose direct, on-line functioning is required for nuclear safety or reactor protection, including safe reactor shutdown and mitigation of design basis events (for example, systems covered by license conditions, including

technical specifications). Plants without completed contingency plans for these systems and components are also included in this category.

Based on licensee submittals and NRC audits and inspections, the NRC staff has determined that there are no plants in this category. Systems required for safe operation and shutdown are Y2K-ready at all 103 operating reactors.

(B) Systems affecting plant operations

This category includes plants with systems and components that are not Y2K-ready and have the potential to cause a transient during the Y2K transition. Plants without completed contingency plans for these systems and components are also included in this category.

The following 9 plants are included in this category and will be sent a letter (Attachment 2).

Comanche Peak 1	Diablo Canyon 1 & 2	Farley 2
Peach Bottom 3	Salem 1	South Texas 1 & 2
Three Mile Island 1		

In consideration of the importance that the NRC places on making these Y2K remediation efforts sufficiently in advance of the Y2K transition date, licensees will be requested to inform the staff of (1) changes in the Y2K system deficiencies as stated, or (2) any changes in the projected completion schedule. This is to efficiently schedule regional inspections to verify completion of the Y2K work. Licensees will be requested to submit a letter documenting when the work is complete.

With one exception, all of the above plants are scheduled to complete Y2K remediation efforts by November 30, 1999. The one exception, Farley Unit 2, has scheduled a completion date of December 16, 1999, as part of their fall refueling outage. Considering that the same modification was successfully completed at Farley Unit 1, the staff has confidence that the licensee will complete the work within the projected schedule.

(C) Systems not affecting safety or plant operations (support systems)

This category includes plants (not included in the above categories) with other systems and components that are not Y2K-ready and/or have incomplete contingency plans for these systems and components. These systems and components, which are considered administrative or support in nature, would not have the potential to cause a transient during the Y2K transition.

The following 11 plants are included in this category and will be sent a letter (Attachment 3).

Browns Ferry 2 & 3	Comanche Peak 2	Cook 1 & 2
Hope Creek	North Anna 2	Salem 2
Sequoyah 1 & 2	Watts Bar 1	

Licensees of the above plants will not be asked to respond to our letters provided that they agree with both the characterization of the systems and/or components that are not Y2K ready and the projected completion schedule. Routine inspection monitoring will follow licensee onsite activities and will verify completion of these Y2K activities.

Attachments:

1. Summary Table
2. Sample Letter - Category B
3. Sample Letter - Category C

Summary Table		
Nuclear Power Plant (NPP) Y2K Readiness Status as of September 1, 1999		
NPP Name	**Completion Status/Date**	**Systems Impacted***
Arkansas 1 and 2	Y2K Ready	--
Beaver Valley 1 and 2	9/30/99	Operations
Braidwood 1 and 2	Y2K Ready	--
Browns Ferry 2 and 3	10/31/99	Admin.
Brunswick 1	Y2K Ready	--
Brunswick 2	Y2K Ready	--
Byron 1 and 2	Y2K Ready	--
Callaway	Y2K Ready	--
Calvert Cliffs 1 and 2	Y2K Ready	--
Catawba 1 and 2	Y2K Ready	--
Clinton	9/22/99	Operations
Comanche Peak 1	11/30/99	Operations
Comanche Peak 2	10/30/99	Admin.
Cooper	9/20/99	Operations
Crystal River 3	Y2K Ready	--
Davis-Besse	Y2K Ready	--
D.C. Cook 1 and 2	10/30/99	Admin.
Diablo Canyon 1 and 2	10/31/99	Operations
Dresden 2 and 3	Y2K Ready	--
Duane Arnold	Y2K Ready	--
Farley 1	Y2K Ready	--
Farley 2	12/16/99	Operations
Fermi 2	Y2K Ready	--
Fitzpatrick	Y2K Ready	--
Fort Calhoun	Y2K Ready	--
Ginna	Y2K Ready	--
Grand Gulf	Y2K Ready	--
Harris	Y2K Ready	--
Hatch 1 and 2	Y2K Ready	--
Hope Creek	10/29/99	Admin.
Indian Point 2	Y2K Ready	--
Indian Point 3	Y2K Ready	--

Kewaunee	Y2K Ready	--
LaSalle 1 and 2	Y2K Ready	--
Limerick 1	Y2K Ready	--
Limerick 2	9/30/99	Operations
McGuire 1 and 2	Y2K Ready	--
Millstone 2 and 3	Y2K Ready	--
Monticello	Y2K Ready	--
Nine Mile Point 1 and 2	Y2K Ready	--
North Anna 1	Y2K Ready	--
North Anna 2	10/29/99	Admin.
Oconee 1, 2 and 3	Y2K Ready	--
Oyster Creek	9/30/99	Admin.
Palisades	Y2K Ready	--
Palo Verde 1, 2 and 3	Y2K Ready	--
Peach Bottom 2	9/30/99	Operations
Peach Bottom 3	10/31/99	Operations
Perry	Y2K Ready	--
Pilgrim	Y2K Ready	--
Point Beach 1 and 2	Y2K Ready	--
Prairie Island 1 and 2	Y2K Ready	--
Quad Cities 1 and 2	Y2K Ready	--
River Bend	Y2K Ready	--
Robinson 2	Y2K Ready	--
Salem 1	11/6/99	Operations
Salem 2	10/29/99	Admin.
San Onofre 2 and 3	Y2K Ready	--
Seabrook	Y2K Ready	--
Sequoyah 1 and 2	10/31/99	Admin.
South Texas 1 and 2	10/31/99	Operations
St. Lucie 1 and 2	Y2K Ready	--
Summer	Y2K Ready	--
Surry 1 and 2	Y2K Ready	--
Susquehanna 1 and 2	Y2K Ready	--
Three Mile Island 1	10/21/99	Operations
Turkey Point 3 and 4	Y2K Ready	--
Vermont Yankee	9/30/99	Admin.
Vogtle 1 and 2	Y2K Ready	--
Washington Nuclear 2	Y2K Ready	--

Waterford 3	Y2K Ready	--
Watts Bar	10/31/99	Admin.
Wolf Creek	Y2K Ready	--
*Staff review has concluded that safety-related systems for all plants are Y2K ready. Systems needed for continued plant operations are denoted "Operations"		

Sample Letter - Category B

[LICENSEE'S NAME AND ADDRESS]

SUBJECT: **[PLANT NAME(S)]** -- RESPONSE TO GENERIC LETTER 98-01, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS" (**TAC NO.(S)**)

Dear **[LICENSEE'S NAME]:**

In Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants" and its Supplement 1, we requested utilities to submit plans and schedules for resolving Y2K-related issues. We have received and reviewed all licensees' corrective plans and schedules. Based on our review of licensee responses and our onsite assessment of licensee Y2K activities as described in NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," we have concluded that there are no nuclear plants with Y2K issues involving safety systems.

Increased public awareness and attention to the Y2K issue has resulted in concern over the ability of nuclear power plants to provide uninterrupted power to the national electric power grid during the Y2K transition. In this regard, we are focusing attention beyond those systems necessary to maintain safety. Consequently, we are closely monitoring those plants having Y2K deficiencies in systems that could impact plant operation that are not scheduled for remediation prior to September 30, 1999. As you are aware, a Y2K deficiency in certain systems or components might cause a transient during the Y2K transition that could affect the national electric power grid.

In your letter of **[USE APPLICABLE DATE]**, for **[LIST APPLICABLE PLANT NAMES]** you stated the following:

- The **[LIST APPLICABLE PLANT NAMES]** will not be Y2K ready until you make changes to the **[LIST SPECIFIC SYSTEMS NEEDING Y2K REMEDIATION]**
- You intend to make these system changes by **[LIST DATE].**

It is our understanding that at least one of the systems or components listed above, which are currently not Y2K ready, may have the potential to cause a transient during the Y2K transition or be important to continued power operation at your facility. The NRC considers it important to complete these Y2K remediation efforts in advance of the Y2K transition date. To efficiently schedule regional inspections to verify completion of the Y2K work, you are requested to inform the staff of any changes in (1) the scope of the Y2K system deficiencies listed above, or (2) your projected completion schedule. Please submit a letter documenting when work is complete.

We would like to acknowledge the efforts you have completed to date in preparing your plant for the Y2K transition and appreciate your continued cooperation on this important issue.

The collection of this information is covered by OMB Clearance 3150-0012 which expires on June 30, 2000. We estimate that the effort to collect this information and report back to us by letter will take approximately 8 hours.

Please contact me at **[PROJECT MANAGER'S TELEPHONE NO.]** if you have any questions.

Sincerely,

[PROJECT MANAGER SIGNATURE BLOCK]

Docket No**[s]**

cc: See next page

Sample Letter - Category C

[LICENSEE'S NAME AND ADDRESS]

SUBJECT: **[PLANT NAME(S)]** -- RESPONSE TO GENERIC LETTER 98-01, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS" (**TAC NO.(S)**)

Dear **[LICENSEE'S NAME]:**

In Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants" and its Supplement 1, we requested utilities to submit plans and schedules for resolving Y2K-related issues. We have received and reviewed all licensees' corrective plans and schedules. Based on our review of licensee responses and our onsite assessment of licensee Y2K activities as described in NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," we have concluded that there are no nuclear plants with Y2K issues involving safety systems.

Increased public awareness and attention to the Y2K issue has resulted in concern over the ability of nuclear power plants to provide uninterrupted power to the national electric power grid during the Y2K transition. In this regard, we are focusing attention beyond those systems necessary to maintain safety. Consequently, we are closely monitoring those plants having Y2K deficiencies in systems that could impact plant operation that are not scheduled for remediation prior to September 30, 1999. As you are aware, a Y2K deficiency in certain systems or components might cause a transient during the Y2K transition that could affect the national electric power grid.

In your letter of **[USE APPLICABLE DATE]**, for **[LIST APPLICABLE PLANT NAMES]** you stated the following:

- The **[LIST APPLICABLE PLANT NAMES]** will not be Y2K ready until you make changes to the **[LIST SPECIFIC SYSTEMS NEEDING Y2K REMEDIATION]**
- You intend to make these system changes by **[LIST DATE].**

It is our understanding that the systems and/or components listed above, which are currently not Y2K ready, can be categorized as administrative or support in nature and would not have the potential to cause

a transient during the Y2K transition. Regional inspection activities are being planned to verify completion of these activities. If you agree with both the above characterization of the systems and/or components that are not Y2K ready and the projected completion schedule, you do not need to respond to this letter. However, you are requested to inform the NRC when the work is complete.

We would like to acknowledge the efforts you have completed to date in preparing your plant for the Y2K transition and appreciate your continued cooperation on this important issue.

The collection of this information is covered by OMB Clearance 3150-0012 which expires on June 30, 2000. We estimate that the effort to collect this information and report back to us by letter will take approximately 8 hours.

Please contact me at **[PROJECT MANAGER'S TELEPHONE NO.]** if you have any questions.

Sincerely,

[PROJECT MANAGER SIGNATURE BLOCK]

Docket No**[s]**

1. For example, plants subject to hurricanes, such as Turkey Point on the Florida coast and Brunswick on the North Carolina coast, have procedures that require the units to be shut down in anticipation of hurricane-force winds, even though all regulatory requirements may be met.

September 13, 1999

MEMORANDUM TO: William D. Travers
Executive Director for Operations

FROM: Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

SUBJECT: FOLLOWUP ON SECY-99-162: POLICY FOR REGULATORY ACTIONS FOR LICENSEES OF NUCLEAR POWER PLANTS THAT HAVE NOT COMPLETED YEAR 2000 READINESS ACTIVITIES

The SRM related to SECY-99-162, dated August 5, 1999, approved the policy for staff action for nuclear power plants that have not completed Y2K readiness activities by July 1, 1999, subject to comments. Based on discussions with your staff, NRR has revised the proposed policy as attached.

Item 1 of the SRM recommended that clarifications be made to the policy to ensure that regulatory actions, where appropriate, would be taken sufficiently in advance of the Y2K rollover date such that all plants will be in a stable, safe condition during the transition. In addition, the SRM recommended that the policy be updated to reflect receipt and analysis of licensee responses to Generic Letter 98-01 and its Supplement. The attached policy satisfies Item 1 of the SRM.

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," provides a status of nuclear power plant Year 2000 readiness as of September 1, 1999, and a description of past and future NRC actions to verify Y2K readiness in operating U.S. reactors. The NUREG combines the results of the staff reviews with the July 1, 1999, licensee responses to Generic Letter 98-01, Supplement 1, “Year 2000 Readiness of Computer Systems at Nuclear Power Plants.” Based on information contained in the NUREG, the staff has concluded that safety systems at all 103 nuclear power plants are Y2K ready. The remaining Y2K system deficiencies are in either non-safety systems involving power generation or administrative/support systems not involving power generation. As of September 1, the staff concludes that licensees of 75 plants are fully Y2K ready. In addition, the staff projects that 83 of the 103 plants will have completed all Y2K program activities by September 30, 1999.

In SECY-99-162, the staff stated that plants that have not completed Y2K program activities by September 30 would receive additional scrutiny on a case-by-case basis to ensure that no Y2K deficiencies remain after November 30, 1999. With one exception (Farley Unit 2), all plants have scheduled their Y2K modifications by November 30, 1999. Farley Unit 2 has scheduled modifications to their turbine digital EHC system during their fall refueling outage and has committed to make these modifications prior to December 16, 1999. Considering that the Farley licensee has successfully performed similar modifications on Unit 1, the staff has a high level of confidence that this work will be completed on schedule.

Consistent with the SRM and as a followup to the licensee’s GL 98-01 response, the staff is planning additional actions for the 20 plants that are not scheduled to complete their Y2K program activities prior to September 30. Action will be taken in a graded approach depending on the nature of the deficiencies and will be in the form of letters (samples attached to the

revised policy) confirming the staff's understanding of (1) those systems having Y2K deficiencies and (2) the licensee's projected completion date. All letters are scheduled to be issued by September 30, 1999. In addition, the staff will monitor each licensee's progress to ensure that schedules do not slip. The need for additional action, beyond the letters described above, will be determined on a case-by-case basis.

As described in NUREG-1706, the staff does not believe that significant plant-specific action directed by NRC will be needed. However, in the unlikely event of a significant schedule delay for a system affecting plant operation, or we receive a report of a Y2K issue involving a system affecting safety or plant operation, the staff is prepared to take appropriate regulatory action. NRR and OGC have drafted a sample Order, should such regulatory action be necessary where there may be a lack of reasonable assurance of adequate protection of the public health and safety or the common defense and security.

Item 2 of the SRM, which requested updates of the staff's Y2K website to further increase the public's confidence in Y2K readiness activities, is ongoing. Item 3 of the SRM requested that the monthly reports to the Commission include a summary status of each plant along with the licensee's and staff's intended action for each facility that will not be Y2K ready by September 30. This request was addressed in the August 1999 monthly report and will continue to be updated with each additional monthly report.

Attachment:
Revised Policy

CONTACT:
Richard H. Wessman, NRR
415-3298

POLICY FOR REGULATORY ACTION FOR LICENSEES OF NUCLEAR POWER PLANTS THAT DID NOT COMPLETE YEAR 2000 READINESS ACTIVITIES BY JULY 1, 1999

1. INTRODUCTION

The staff requirements memorandum (SRM) related to SECY-99-162, dated August 5, 1999, approved the proposed policy for staff action for nuclear power plants that have not completed Y2K readiness activities by July 1, 1999, subject to comments. The revised policy in this paper is responsive to the Commission's SRM and will be followed by the NRC staff to determine appropriate regulatory action for licensees of nuclear power plants that did not complete Year 2000 (Y2K) readiness activities, including formulation and implementation of contingency plans, by July 1, 1999. This policy supplements the agency's Contingency Plan for the Year 2000 Issue in the Nuclear Industry and the Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition, described in SECYs 99-134 and 99-135, respectively.

This policy has been promulgated to ensure that all nuclear power plants will be in a stable, safe condition during the Y2K transition and that any required regulatory action will be taken well in advance of the transition. At this time, the staff believes that all licensees will be able to operate their plants safely during the transition from 1999 to 2000 and does not believe that significant plant-specific action directed by the NRC is likely to be needed.

A copy of this policy will be placed on the Commission's Y2K website.

2. BACKGROUND

Since 1996, the NRC has been working with nuclear power plant licensees to ensure that plant systems are "Y2K-ready" before the year 2000. In Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," the NRC requested all holders of operating licenses for nuclear power plants to: (1) inform the NRC of steps they are taking to ensure that computer systems will function properly by the year 2000; and (2) by July 1, 1999, provide a status report with a completion schedule for any remaining effort required for Y2K readiness. All licensees responded to part (1) of the generic letter, stating that they have adopted an NRC-accepted industry program that examines both safety-related and non-safety-related systems and components, and that the program is being implemented to ensure that plants are Y2K-ready by January 1, 2000.

Supplement 1 to GL 98-01 was issued by the NRC in January 1999, and provided an alternative to part (2) of the generic letter. The alternative request for information, which was voluntary, expanded the scope of the reporting requirements to include systems that are necessary for continued plant operation but that are beyond the terms and conditions of the plant's license and NRC regulations. All utilities chose this option and reported on plant Y2K readiness for systems within their license and NRC regulations plus all systems required for continued plant operation.

3. REGULATORY BASIS (As previously provided to the Commission in SECY 99-162)

Pursuant to the Atomic Energy Act of 1954, as amended (AEA), and the Energy Reorganization Act of 1974, the NRC has broad authority to regulate nuclear power facilities as it deems necessary or appropriate in order to protect the public health and safety and the common defense and security. Sections 161b and 161i(3) of the AEA authorize the Commission to issue orders as may be "necessary or desirable to promote the common defense and security or to protect health or minimize danger to life or property" and to issue orders "to govern any activity authorized pursuant to this Act ... in order to protect health and minimize danger to life or property." Section 182 of the AEA requires the Commission to ensure that nuclear facilities operate "in accord with the common defense and security and ... provide adequate protection to the health and safety of the public."

Although the possibility is remote, there may be unanticipated Y2K issues at several generating facilities (both non-nuclear and nuclear) whose cumulative effect could adversely affect the overall grid. Hence, if a Y2K deficiency at a nuclear power reactor were to cause the reactor to trip or experience a transient during the Y2K transition, there could be a detrimental effect on the grid. This, in turn, could adversely affect the public health and safety and/or the common defense and security of the United States. To address this concern, the Commission may elect, for a plant with identified Y2K deficiencies, to conduct management meetings with a licensee and/or schedule reactive inspections to evaluate the significance of the Y2K deficiencies. Licensees may take voluntary actions to restrict or modify plant operations as a result of Y2K deficiencies, similar to voluntary actions taken by licensees in anticipation of severe weather such as hurricanes[1]. Where there may be a lack of reasonable assurance of adequate protection of the public health and safety or the common defense and security, the Commission may order a licensee to take remedial actions, restrict plant operations, and/or shut down the plant in anticipation of the Y2K transition.

4. REGULATORY POLICY

Regulatory action, where appropriate, will be taken sufficiently in advance of the Y2K rollover date (i.e., as soon as September 30, but no later than December 1, 1999) to ensure that nuclear power plants will be in a stable, safe condition during the Y2K transition. If, by September 30, it appears that Y2K readiness activities will not be completed in advance of the December 31, 1999 transition, the NRC will take appropriate regulatory action, including issuance of Confirmatory Action Letters or Orders, if warranted. These regulatory actions will be consistent with the NRC's Contingency Plan for the Year 2000 Issue in the Nuclear Industry and the Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition.

If the staff concludes that the likelihood of completing remedial actions prior to the Y2K transition is questionable and the consequences of unremediated deficiencies are substantial, regulatory action may be taken as determined by the Director of the Office of Nuclear Reactor Regulation (or designee) with concurrence from the appropriate regional administrator (or designee). As stated in the Regulatory Basis of this paper, regulatory action may be taken where there may be a lack of reasonable assurance of adequate protection of the public health and safety or the common defense and security. Although considered unlikely, the licensee may be ordered to take specific actions, up to and including a plant shutdown, even though all the Commission's rules and regulations may be met.

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[1]For example, plants subject to hurricanes, such as Turkey Point on the Florida coast and Brunswick on the North Carolina coast, have procedures that require the units to be shut down in anticipation of hurricane-force winds, even though all regulatory requirements may be met.

The Commission will be consulted prior to the issuance of any Order regarding Y2K matters. Subsequent to any Y2K-related shutdown, plant startup decisions, including lifting of an Order, will be based on an NRC staff review of the licensee's assessment that all Y2K-related operational issues necessitating a plant shutdown have been satisfactorily addressed. Any regulatory action (e.g., issuance of Orders and their subsequent lifting) will be posted on the NRC Y2K website.

LICENSEE RESPONSES TO THE GENERIC LETTER

NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," provides a status of nuclear power plant Year 2000 readiness as of September 1, 1999, and a description of past and future NRC actions to verify Y2K readiness in operating U.S. reactors. The NUREG combines the results of the staff reviews with the July 1, 1999, licensee responses to Generic Letter 98-01, Supplement 1, “Year 2000 Readiness of Computer Systems at Nuclear Power Plants.” Based on information contained in the NUREG, the staff has concluded that safety systems at all 103 nuclear power plants are Y2K ready. The remaining Y2K system deficiencies are in either non-safety systems involving power generation or administrative/support systems not involving power generation. As of September 1, 1999, the staff concludes that licensees of 75 plants are fully Y2K ready. In addition, the staff projects that 83 of the 103 plants are currently scheduled to be fully Y2K ready by September 30, 1999. The results of this review, updated to account for licensees which completed Y2K remediation efforts in July and August, are provided in the attached Summary Table (Attachment 1).

4.1 Plants that Completed Y2K Program Activities by July 1, 1999

As of July 1, 1999, licensees of 68 reactors reported that all Y2K readiness activities were completed, including remediation and contingency planning. With the exception of Cooper (which has integrated contingency plan and several minor non-safety equipment issues), these plants will not undergo additional Y2K-related inspections. Cooper reported completion of their Y2K program activities on September 2, 1999, and will receive a supplemental TI 2515/141 followup inspection.

4.2 Plants Scheduled to Complete Y2K Program Activities by September 30, 1999

As previously stated, staff review of licensee responses to the generic letter conclude that 75 plants were fully Y2K ready as of September 1 and that a total of 83 plants are projected to be fully Y2K ready by September 30. Plants scheduled to complete Y2K program activities by September 30 include the following:

Beaver Valley 1 & 2	Clinton	Cooper
Limerick 2	Oyster Creek	Peach Bottom 2
Vermont Yankee		

Plants with a projected completion date by September 30, 1999, will be monitored by regional staff to ensure that the schedules are maintained. Staff confirmation of the completion of plant-specific items identified by licensees in the generic letter responses will be documented in routine NRC inspection reports. No additional Y2K-oversight is planned unless site-specific issues arise that indicate further scrutiny would be advisable or changes in completion dates delay plant Y2K readiness beyond September 30, 1999.

4.3 All Other Plants

Consistent with the SRM and as a followup to the licensee’s GL 98-01 response, the staff is proposing additional actions for the 20 plants that are not scheduled to complete their Y2K program activities prior to September 30. Action will be taken in a graded approach depending

on the nature of the deficiencies and will be in the form of letters confirming the staff's understanding of (1) those systems having Y2K deficiencies and (2) the licensee's projected completion date. All letters are scheduled to be issued by September 30, 1999. In addition, staff will monitor each licensee's progress to ensure that schedules do not slip.

Through agreement with NEI, all licensees are expected to provide a written response documenting final completion of their Y2K program activities. The staff is planing to verify completion of these activities through routine inspection reports. At this time, the staff does not believe that regulatory action, in the form of Orders or Confirmatory Action Letters, will be necessary.

Each of these 20 plants has been examined to identify the systems and components that are not Y2K-ready. While all plants have reported that systems needed for reactor safety and reactor protection are Y2K-ready, each of these plants has Y2K deficiencies in one or both of categories "B" and "C", below. A detailed breakdown of individual plant status is provided in NUREG-1706.

(A) Systems affecting safety

This category includes plants with systems and components that are not Y2K-ready and whose direct, on-line functioning is required for nuclear safety or reactor protection, including safe reactor shutdown and mitigation of design basis events (for example, systems covered by license conditions, including technical specifications). Plants without completed contingency plans for these systems and components are also included in this category.

Based on licensee submittals and NRC audits and inspections, the NRC staff has determined that there are no plants in this category. Systems required for safe operation and shutdown are Y2K-ready at all 103 operating reactors.

(B) Systems affecting plant operations

This category includes plants with systems and components that are not Y2K-ready and have the potential to cause a transient during the Y2K transition. Plants without completed contingency plans for these systems and components are also included in this category.

The following 9 plants are included in this category and will be sent a letter (Attachment 2).

Comanche Peak 1	Diablo Canyon 1 & 2	Farley 2
Peach Bottom 3	Salem 1	South Texas 1 & 2
Three Mile Island 1		

In consideration of the importance that the NRC places on making these Y2K remediation efforts sufficiently in advance of the Y2K transition date, licensees will be requested to inform the staff of (1) changes in the Y2K system deficiencies as stated, or (2) any changes in the projected completion schedule. This is to efficiently schedule regional inspections to verify completion of the Y2K work. Licensees will be requested to submit a letter documenting when the work is complete.

With one exception, all of the above plants are scheduled to complete Y2K remediation efforts by November 30, 1999. The one exception, Farley Unit 2, has scheduled a completion date of December 16, 1999, as part of their fall refueling outage. Considering that the same modification was successfully completed at Farley Unit 1, the staff has confidence that the licensee will complete the work within the projected schedule.

(C) Systems not affecting safety or plant operations (support systems)

This category includes plants (not included in the above categories) with other systems and components that are not Y2K-ready and/or have incomplete contingency plans for these systems and components. These systems and components, which are considered administrative or support in nature, would not have the potential to cause a transient during the Y2K transition.

The following 11 plants are included in this category and will be sent a letter (Attachment 3).

Browns Ferry 2 & 3	Comanche Peak 2	Cook 1 & 2
Hope Creek	North Anna 2	Salem 2
Sequoyah 1 & 2	Watts Bar 1	

Licensees of the above plants will not be asked to respond to our letters provided that they agree with both the characterization of the systems and/or components that are not Y2K ready and the projected completion schedule. Routine inspection monitoring will follow licensee onsite activities and will verify completion of these Y2K activities.

Attachments: 1 Summary Table
2 Sample Letter - Category B
3 Sample Letter - Category C

Nuclear Power Plant (NPP) Y2K Readiness Status as of September 1, 1999		
NPP Name	**Completion Status/Date**	**Systems Impacted***
Arkansas 1 and 2	Y2K Ready	--
Beaver Valley 1 and 2	9/30/99	Operations
Braidwood 1 and 2	Y2K Ready	--
Browns Ferry 2 and 3	10/31/99	Admin.
Brunswick 1	Y2K Ready	--
Brunswick 2	Y2K Ready	--
Byron 1 and 2	Y2K Ready	--
Callaway	Y2K Ready	--
Calvert Cliffs 1 and 2	Y2K Ready	--
Catawba 1 and 2	Y2K Ready	--
Clinton	9/22/99	Operations
Comanche Peak 1	11/30/99	Operations
Comanche Peak 2	10/30/99	Admin.
Cooper	9/20/99	Operations
Crystal River 3	Y2K Ready	--
Davis-Besse	Y2K Ready	--
D.C. Cook 1 and 2	10/30/99	Admin.
Diablo Canyon 1 and 2	10/31/99	Operations
Dresden 2 and 3	Y2K Ready	--
Duane Arnold	Y2K Ready	--
Farley 1	Y2K Ready	--
Farley 2	12/16/99	Operations
Fermi 2	Y2K Ready	--
Fitzpatrick	Y2K Ready	--
Fort Calhoun	Y2K Ready	--
Ginna	Y2K Ready	--
Grand Gulf	Y2K Ready	--
Harris	Y2K Ready	--
Nuclear Power Plant Y2K Readiness Status as of September 1, 1999 (continued)		
NPP Name	**Completion Status/Date**	**Systems Impacted***
Hatch 1 and 2	Y2K Ready	--
Hope Creek	10/29/99	Admin.

Nuclear Power Plant Y2K Readiness Status as of September 1, 1999 (continued)		
NPP Name	**Completion Status/Date**	**Systems Impacted***
Indian Point 2	Y2K Ready	--
Indian Point 3	Y2K Ready	--
Kewaunee	Y2K Ready	--
LaSalle 1 and 2	Y2K Ready	--
Limerick 1	Y2K Ready	--
Limerick 2	9/30/99	Operations
McGuire 1 and 2	Y2K Ready	--
Millstone 2 and 3	Y2K Ready	--
Monticello	Y2K Ready	--
Nine Mile Point 1 and 2	Y2K Ready	--
North Anna 1	Y2K Ready	--
North Anna 2	10/29/99	Admin.
Oconee 1, 2 and 3	Y2K Ready	--
Oyster Creek	9/30/99	Admin.
Palisades	Y2K Ready	--
Palo Verde 1, 2 and 3	Y2K Ready	--
Peach Bottom 2	9/30/99	Operations
Peach Bottom 3	10/31/99	Operations
Perry	Y2K Ready	--
Pilgrim	Y2K Ready	--
Point Beach 1 and 2	Y2K Ready	--
Prairie Island 1 and 2	Y2K Ready	--
Quad Cities 1 and 2	Y2K Ready	--
River Bend	Y2K Ready	--
Robinson 2	Y2K Ready	--
Salem 1	11/6/99	Operations
Salem 2	10/29/99	Admin.
San Onofre 2 and 3	Y2K Ready	--
Seabrook	Y2K Ready	--
Sequoyah 1 and 2	10/31/99	Admin.
South Texas 1 and 2	10/31/99	Operations
St. Lucie 1 and 2	Y2K Ready	--
Summer	Y2K Ready	--
Surry 1 and 2	Y2K Ready	--

Nuclear Power Plant Y2K Readiness Status as of September 1, 1999 (continued)		
NPP Name	**Completion Status/Date**	**Systems Impacted***
Susquehanna 1 and 2	Y2K Ready	--
Three Mile Island 1	10/21/99	Operations
Turkey Point 3 and 4	Y2K Ready	--
Vermont Yankee	9/30/99	Admin.
Vogtle 1 and 2	Y2K Ready	--
Washington Nuclear 2	Y2K Ready	--
Waterford 3	Y2K Ready	--
Watts Bar	10/31/99	Admin.
Wolf Creek	Y2K Ready	--

*Staff review has concluded that safety-related systems for all plants are Y2K ready. Systems needed for continued plant operations are denoted “Operations” whereas administrative or support systems are denoted “Admin.”

[LICENSEE'S NAME AND ADDRESS]

SUBJECT: **[PLANT NAME(S)]** — RESPONSE TO GENERIC LETTER 98-01, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS" (**TAC NO.(S)**)

Dear **[LICENSEE'S NAME]:**

In Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants" and its Supplement 1, we requested utilities to submit plans and schedules for resolving Y2K-related issues. We have received and reviewed all licensees' corrective plans and schedules. Based on our review of licensee responses and our onsite assessment of licensee Y2K activities as described in NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," we have concluded that there are no nuclear plants with Y2K issues involving safety systems.

Increased public awareness and attention to the Y2K issue has resulted in concern over the ability of nuclear power plants to provide uninterrupted power to the national electric power grid during the Y2K transition. In this regard, we are focusing attention beyond those systems necessary to maintain safety. Consequently, we are closely monitoring those plants having Y2K deficiencies in systems that could impact plant operation that are not scheduled for remediation prior to September 30, 1999. As you are aware, a Y2K deficiency in certain systems or components might cause a transient during the Y2K transition that could affect the national electric power grid.

In your letter of **[USE APPLICABLE DATE]**, for **[LIST APPLICABLE PLANT NAMES]** you stated the following:

- The **[LIST APPLICABLE PLANT NAMES]** will not be Y2K ready until you make changes to the **[LIST SPECIFIC SYSTEMS NEEDING Y2K REMEDIATION]**
- You intend to make these system changes by **[LIST DATE].**

It is our understanding that at least one of the systems or components listed above, which are currently not Y2K ready, may have the potential to cause a transient during the Y2K transition or be important to continued power operation at your facility. The NRC considers it important to complete these Y2K remediation efforts in advance of the Y2K transition date. To efficiently schedule regional inspections to verify completion of the Y2K work, you are requested to inform the staff of any changes in (1) the scope of the Y2K system deficiencies listed above, or (2) your projected completion schedule. Please submit a letter documenting when work is complete.

We would like to acknowledge the efforts you have completed to date in preparing your plant for the Y2K transition and appreciate your continued cooperation on this important issue.

The collection of this information is covered by OMB Clearance 3150-0012 which expires on June 30, 2000. We estimate that the effort to collect this information and report back to us by letter will take approximately 8 hours.

Please contact me at **[PROJECT MANAGER'S TELEPHONE NO.]** if you have any questions.

Sincerely,

[PROJECT MANAGER SIGNATURE BLOCK]

Docket No**[s]**

cc: See next page

SAMPLE LETTER

[LICENSEE'S NAME AND ADDRESS]

SUBJECT: **[PLANT NAME(S)]** — RESPONSE TO GENERIC LETTER 98-01, "YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS" (**TAC NO.(S)**)

Dear **[LICENSEE'S NAME]:**

In Generic Letter 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants" and its Supplement 1, we requested utilities to submit plans and schedules for resolving Y2K-related issues. We have received and reviewed all licensees' corrective plans and schedules. Based on our review of licensee responses and our onsite assessment of licensee Y2K activities as described in NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," we have concluded that there are no nuclear plants with Y2K issues involving safety systems.

Increased public awareness and attention to the Y2K issue has resulted in concern over the ability of nuclear power plants to provide uninterrupted power to the national electric power grid during the Y2K transition. In this regard, we are focusing attention beyond those systems necessary to maintain safety. Consequently, we are closely monitoring those plants having Y2K deficiencies in systems that could impact plant operation that are not scheduled for remediation prior to September 30, 1999. As you are aware, a Y2K deficiency in certain systems or components might cause a transient during the Y2K transition that could affect the national electric power grid.

In your letter of **[USE APPLICABLE DATE]**, for **[LIST APPLICABLE PLANT NAMES]** you stated the following:

- The **[LIST APPLICABLE PLANT NAMES]** will not be Y2K ready until you make changes to the **[LIST SPECIFIC SYSTEMS NEEDING Y2K REMEDIATION]**
- You intend to make these system changes by **[LIST DATE].**

It is our understanding that the systems and/or components listed above, which are currently not Y2K ready, can be categorized as administrative or support in nature and would not have the potential to cause a transient during the Y2K transition. Regional inspection activities are being planned to verify completion of these activities. If you agree with both the above characterization of the systems and/or components that are not Y2K ready and the projected completion schedule, you do not need to respond to this letter. However, you are requested to inform the NRC when the work is complete.

We would like to acknowledge the efforts you have completed to date in preparing your plant for the Y2K transition and appreciate your continued cooperation on this important issue.

The collection of this information is covered by OMB Clearance 3150-0012 which expires on June 30, 2000. We estimate that the effort to collect this information and report back to us by letter will take approximately 8 hours.

Please contact me at **[PROJECT MANAGER'S TELEPHONE NO.]** if you have any questions.

Sincerely,

[PROJECT MANAGER SIGNATURE BLOCK]

Docket No**[s]**

cc: See next page

As indicated in SECY 97-213, Appendix C, the NRC staff conducted an assessment of selected licensees' activities for dealing with the Year 2000 problem. Licensees involved included:

NRC Licensees

(See sample letter/questionnaire to NRC licensees. A similar set of questions was also published in the Health Physics Society *Newsletter*)

- BWX Technologies (Fuel Facility)
- Cogema Mining (Uranium Extraction)
- Georgetown University (Broad Scope and Medical)
- Mallinckrodt Medical Inc. (Radiopharmaceutical Manufacturer)
- National Institute of Standards and Technology
- US Enrichment Corporation (Gaseous Diffusion Plants)

Agreement State Licensee

- Sterigenics (Large Irradiators) North Carolina.

Telephone Interviews

- Ohmart Humbult Scientific, Inc.(Gauge Manufacturer)
- Seaman Nuclear Corp. (Gauge Manufacturer)
- Troxler Electronics (Gauge Manufacturer)
- General Nucleonics (Gauge Manufacturer)
- PECO Control Corp. (Gauge Manufacturer)
- LFE Industrial Corp. (Gauge Manufacturer)
- Electa (Gamma Knife Distributor)
- Theratronics (Teletherapy Device Manufacturer)

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Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

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No. 00-004

January 01, 2000

ALL NUCLEAR FACILITIES IN THE UNITED STATES

TRANSITION SAFELY THROUGH Y2K ROLLOVER

Four nuclear power plants in California and one in Washington in the Pacific Time Zone have reported to the Nuclear Regulatory Commission that they have transitioned safely through the Y2K rollover.

As of 3:15 a.m. E.S.T., the Diablo Canyon and San Onofre nuclear plants in California and Washington Nuclear reported no operational problems to the NRC after midnight. This completes the successful transition of all 103 operating nuclear plants and two gaseous diffusion facilities through the Y2K transition.

Although all of the commercial nuclear power plants have completed the rollover into the new millennium, the NRC will continue to closely monitor operations in the coming days when other problems might arise.

Years of hard work by the NRC and the nuclear industry have paid off in a smooth transition through the new millennium, NRC Chairman Richard A. Meserve said.

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Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

Telephone: 301/415-8200 -- E-mail: opa@nrc.gov

No. 003

January 01, 2000

ALL NUCLEAR FACILITIES IN MOUNTAIN TIME ZONE TRANSITION SAFELY THROUGH THE Y2K ROLLOVER

All three of the nuclear power plants in the Mountain Time Zone (Palo Verde plants located 36 miles west of Phoenix, Arizona) have reported to the Nuclear Regulatory Commission that they have transitioned safely through the Y2K rollover.

As of 2:15 a.m. today, 98 of the nation's 103 operating nuclear power plants and both gaseous diffusion plants have transitioned safely through the Y2K rollover. Four reactors in California and one in Washington are awaiting the arrival of midnight.

##

Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

Telephone: 301/415-8200 -- E-mail: opa@nrc.gov

No. 002

January 01, 2000

All NUCLEAR FACILITIES IN THE MIDWEST TRANSITION SAFELY THROUGH THE Y2K ROLLOVER

All 35 nuclear power plants and one fuel facility in the Central Time Zone have reported to the Nuclear Regulatory Commission that they have transitioned safely through the Y2K rollover.

As of 1:30 a.m. today, 95 of the nation's 103 operating nuclear power plants and both fuel cycle facilities have transitioned safely through the Y2K rollover. Eight reactors in the Pacific and Mountain Time Zones are awaiting midnight as the NRC continues to monitor their operations from its emergency operations center in Rockville, Maryland.

##

Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

Telephone: 301/415-8200 -- E-mail: opa@nrc.gov

No. 001

January 01, 2000

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ALL NUCLEAR FACILITIES IN EASTERN UNITED STATES

TRANSITION SAFELY THROUGH Y2K ROLLOVER

All 60 nuclear power plants and one fuel facility in the Eastern United States have reported to the Nuclear Regulatory Commission that they have transitioned safely through the Y2K rollover. There are a total of 103 operating nuclear power plants and two fuel facilities in the United States.

Plants from New Hampshire to Florida were operating normally as the focus of the NRC's attention prepared to shift to the mid-west where another 35 nuclear plants and an additional fuel cycle facility in the Central Time Zone prepare for midnight.

"The NRC will continue to monitor the operations of all of the commercial nuclear power plants and fuel cycle facilities in the U.S. for any Y2K-related problems," NRC Chairman Richard A. Meserve said from the agency's emergency operations center in Rockville, Md. "So far things look good and we are heartened to see that years of hard work by the NRC and the nuclear industry are paying off in a smooth transition through the new millennium."

The Chairman added that the real test of the nuclear industry's efforts will come within the next few days when other problems might arise.

Three nuclear power plants safely shut down in the past 36 hours in South Carolina, Georgia and Pennsylvania although the shutdowns are not believed to be Y2K-related. All of the plants are in stable condition.

The Limerick nuclear power plant, operated by PECO Energy Co., about 20 miles northwest of Philadelphia, shut down about 1:10 a.m. December 31, due to a failure of the plant's main electrical transformer. The reactor shut down without any complications and is stable.

The Catawba nuclear power plant, operated by Duke Power. Co., near Rock Hill, S.C., automatically shut down about 6:20 p.m. Thursday, December 30, without any complications. The cause of the shutdown appears to have been an equipment failure.

The Vogtle nuclear reactor, operated by the Southern Nuclear Operating Co., about 25 miles southeast of Augusta, Ga., was manually shut down shortly before 5 p.m. Thursday, December 30, because of an

equipment problem. The problem was corrected and the plant is restarting.

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Nuclear Regulatory Commission

Office of Public Affairs -- Region II

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Roger Hannah (Phone 404/562-4417, E-mail: rdh1@nrc.gov)

No: II-99-58

December 30, 1999

NRC Region II to Monitor Nuclear Plants in The Southeast During Y2k Transition

The Nuclear Regulatory Commission's Region II office in Atlanta will monitor the status of commercial nuclear power plants in the southeastern United States during the Year 2000, or Y2K rollover, from Dec. 31 through New Year's Day. The Region II Incident Response Center will be fully staffed and an inspector will be stationed at each plant site during the transition period.

From 9 p.m. on Dec. 31 through 9 a.m. on Jan. 1, a Region II public affairs officer will be available to answer news media questions regarding those plants. The contact phone numbers during those hours are: **(404) 562-4468 or (404) 562-4480.**

In addition, news releases providing status updates on the facilities will be issued and will be posted on the NRC's web site at www.nrc.gov/OPA

For details on the entire agency's Y2K staffing plans, see NRC News Release No. 99-271 at the same web location.

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Nuclear Regulatory Commission

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I-99-105

December 28, 1999

NRC Region I to Monitor Northeast Plants During Y2K Transition

The Nuclear Regulatory Commission's Region I office in King of Prussia, Pa., will monitor the status of commercial nuclear power plants in the Northeastern United States during the Year 2000, or Y2K rollover, from Dec. 31 through New Year's Day. The Region I Incident Response Center will be fully staffed and an inspector will be stationed at each plant site during the transition period.

From 10 p.m. on Dec. 31 through 2 p.m. on Jan. 1, a Region I public affairs officer will be available to answer news media questions regarding those plants. The contact phone number is (610) 337-5360.

In addition, press releases providing status updates on the facilities will be issued and will be posted on the NRC's web site at www.nrc.gov/OPA/ .

For details on the entire agency's Y2K staffing plans, see NRC press release No. 99-271 at the same web location.

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United States Nuclear Regulatory Commission

Office of Public Affairs

Washington, DC 20555

Phone 301-415-8200 Fax 301-415-2234

Internet: opa@nrc.gov

No. 99-271

December 23, 1999

***Note to Editors:* NRC Staffing for Media Assistance During Y2K Transition**

The Nuclear Regulatory Commission will have staff available to assist the news media with its coverage of the millennium rollover, December 31st through New Year's Day.

From 10 a.m. December 31 through 9 a.m. January 1, NRC Public Affairs staff and an agency spokesperson will be available at the Joint Public Information Center (JPIC) in Washington, D.C. The President's Council on Year 2000 Conversion established the JPIC to provide reporters with news about Y2K-related developments across the Federal Government, State, local and tribal governments, critical areas of the private sector and countries around the world. Only pre-badged reporters will be allowed into the JPIC. Any television interviews with NRC will be conducted at the JPIC throughout the Y2K transition. NRC staff can be reached at the JPIC for Y2K information on U.S. nuclear facilities by calling (202) 535-3009 or (202) 456-7010.

Public Affairs staff also will be available at NRC headquarters in Rockville, Maryland, from 9 p.m. December 31 to 5 p.m. New Year's Day, to handle inquiries and to distribute periodic press releases on the status of nuclear power plants across the country. Press releases from headquarters will be issued as soon after midnight as possible corresponding to each of the four U.S. time zones and will be available on the Web at www.nrc.gov/OPA/. Public affairs staff can be reached at (301) 415-8200 and on the internet at opa@nrc.gov.

Public Affairs staff will be available at each of the NRC's four regional incident response centers from 10 p.m. New Year's Eve through 9 a.m. New Year's Day in order to respond to events at plants in their regions, if the need arises. They will be located at centers in King of Prussia, Pennsylvania; Atlanta, Georgia; Lisle, Illinois; and Arlington, Texas.

The NRC plans to issue at least four cumulative press releases corresponding closely to the four time zones in the U.S. The first news release will report on the status of 60 operating nuclear power plants and one gaseous diffusion plant (GDP) in the Eastern Time Zone, the second press release will add the status of 35 nuclear plants and one GDP in the Central Time Zone, the next one will add the three nuclear plants in the Mountain Time Zone, and the fourth press release will cover all plants, adding the five nuclear plants in the Pacific Time Zone. Other news releases will be issued as the need arises.

A map showing the location of all 103 operating nuclear power plants is attached, along with a list of the plants in each time zone.

All operating nuclear plants areY2K-ready. Based on our review of responses from the nuclear power industry concerning Y2K readiness, our independent inspections at all plants, and our ongoing regulatory oversight activities, we believe that Y2K problems will not adversely affect the continued safe operation of U.S. nuclear power plants through the Y2K transition and beyond, and should contribute to electric grid stability. Although the need for NRC action during the Y2K transition is considered unlikely, the NRC will have an inspector stationed at each nuclear power plant site and gaseous diffusion plant site to augment staff in headquarters and regional incident response centers.

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[**NRC Home Page** | **News and Information** | **E-mail**]

United States Nuclear Regulatory Commission

Office of Public Affairs

Washington, DC 20555

Phone 301-415-8200 Fax 301-415-2234

Internet: opa@nrc.gov

No. 99-268

December 23, 1999

NRC Finds No Outstanding Y2K Problems at Nuclear Plants Undergoing Decommissioning

The NRC has completed follow-up onsite reviews of selected nuclear power plants undergoing decommissioning and found no problems with their Y2K program activities.

The primary Year 2000 (Y2K)-related health and safety concern at plants that no longer generate power and are being decommissioned is to assure sufficient cooling and shielding of the spent fuel in water-filled spent fuel pools. Currently, there are 19 permanently shut down nuclear power plants, 14 of which have spent fuel remaining on site.

Starting in early December, NRC reviewed those six facilities that have been shut down in the last four years and thus have the highest level of heat generated from the natural decay of spent fuel. The plants are: Maine Yankee, Millstone 1, Haddam Neck, Big Rock Point, and Zion Units 1 and 2. Reviews covered management controls, staffing, system and component repairs or replacements, and plans for responding to any unexpected event. The remaining eight plants (shut down for more than four years) have spent fuel that generates relatively low levels of heat and can remain in a safe state for three to four weeks, if there is an interruption in the cooling system.

Early this year, the NRC staff contacted all decommissioning reactor licensees and determined that they were addressing Y2K readiness, but no onsite reviews of Y2K activities were conducted. The likelihood of Y2K-related problems causing hazardous conditions at a nuclear power plant undergoing decommissioning is relatively low because heat loads are low, procedures are in place to respond to off-normal situations, and systems in the plant are mostly analog and unaffected by Y2K computer issues. Nevertheless, computer-based systems may be used for some applications such as security, health physics monitoring, or record keeping and such systems could be impacted by a Y2K problem.

To provide added assurance of confidence in the safety of these facilities, the NRC decided to review a selected group of nuclear power plants being decommissioned. NRC reviews confirmed that the licensees for these facilities have adequately addressed Y2K computer issues.

Results of these reviews will be included in the next periodic inspection report for each site and will be available to the public.

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United States Nuclear Regulatory Commission

Office of Public Affairs

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Phone 301-415-8200 Fax 301-415-2234

Internet: opa@nrc.gov

No. 99-240

November 8, 1999

NRC Confirms That All Nuclear Power Plants Are Fully Y2K-ready

The Nuclear Regulatory Commission has received notification by all 103 operating nuclear power plants that they have completed remediation efforts to be fully "Y2K-ready"-that is, all plant systems involved with safety, power generation, and plant support are now prepared to roll over into the Year 2000 without computer problems.

Safety-related systems at all 103 plants have been Y2K-ready since July 1. At that time, sixty-eight of the plants were declared fully Y2K-ready while 35 had remaining work on non-safety systems (those systems involved with power generation and plant support). During the past four months, NRC has confirmed satisfactory completion of the remaining work that has resulted in all plants now being fully Y2K- ready.

Based on our review of responses from the nuclear power industry concerning Y2K readiness, our independent inspection efforts at all 103 plants, and our ongoing regulatory oversight activities, we conclude that the Y2K problem will not adversely affect the continued safe operation of U.S. nuclear power plants, and should contribute to grid stability during the transition period.

Detailed information on NRC's Y2K activities are available on the web site at http://www.nrc.gov/NRC/NEWS/year2000.html .

The "Year 2000" or "Y2K" problem refers to a computer's potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, a computer system could read "00" as 1900, rather than 2000, potentially causing a computer system to malfunction. "Y2K-ready" means that the function provided by a computer will be carried out successfully with the coming of the Year 2000.

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United States Nuclear Regulatory Commission

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Internet: opa@nrc.gov

No. 99-220

Tuesday, October 19, 1999

NRC Conducts Full-scale Emergency Preparedness Exercise in Preparation for Y2K

In preparation for the "Year 2000," the Nuclear Regulatory Commission conducted a full-scale exercise October 15 to test its Y2K contingency plan. Involved in the exercise were the headquarters operations center, NRC's regional incident response centers, three fuel cycle facilities and 11 nuclear power plants.

The exercise was conducted to test the readiness of the NRC to deal with possible events during the transition to the Year 2000. The exercise tested the three major facets of the agency's Y2K contingency plan - (1) the ability of the NRC to respond to Y2K-related events at a nuclear power plant or fuel cycle facility; (2) the ability to respond to licensee requests for enforcement discretion permitting a nuclear power plant that faces a Y2K-related problem to continue operating to support electrical grid stability; when safety is not an issue and (3) NRC's ability to share information with its licensees concerning Y2K problems.

The exercise successfully demonstrated the agency's ability to communicate with its licensees and the public during several simulated Y2K challenges. It also demonstrated the ability to retrieve information on the status of foreign nuclear power plants from the NRC-developed Y2K early warning system.

Twelve other countries participated in providing status reports during the NRC exercise. They were: Austria, Belgium, Canada, Finland, France, Germany, Japan, South Korea, the Netherlands, Spain, Switzerland, and Taiwan.

The agency also demonstrated its ability to identify and compensate for potential Y2K-related failures within its headquarters operations center. When a simulated communications failure occurred at headquarters, all operations shifted to the Region IV Office in Arlington, Texas, consistent with the agency's Y2K contingency plan. This included handling simulated emergency notifications from various NRC licensees, event responses, and enforcement discretion requests from licensees.

During the exercise, NRC officials tested communications with NRC inspectors at nuclear plants across the country that were participating in the exercise, including use of satellite-based communications systems, and provided timely and accurate status information to a simulated White House Information Coordination Center (ICC). A mock press conference with journalism students from American University was held at the simulated ICC Joint Public Information Center.

Overall, the exercise served to share information among the various organizations to assure all response efforts were coordinated and communicated effectively to protect public health and safety in the event of a Y2K-initiated event at a nuclear power plant or other licensed nuclear facility. The exercise was successful. However, several valuable lessons were learned which will allow the NRC to improve its preparedness for the Y2K transition. A summary of these lessons will be placed on the NRC website at the address listed below.

The "Year 2000" or "Y2K" problem refers to a computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction.

The NRC's Y2K Contingency Plan is currently available at:
http://www.nrc.gov/NRC/NEWS/year2000.html .

# # # # #

NRC Home Page | **News and Information** | **E-mail**

Nuclear Regulatory Commission

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No. 99-191

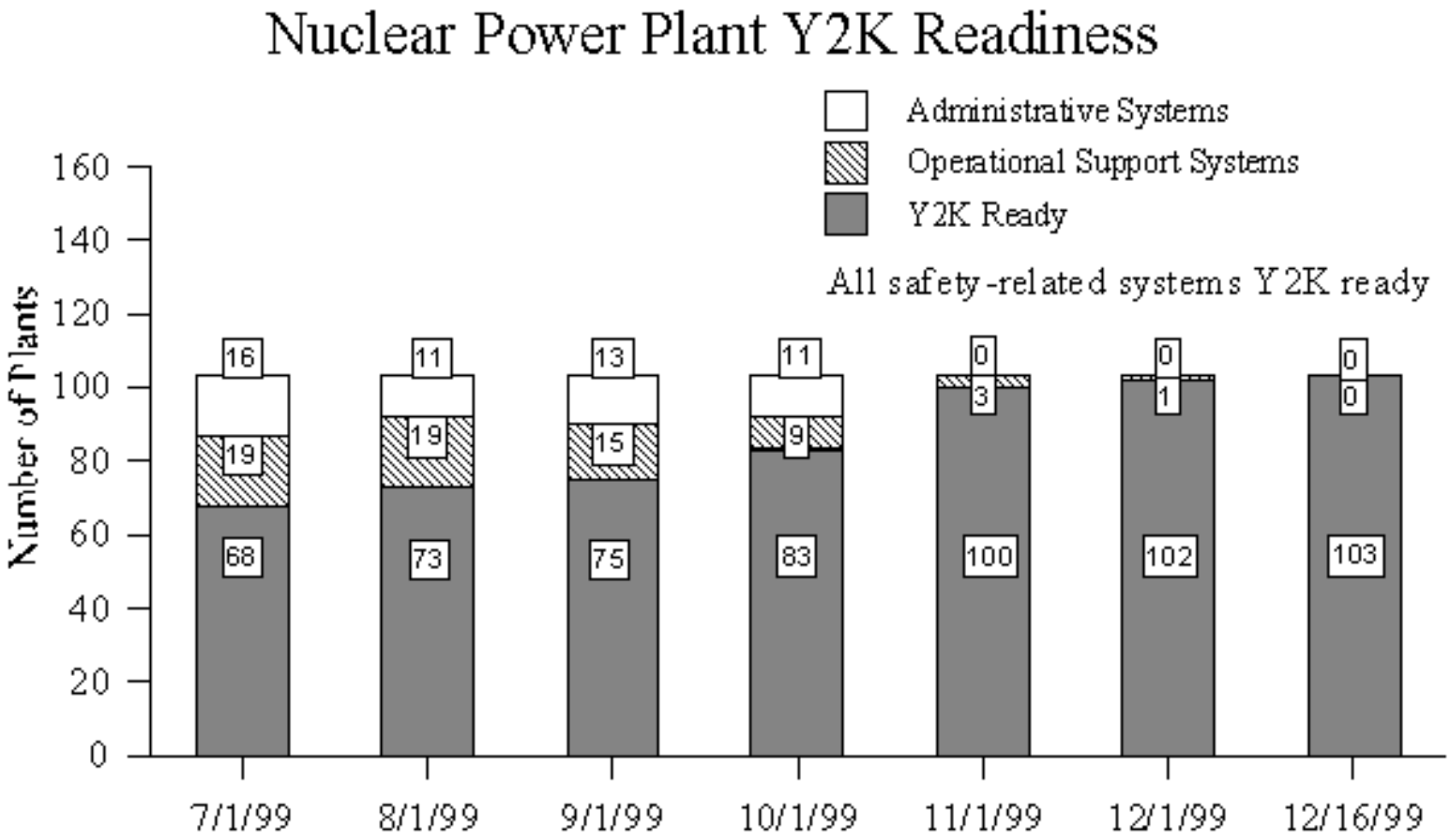
FOR IMMEDIATE RELEASE
(Tuesday, September 7, 1999)

NRC ISSUES REPORT CONFIRMING NO Y2K PROBLEMS AFFECTING SAFETY SYSTEMS OF NUCLEAR POWER PLANTS - UPDATES Y2K READINESS STATUS

The Nuclear Regulatory Commission has issued a report confirming by onsite reviews that at all 103 U.S. nuclear power plants there are no Y2K-related problems which affect the performance of safety systems needed to safely shut down the plants.

The report, NUREG-1706, "Year 2000 Readiness in U.S. Nuclear Power Plants," integrates the results of NRC's onsite reviews of all nuclear power plants and utilities' July 1 response on Y2K readiness. While all plants report Y2K readiness for safety systems used for shutdown, some plants are completing Y2K readiness activities for systems not required to safely shut down the plants.

The chart that follows depicts the path to timely Y2K readiness based on current information.



As depicted by this chart, all plants are expected to be fully Y2K ready prior to the transition period.

Typically, for those plants not fully Y2K ready, work will be completed in conjunction with a scheduled plant outage in the fall or when a replacement component is delivered. The NRC will continue to monitor and verify completion of all Y2K activities.

Most of the earlier NRC onsite reviews of licensee Y2K programs at the 103 plants provided sufficient information for the staff to conclude that licensee Y2K readiness programs were consistent with acceptable industry guidance. However, the NRC could not complete reviews of licensee programs for 14 plants because reviews were conducted early in April or May and these plants had not completed some of their Y2K preparations when NRC was on site.

In follow-up reviews of these 14 plants, the NRC determined that, in only one case, Cooper Nuclear Station, an integrated contingency plan (consistent with industry guidance) had not been completed even though this plant reported July 1 it was Y2K ready. As a result of this determination, the Cooper Station was categorized as "not Y2K ready" as of September 1 as reflected in the attached table on nuclear power plant Y2K readiness and NUREG-1706. Subsequently, on September 2, the licensee notified NRC that it had completed its integrated contingency plan, which the NRC will verify.

In addition, Cooper informed NRC it had discovered during an audit that three pieces of equipment were evaluated improperly by its contractor. (Typical Y2K programs involve the evaluation of over 2000 items). One piece of equipment was from an operational support system and the other two were from administrative systems. None of this equipment involved systems needed to safely shut down the plant. Cooper has notified NRC that it has corrected these deficiencies, reviewed the contractor's work, and determined there are no other deficiencies. The NRC has conducted inquiries to assure that this problem is unique to Cooper and

does not affect any other plants. The NRC has no indication that this problem extends to other plants.

In summary, the NRC concludes: (1) that at all 103 plants there are no Y2K concerns that could affect the performance of safety systems, (2) all licensees are following staff-approved industry guidance for achieving Y2K readiness, and (3) the completion schedules for the remaining few non-safety-related Y2K items will be completed before the transition from 1999 to 2000. At this time, the NRC believes that all licensees will be able to operate their plants safely during the Y2K transition and does not anticipate the need for the NRC to direct any significant plant-specific actions.

The full NUREG report is available on NRC's Y2K website at: www.nrc.gov/NRC/NEWS/year2000.html.

The following table provides the Y2K readiness status of U.S. operating nuclear power plants. As stated above, these are no Y2K concerns that could affect the performance of safety systems. For those plants not already fully Y2K ready, the projected completion date is indicated in the right column.

Table: Nuclear Power Plant Y2K Readiness Status as of September 1, 1999

Plant Name	Completion Status/Date
Arkansas 1 and 2	Y2K Ready
Beaver Valley 1 and 2	9/30/99
Braidwood 1 and 2	Y2K Ready
Browns Ferry 2 and 3	10/31/99
Brunswick 1	Y2K Ready
Brunswick 2	Y2K Ready
Byron 1 and 2	Y2K Ready
Callaway	Y2K Ready
Calvert Cliffs 1 and 2	Y2K Ready
Catawba 1 and 2	Y2K Ready
Clinton	9/22/99
Comanche Peak 1	11/30/99
Comanche Peak 2	10/30/99
Cooper	9/20/99
Crystal River 3	Y2K Ready
Davis-Besse	Y2K Ready
Diablo Canyon 1 and 2	10/3199
D.C. Cook 1 and 2	10/30/99
Dresden 2 and 3	Y2K Ready
Duane Arnold	Y2K Ready
Farley 1	Y2K Ready
Farley 2	12/16/99
Fermi 2	Y2K Ready
Fitzpatrick	Y2K Ready

Fort Calhoun	Y2K Ready
Ginna	Y2K Ready
Grand Gulf	Y2K Ready
Harris	Y2K Ready
Hatch 1 and 2	Y2K Ready
Hope Creek	10/29/99
Indian Point 2	Y2K Ready
Indian Point 3	Y2K Ready
Kewaunee	Y2K Ready
LaSalle 1 and 2	Y2K Ready
Limerick 1	Y2K Ready
Limerick 2	9/30/99
McGuire 1 and 2	Y2K Ready
Millstone 2 and 3	Y2K Ready
Monticello	Y2K Ready
Nine Mile Point 1 and 2	Y2K Ready
North Anna 1	Y2K Ready
North Anna 2	10/29/99
Oconee 1, 2 and 3	Y2K Ready
Oyster Creek	9/30/99
Palisades	Y2K Ready
Palo Verde 1, 2 and 3	Y2K Ready
Peach Bottom 2	9/30/99
Peach Bottom 3	10/31/99
Perry	Y2K Ready
Pilgrim	Y2K Ready
Point Beach 1 and 2	Y2K Ready
Prairie Island 1 and 2	Y2K Ready
Quad Cities 1 and 2	Y2K Ready
River Bend	Y2K Ready
Robinson 2	Y2K Ready
Salem 1	11/6/99
Salem 2	10/29/99
San Onofre 2 and 3	Y2K Ready
Seabrook	Y2K Ready
Sequoyah 1 and 2	10/31/99
South Texas 1 and 2	10/31/99
St. Lucie 1 and 2	Y2K Ready
Summer	Y2K Ready

Surry 1 and 2	Y2K Ready
Susquehanna 1 and 2	Y2K Ready
Three Mile Island 1	10/21/99
Turkey Point 3 and 4	Y2K Ready
Vermont Yankee	9/30/99
Vogtle 1 and 2	Y2K Ready
Washington Nuclear 2	Y2K Ready
Waterford 3	Y2K Ready
Watts Bar	10/31/99
Wolf Creek	Y2K Ready

Nuclear Regulatory Commission

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No. 99-187

FOR IMMEDIATE RELEASE
Thursday, September 2, 1999

NRC TO MEET WITH NEI TO DISCUSS NUCLEAR INDUSTRY'S
Y2K ACTIVITIES

The U.S. Nuclear Regulatory Commission staff will meet with officials of the Nuclear Energy Institute on Friday, September 10, in Rockville, Maryland, to discuss the status of Year 2000 (Y2K) readiness at nuclear power plants. Discussions will focus on industry activities to maintain Y2K readiness, share information among power plants, and report any changes in readiness to the NRC.

The meeting will be held at 9:00 a.m. in room O-8B4 at NRC's headquarters located at 11555 Rockville Pike. It will be open to public observation.

"Y2K" refers to a computer's potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, a computer system could read "00" as 1900, rather than 2000, potentially causing the computer system to malfunction.

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Nuclear Regulatory Commission

Office of Public Affairs

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No. 99-175

August 27, 1999

NRC DENIES THREE PETITIONS FROM NIRS ON YEAR 2000 CONCERNS

The Nuclear Regulatory Commission has denied three petitions for rulemaking from the Nuclear Information Resource Service on "Year 2000" (Y2K) concerns at NRC-licensed nuclear facilities.

In denying the petitions, submitted last December, the NRC agreed that the Y2K issue is significant and acknowledged the importance of the matters raised by petitioners. However, the NRC concluded that actions taken by nuclear plant licensees to address Y2K issues coupled with the NRC's oversight of these activities provide reasonable assurance of adequate protection of public health and safety. The agency believes that the petitions' issues are being addressed effectively without the need for new rules.

The first petition requested that all licensed facilities -- nuclear power plants, decommissioned nuclear plants, research reactors, and fuel cycle facilities -- should be shut down by December 1 if their safety systems are not "Y2K compliant" and should remain shut down until all Y2K repairs, modifications, replacements, and testing are completed.

The NRC denied this petition, in large part, based on agency inspections of Y2K program activities at 103 commercial nuclear power plants. The NRC has concluded that the safety systems necessary for the safe operation and safe shutdown of U.S. nuclear plants are Y2K ready.

The "Year 2000" or Y2K problem refers to a computer's potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, a computer system could read "00" as 1900, rather than 2000, potentially causing a computer system to malfunction. "Y2K compliant" means that a digital system and computer will accurately process date/time data during the Y2K transition from 1999 to 2000. This may require system repairs or replacements. "Y2K ready" means that functions provided by a computer system will be carried out successfully with the coming of the Year 2000.

The second petition for rulemaking requested that NRC require nuclear power plant licensees to conduct a successful, full-scale emergency planning exercise involving the failure of computers or other digital systems as a result of the Y2K problem. A plant would have to shut down by December 1, if the licensee had not conducted such an exercise and would remain shut down until it conducted such an exercise.

The NRC denied this petition because although the cause of computer or digital systems failures may be different under Y2K, the result and expected response from such failures are basically the same as

situations encountered and handled effectively during many previous emergency exercises and drills conducted by licensees. In addition, licensees have developed Y2K contingency plans which build on existing contingency plans that deal with a variety of circumstances, such as with the loss of pagers, radios, sirens, meteorology information, satellites, telephones, water and security police and fire-fighting capability. Also, considered in licensee's Y2K contingency planning process is the need for simulated exercises, development of special procedures, and training specific to Y2K contingencies. In October of this year, the NRC, with participation by several utilities, has scheduled a Y2K exercise that will test Y2K contingency plans. For these reasons, the NRC does not see a need to require additional emergency exercises.

The third petition requested NRC to require, during the Y2K transition, that nuclear facilities have operational emergency diesel generators that provide backup power to nuclear facilities; that there be a 60-day supply of fuel for these generators; and that there are alternate means of backup power such as solar panels, wind turbines, hydroelectric power, or biomass power. It also requested that spent fuel pools at nuclear plants have a backup power supply to cool the fuel in case offsite power is lost. Any plants not meeting these requirements would have to shut down.

The NRC agrees that maintaining reliable emergency power is important and considered the petitioner's request as part of NRC's review of existing regulatory requirements and licensee actions to assure reliable emergency power during the Y2K transition. Based on this review, the NRC denied this petition because current regulations require sufficient redundant backup power sources of onsite emergency power, normally provided by multiple emergency diesel generators, capable of supplying the electricity necessary to operate essential safety systems at nuclear power plants. Diesel generators are routinely tested and have demonstrated 98% reliability. In addition, licensees are required under NRC's maintenance rule to monitor the performance of diesel generators. With multiple sources of power, the need for alternate backup sources is not considered necessary to provide reasonable assurance of adequate protection against Y2K-induced problems.

Redundant power sources are not necessary at other facilities, such as decommissioned nuclear power plants, research reactors, and fuel cycle facilities, either because such power is not required to shut down and maintain the facilities in a safe condition, or because adequate measures are already in place to address loss of power. For spent fuel pools, emergency onsite power systems can provide adequate cooling if primary systems are lost. Upon detection of low levels of water in the pools, licensees have plans in place to provide make-up water. Even if no actions were taken immediately, there would be between three days and two weeks for the licensee to make up the water, lost through evaporation, to assure the fuel would remain covered.

The NRC considers the current 7-day fuel supply on site at nuclear power plants to be sufficient to handle operation of diesel generators in the event that offsite power is lost. As part of Y2K preparations, licensees are putting arrangements in place to replenish the fuel supply, if needed. However, Y2K problems are not expected to prolong the duration of a loss of offsite power for longer than that assumed in the licensee's normal emergency plans.

In developing decisions on the NIRS petitions, NRC considered the information provided in the petitions and comments received on the petitions. Based on the nuclear industry's Y2K planning and implementation activities, the oversight provided by the NRC in addressing the Y2K problem at licensed nuclear facilities, and the existing regulations, the agency decided to deny the three petitions.

More details on the NRC's decisions are contained in a staff paper, SECY-99-173, which should be available at: http://www.nrc.gov/NRC/COMMISSION/activities.html. A notice of denial will be published soon in the Federal Register.

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Nuclear Regulatory Commission

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No. 99-153

FOR IMMEDIATE RELEASE
(Thursday, July 22, 1999)

NRC ISSUES INTERIM ENFORCEMENT POLICY ON Y2K

The Nuclear Regulatory Commission approved issuance of an interim enforcement policy that allows the use of "enforcement discretion" under certain circumstances for nuclear power plants during Y2K transition periods.

The interim policy describes the process for utilities seeking exercise of "enforcement discretion" from the NRC during primarily the December 31 - January 1 transition. This process would allow a plant to continue operation without being in compliance with its license conditions, only if there is a minimal potential impact on safety while continued plant operation is considered necessary to help maintain a reliable and stable electrical grid. The interim policy builds on the agency's existing policy on exercise of enforcement discretion to consider the unique aspects associated with the Y2K transition.

Enforcement discretion will only be exercised if the NRC is satisfied that the action is consistent with protecting public health and safety and is warranted in the circumstances presented by the utility.

Prior communication with NRC and approval to exercise enforcement discretion to allow continued plant operation in certain circumstances are required. Without this approval utilities are expected to take actions in conformance with their license requirements and applicable regulations. A communications loss between nuclear power plants and the NRC is unlikely given the communications contingency plans developed. However, if established communication channels are lost, utilities could use the satellite telephone that NRC resident inspectors will have at each plant site to contact the agency and obtain approval for enforcement discretion, if necessary.

All nuclear plants are expected to be Y2K ready prior to December 31. The interim enforcement policy is part of NRC's contingency planning for Y2K. A request for comments on the interim policy was announced in a June 14 press release. As part of NRC's Y2K contingency planning, the agency will have staff available at its Operations Center December 31 to respond to Y2K issues and requests for enforcement discretion.

The interim policy applies to three Y2K transition or rollover periods: December 31, 1999 through January 3, 2000; February 28, 2000 through March 1, 2000; and December 30, 2000 through January 1, 2001.

The full text of the interim policy will be published shortly in the Federal Register and will be available in the NRC's Public Document Room, 2120 L Street, N.W., Washington, DC. It will also be available on NRC's Y2K web site at: http://www.nrc.gov/NRC/NEWS/year2000.html.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction. "Y2K ready" means that functions provided by computer systems will be carried out successfully with the coming of the Year 2000.

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Nuclear Regulatory Commission

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No. 99-152
FOR IMMEDIATE RELEASE
(Tuesday, July 20, 1999)

NRC FINDS 89 NUCLEAR POWER PLANTS IMPLEMENTING Y2K PROGRAMS CONSISTENT WITH GUIDANCE; 14 PLANTS REQUIRE NRC FOLLOW-UP

The Nuclear Regulatory Commission has identified 89 nuclear power plants that have followed Y2K programs and industry guidance that are acceptable to the agency. The NRC will conduct special follow-up reviews of the remaining 14 plants to verify that licensee Y2K readiness activities are consistent with the guidance. None of the follow-up reviews involves safety systems.

These findings are based on NRC's preliminary integrated assessment of Y2K readiness, comparing results of its recent onsite reviews at all 103 nuclear power plants with responses from licensees indicating their status of Y2K readiness as of July 1.

During the April - June 1999 time frame, the NRC conducted Y2K reviews at all operating nuclear power plants. All plants are using the NRC-approved industry guidance. Since some of the site reviews took place early, some Y2K activities at certain plants had not progressed sufficiently for the NRC to conclude that all activities were being implemented in accordance with industry guidance at the time of the on-site review. For example, a plant may not have completed repair or replacement of a plant component or may not have completed some aspect of contingency planning activities at the time of the NRC staff's review. Consequently, the NRC will conduct follow-up onsite reviews by mid-August at 14 plants, ten of which reported Y2K readiness of all systems by July 1.

The 14 nuclear power plants (units) scheduled for such a follow-up review are:

- Arkansas Units 1 and 2 (Russellville, AR)*
- Beaver Valley Units 1 and 2 (Shippingport, PA)
- Cooper (Brownville, NE)*
- Grand Gulf (Port Gibson, MS)*
- Indian Point Unit 2 (Buchanan, NY)*
- Prairie Island Units 1 and 2 (Red Wing, MN)*
- River Bend (St. Francisville, LA)*
- Summer (Jenkinsville, SC)*
- Three Mile Island Unit 1 (Middletown, PA)

- Vermont Yankee (Vernon, VT)
- Waterford (Taft, LA)*

*Plants reporting Y2K ready as of July 1

In their July 1 reports to NRC, all 103 operating nuclear power plants reported no Y2K problems which could directly affect the performance of safety systems. Sixty-eight reported all their computer systems and digital embedded components that support plant operations were Y2K ready. The remaining 35 plants reported plans for additional work on a few non-safety computer systems or devices to be fully Y2K ready, and provided their schedules to complete the work. None of these items are part of the safety systems designed to shut down a reactor or to keep it in a safe condition. The NRC will verify completion of the remaining activities for all 35 plants as they are completed.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction. "Y2K ready" means that functions provided by computer systems will be carried out successfully with the coming of the Year 2000.

Additional information on the preliminary integrated assessment can be found on NRC's Y2K web site at www.nrc.gov/NRC/NEWS/year2000.html. A final report incorporating results of the follow-up reviews is expected to be issued at the end of August.

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Nuclear Regulatory Commission

Office of Public Affairs

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No. 99-150

July 15, 1999

NRC HOSTED TABLETOP EXERCISE IN PREPARATION FOR Y2K

As part of preparations for the "Year 2000", the Nuclear Regulatory Commission conducted a tabletop exercise and training yesterday with Federal, State, and local organizations, and a nuclear utility to share information and understand how contingency plans would be used in response to a potential Year 2000 computer problem at a nuclear power plant after midnight on December 31.

Chairman Greta Joy Dicus indicated, in her opening remarks at the exercise, that the NRC and the nuclear industry have been pursuing a comprehensive program for dealing with potential Y2K problems at nuclear power plants and other nuclear facilities. The full text of her speech is available on NRC's website at www.nrc.gov/OPA/ .

About 50 participants representing NRC, Baltimore Gas and Electric -- licensee for Calvert Cliffs nuclear power plant located near Lusby, Md.,--the Federal Emergency Management Agency, the National Communications System (organization), the State of Maryland, Calvert County, and St. Mary's County, discussed a number of scenarios involving loss of communication among the various players, loss of offsite power to the nuclear power plant site, and the loss of power to NRC's Emergency Operations Center in Rockville, Md. Under each scenario, participants explained their roles and the procedures that would be followed should a Y2K problem occur during the December 31 - January 1 transition period.

The exercise served to share information among the various organizations to assure all response efforts are coordinated and communicated effectively to protect public health and safety in the event of a Y2K-initiated event at a nuclear power plant. It also served to refine NRC's Y2K Contingency Plan implementing procedures and prepare for a full-scale Y2K exercise to be conducted October 15.

All 103 operating nuclear power plants have reported their safety systems are Y2K ready. Sixty-eight of them have indicated that all of their systems --safety and non-safety-- are Y2K ready. The remaining 35 plants reported having to complete work on a few non-safety computer systems or devices to be fully Y2K ready.

The "Year 2000" or "Y2K" problem refers to a computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction. "Y2K ready" means that functions provided by computer systems will be carried out successfully with the coming of

the Year 2000.

A synopsis of the tabletop exercise will be available shortly on the NRC's Y2K website at: http://www.nrc.gov/NRC/NEWS/year2000.html. The NRC's Y2K Contingency Plan is currently available at this website.

Nuclear Regulatory Commission

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No. 99-138

FOR IMMEDIATE RELEASE
(Wednesday, July 7, 1999)

NUCLEAR POWER PLANTS REPORT SAFETY SYSTEMS ARE Y2K READY

The Nuclear Regulatory Commission has received reports from all 103 operating nuclear power plants (units) indicating that there are no Y2K-related problems which directly affect the performance of safety systems. Sixty-eight of these plants indicated that all of their computer systems that support safe plant operation are "Y2K ready."

The remaining 35 plants reported that they have additional work to complete on a few non-safety computer systems or devices to be fully Y2K ready and provided their schedules for completing the work. Of the 35 plants, about one third have remaining work involving systems needed for power generation. Other plants have work that deals with plant monitoring and administrative systems. None of the remaining work affects the ability of a plant to shut down safely, if needed.

Typically, the remaining Y2K work to be completed after July 1 is because of a scheduled plant outage in the fall or the necessity to wait for delivery of a replacement component for a plant.

These plants have actions remaining to be completed to be fully Y2K ready:

Plant Name	Location (Closest City)	Y2K Ready Date
Beaver Valley, Units 1 and 2;	Shippingport, PA	9/30/99
Browns Ferry, Units 2 and 3	Athens, AL	10/31/99
Brunswick, Unit 1	Southport, NC	11/30/99
Clinton	Clinton, IL	9/22/99
Comanche Peak, Unit 1	Glen Rose, TX	11/30/99
Comanche Peak, Unit 2	Glen Rose, TX	10/30/99
D.C. Cook, Units 1 and 2	Bridgman, MI	12/15/99
Davis-Besse	Port Clinton, OH	8/1/99
Diablo Canyon, Units 1 and 2	San Luis Obispo, CA	10/31/99
Farley, Unit 2	Columbia, AL	12/16/99
Hope Creek	Hancocks Bridge, NJ	10/29/99
Limerick, Unit 2	Limerick, PA	9/30/99
Monticello	Monticello, MN	9/1/99
North Anna, Unit 2	Mineral, VA	10/29/99

Oyster Creek	Toms River, NJ	9/30/99
Peach Bottom, Unit 2	Delta, PA	9/30/99
Peach Bottom, Unit 3	Delta, PA	10/31/99
Perry	Perry, OH	8/1/99
Salem, Unit 1	Hancocks Bridge, NJ	11/6/99
Salem, Unit 2	Hancocks Bridge, NJ	10/29/99
Sequoyah, Units 1 and 2	Soddy-Daisy, TN	10/31/99
South Texas, Units 1 and 2	Bay City, TX	10/31/99
St. Lucie, Units 1 and 2	Fort Pierce, FL	7/15/99
Three Mile Island, Unit 1	Middletown, PA	10/21/99
Turkey Point, Units 3 and 4	Florida City, FL	7/15/99
Vermont Yankee	Vernon, VT	10/31/99
Watts Bar	Spring City, TN	10/31/99

Additional Y2K information on all operating nuclear power plants is available at NRC's Y2K web site at http://www.nrc.gov/NRC/NEWS/year2000.html.

The NRC has been working with its licensees to ensure that potential Y2K issues have been identified and corrected. The NRC will continue to monitor progress at those plants which have remaining items of work and will independently verify completion of these items, including Y2K contingency plans -- procedures for dealing with unexpected events. All licensees are expected to be Y2K ready and have contingency plans in place before December 31. If, by the end of September, it appears that Y2K readiness activities will not be completed in advance of the December 31-January 1 transition, NRC will take appropriate action, including the issuance of shutdown orders, if warranted.

In addition to reviewing licensees' responses, the NRC is reviewing the results of its on-site Y2K reviews of all operating nuclear plants conducted over the past three months. By mid-July, the NRC will complete a preliminary summary of these reviews and the July 1 responses from licensees. A final report will be issued by the end of July and posted to NRC's Y2K web site.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction. "Y2K ready" means that functions provided by computer systems will be carried out successfully with the coming of the Year 2000.

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Nuclear Regulatory Commission

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No. 99-123

June 14, 1999

NRC PLANS FOR Y2K CONTINGENCIES

The Nuclear Regulatory Commission has developed a contingency plan for dealing with computer problems that could conceivably develop at a licensed nuclear facility at the start off the Year 2000. Part of the plan includes a proposed policy statement on the use of enforcement discretion during the Y2K transition.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It arises from computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction.

The NRC has been working with its licensees to ensure that potential Y2K issues have been identified and corrected and that the agency's own computer systems continue to function properly during the transition from 1999 into 2000. Based on NRC's Y2K reviews and audits of nuclear power plants and other licensed facilities, all licensees are expected to be Y2K ready well before December 31, and the Y2K transition will not affect continued safe operation of their facilities.

Although the need for NRC action during the Y2K transition is considered unlikely, the NRC has developed a contingency plan for ensuring that public health and safety and the environment will continue to be protected, even if unforeseen Y2K problems occur at a licensed nuclear facility. The plan has three major facets:

- Incident response -- How the agency will be prepared to respond if a safety-significant event should occur as a result of a Y2K problem at a nuclear power plant or other NRC-licensed facility.
- Information Sharing -- Communicating any Y2K problems reported by U.S. nuclear power plants or those abroad and passing on the information to domestic plant operators.
- Regulatory response -- Monitoring licensee activities during the Y2K transition. Being prepared to respond to licensees' requests that certain requirements for licensed facilities not be enforced so long as the safety implications are small and using such "enforcement discretion" would help maintain a reliable and stable electrical grid.

The plan calls for staffing NRC's headquarters Operations Center in Rockville, Maryland, beginning at noon on December 31. Backup will be provided by NRC's regional office in Arlington, Texas. NRC staff will be stationed at each nuclear power plant site and uranium enrichment facility site as well as in each

NRC regional Incident Response Center in King of Prussia, Pennsylvania; Atlanta, Georgia; and Lisle, Illinois. In addition, portable satellite telephones will provide backup communication, if needed, at each plant and facility site.

Comments received on the draft contingency plan published last December have been incorporated to the extent applicable. The full text of the final plan along with disposition of public comments is available from NRC's Public Document Room, 2120 L Street, N.W., Washington, D.C. and at our Y2K Website at http://www.nrc.gov/NRC/NEWS/year2000.html.

The proposed interim enforcement policy on exercising enforcement discretion during the Y2K transition is available for public comment at the same locations identified above. Comments will be considered in the next revision to NRC's enforcement policy.

United States Nuclear Regulatory Commission

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No. 99-122
FOR IMMEDIATE RELEASE

(Monday, June 14, 1999)

NOTE TO EDITORS:

The NRC will meet with officials of the Nuclear Energy Institute to discuss the nuclear industry's Y2K activities Tuesday (June 15) at 9:00 a.m. in room O-8B4 at NRC headquarters located at 11555 Rockville Pike, Rockville, Maryland. The NRC is located directly across from the White Flint Metro stop on the Red Line. The meeting is open to public observation.

Y2K refers to a computer's potential inability to recognize dates beginning with January 1, 2000. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). For example, computer systems could read "00" as 1900, rather than 2000, potentially causing computer systems to malfunction.

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No. 99-87

April 28, 1999

NUCLEAR POWER PLANTS ON TRACK FOR ACHIEVING Y2K COMPLIANCE

BY JULY 1

An audit of measures taken by 12 nuclear power plants to address potential computer problems at the start of the Year 2000 shows they are on schedule to meet the readiness target date of July 1.

No problems were found at the plants that will interfere with the ability of their computers to control key safety systems starting next year. The on-site audits were conducted by the Nuclear Regulatory Commission between last September and January of this year.

The "Year 2000" or Y2K problem, refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, potentially causing some plant systems or equipment to malfunction.

The plants audited included Brunswick (North Carolina), Hope Creek (New Jersey), Davis Besse (Ohio), Wolf Creek (Kansas), Monticello (Minnesota), Seabrook (New Hampshire), Watts Bar (Tennessee), Limerick (Pennsylvania), Waterford (Louisiana), North Anna (Virginia), Braidwood (Illinois), and WNP-2 (Washington State). They were chosen on the basis of design, geographic location and age to be generally representative of all 103 operating nuclear plants. Because licensee Y2K programs are corporate-wide, many of the NRC staff audits include more than a single nuclear power plant site, since many utilities own more than one nuclear plant. Hence, theY2K programs for 42 of the 103 operating power plants are included in the audits.

Results of these audits and a copy of the Information Notice sent by NRC to its licensees summarizing its findings will be posted to the NRC website at: http://www.nrc.gov/NRC/NEWS/year2000.html

NRC has no indication that Y2K computer-related problems exist with safety-related systems in nuclear power plants. Most commercial nuclear plants have protection systems that do not rely on computer dates and hence, are not vulnerable to the Y2K "bug." However, the audits did identify some problems in non-safety, but important computer-based applications that use embedded computer chips vulnerable to the Y2K problem. These include computer systems used to control personnel access systems within the plants, control room display systems, engineering programs, control systems, radiation monitoring

systems, and emergency response systems. In some instances, work on these systems may not be completed until the fall.

At the time of the audits, most NRC licensees were just beginning work on contingency plans to deal with unforseen Y2K problems. The NRC plans to assess the effectiveness of contingency plans during reviews to be conducted over the next few months at six other nuclear power plant sites - Palo Verde (Arizona), Oconee (South Carolina), Duane Arnold (Iowa), Indian Point 2 (New York), Turkey Point (Florida), and Diablo Canyon (California).

Licensees are also planning for the possible loss of off-site communications and the loss of off-site power in the event of instabilities of the electric power grids, the audits found. Although NRC regulatory oversight and authority does not extend to the U.S. electric power grid system, the agency recognizes the national importance of providing electricity to customers during the January 1, 2000 transition. Therefore, NRC has taken an interest in this matter and has received assurances from the North American Electric Reliability Council that it is working with NRC licensees to develop plans for handling generation and transmission problems.

Beginning this month, NRC inspectors will review Y2K programs at all 103 reactors - including those previously audited, to gather information that will be used to evaluate licensee Y2K readiness letters. Summaries of the results of those reviews will be made publicly available and will be posted on the NRC website. By July 1, licensees must submit written confirmation to NRC that their plants are or will be Year 2000 ready at the turn of the century and if not, must provide a status report, including detailed completion schedules for remaining work to ensure Year 2000 readiness.

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Nuclear Regulatory Commission

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No. 99-57

March 23, 1999

NRC TO REVIEW Y2K PROGRAMS AT ALL 103 OPERATING NUCLEAR PLANTS

AND CONDUCT SPECIAL CONTINGENCY PLAN AUDITS AT SIX PLANTS

The Nuclear Regulatory Commission will review Year 2000 computer program activities at all 103 operating nuclear power plants beginning April 1 to verify the status of licensee efforts to ensure the plants will be able to function safely on January 1, 2000, and beyond. In addition, the NRC will conduct special audits of Y2K contingency plans at six of those plants.

The reviews will allow NRC to check on the progress of all licensees and determine whether any regulatory action is needed. Information from the reviews also will be used in conjunction with status reports NRC has directed its power reactor licensees to provide by July 1.

The reviews will be conducted between April 1 and July 31 by NRC inspectors. The reviews will (1) verify that all NRC licensees have implemented Y2K program activities; (2) evaluate the progress they have made to assure they are on schedule to achieve Y2K readiness; and (3) assess their contingency plans for addressing Y2K-related problems.

Last fall, the NRC began audits at 12 nuclear power plants to evaluate the effectiveness of measures licensees are taking to identify and correct Y2K problems. Those audits, completed in January, did not reveal any problems suggesting NRC- licensed plants will be unable to achieve Y2K readiness.

No Y2K problems have been found that directly affect the proper functioning of safety systems in nuclear power plants. Those items requiring fixes at nuclear plants have typically been found in systems that support day-to-day plant operation -- such as data logs and personnel access controls -- but which are not necessary for the safe operation and shutdown of the plant.

Inspectors conducting the Y2K reviews will receive special training. Their inspection procedures and Y2K review checklist will be posted on the NRC Internet web page at: http://www.nrc.gov/NRC/NEWS/year2000.html. The NRC also plans to post results of the reviews after they are complete. This site has additional information relating to steps NRC is taking to deal with the Year 2000 problem.

The special contingency plan audits will be done at six sites: (1) Palo Verde in Arizona; (2) Oconee in South Carolina; (3) Duane Arnold in Iowa; (4) Indian Point 2 in New York; (5) Turkey Point in Florida; and (6) Diablo Canyon in California. These plants were selected on the basis of grid system, location,

design and age. The plants chosen for the contingency audits are different than the 12 plants previously audited to expand the group of licensees sampled. The audits at these facilities will examine in more detail backup measures the utilities have in place to deal with possible Y2K problems, either onsite or offsite, that might affect plant operations.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize 20th Century dates beginning with January 1, 2000. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some systems or equipment to malfunction. The nuclear utility industry is engaged in Y2K readiness programs at all nuclear facilities to seek out and correct Y2K problems that have any potential to affect facility operations.

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No. 99-23

February 8, 1999

NRC COMPLETES WORK ON PREPARING ITS INTERNAL COMPUTER SYSTEMS FOR YEAR 2000 READINESS

The Nuclear Regulatory Commission (NRC) has completed work on all internal computer systems needed to address the Year 2000 problem. The NRC is one of the first of 24 primary Federal agencies whose progress is being tracked by the Office of Management and Budget to complete its Y2K work.

The NRC has repaired or replaced 88 computer systems, tested them, and certified their readiness to operate beyond the Year 2000. This includes systems developed by the NRC or its contractors to support the agency's operation as well as commercial hardware and software for minicomputers, microcomputers, and other agency applications such as security keycard access to NRC offices.

The highest priority was given to the NRC's seven mission-critical systems, each of which has been certified as Y2K-ready. These include the sealed-source and device nationwide registry, the general license database, the licensing tracking system, the NRC's computer network, the emergency telecommunications system, the operations center information management system, and the emergency response data system. Contingency plans have been verified for these systems in case of any failures, including but not limited to failures related to Y2K.

The NRC's work on Year 2000 readiness, begun in 1996, cost about $10 million.

"Our entire Y2K program to address automated systems internal to NRC was completed well ahead of schedule and under budget," NRC Chairman Shirley Ann Jackson said. "This is attributable to the dedication and spirit of NRC staff and our supporting contractors who used every opportunity to increase efficiency based on lessons learned as our program progressed."

The NRC has fixed all of its mission-critical, business-essential and non-critical systems. Specifically, it has:

- Addressed all mission-critical systems and verified that existing contingency plans for them address any possible system failures (including Y2K-related failures) as well as to cover any business continuity concerns.
- Addressed all non-mission critical systems.
- Resolved all issues related to exchanging data with outside parties.

- Replaced all non-compliant hardware as needed to address the embedded chip problem.
- Tested all telecommunications equipment and replaced non-Y2K compliant components as needed. All NRC telecommunications service providers have stated that they will be Y2K compliant by mid-year.
- Verified that the Y2K problem will not affect systems related to the operation and maintenance of agency buildings.

As an independent verification of the agency's Y2K program effectiveness and accuracy, the NRC Office of Inspector General has conducted ongoing reviews and reported that the agency's Y2K management program was thorough and effective.

Additional information on NRC's Y2K activities is available on its website at http://www.nrc.gov/NRC/NEWS/year2000.

The agency is also working with nuclear power plant and other licensees to ensure Y2K readiness for those systems needed to operate and shut down plants safely, recognizing the importance of electrical grid reliability and to ensure security of radioactive materials.

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No. 99-21

February 5, 1999

NRC TO HOLD BRIEFING ON YEAR 2000 ISSUES

The Nuclear Regulatory Commission has scheduled a briefing on Year 2000 issues on Thursday, February 11, at 9:00 a.m. in the Commissioners' Conference Room.

The NRC is located at 11555 Rockville Pike in Rockville, Maryland, directly across from the White Flint Metro stop on the Red Line. The meeting, expected to last about 90 minutes, will be open to the public and media.

John Koskinen, Chair of the President's Council on Year 2000 Conversion, will provide an overview of the Federal government's Year 2000 problems. Frank Miraglia, the NRC's Deputy Executive Director for Regulatory Effectiveness, will provide the Commission with a status report on agency Y2K activities with regard to regulation of its licensees. Jim Davis of the Nuclear Energy Institute, will discuss the industry's activities to prepare nuclear power plants for the Year 2000 computer problem.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some systems or equipment to malfunction.

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No. 99-10

January 21, 1999

NRC REQUESTS INFORMATION FROM NUCLEAR POWER PLANT LICENSEES

ABOUT OVERALL YEAR 2000 READINESS

The Nuclear Regulatory Commission has requested all utilities operating nuclear power plants to inform NRC of steps they are taking to ensure their power plants will be able to function after January 1, 2000, to maintain stability of the national electric power grid.

The request for information is broader in scope than previous requests for information. The new request includes systems necessary for continued plant operation which are not covered by the terms and conditions of the plant's license and NRC regulations. Consequently, this information does not require submittal under oath or affirmation. Utilities have a choice whether they report by July 1 on their plants' Y2K readiness for systems within their license and NRC regulations or all those systems required for continued operation.

The "Year 2000" or Y2K problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some systems or equipment to malfunction.

Earlier this year, NRC notified all utilities to provide detailed information on steps they are taking to deal with the Year 2000 computer problem in order to ensure that key computer systems will continue to function properly after January 1, 2000. Since that time, however, increased public awareness and government attention to the Year 2000 problem have resulted in concern over not only public health and safety of nuclear power plants, but also over their ability to continue to provide power.

In September, the NRC started conducting Year 2000 audits at 12 nuclear power plants. These audits, which will be completed by the end of this month, evaluate the effectiveness of measures licensees are taking to identify and correct Y2K problems at their facilities. Audit results will be used to determine if NRC needs to take further regulatory action and will be made available on the NRC web page as they are issued. Results of the first six audits have been posted.

The text of the letter sent to all utilities operating nuclear power plants will be posted on the NRC Internet web page at: http://www.nrc.gov/NRC/NEWS/year2000. This site has additional information

relating to steps NRC is taking to deal with the Year 2000 problem.

Nuclear Regulatory Commission

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No. 98-219

December 8, 1998

NRC MAKES AVAILABLE STAFF DRAFT

YEAR 2000 CONTINGENCY PLAN

The Nuclear Regulatory Commission is making available a draft "Contingency Plan for the Year 2000 Issue in the Nuclear Industry."

The NRC is working with its licensees to ensure that their potential Year 2000 (Y2K) issues have been identified and corrected and that the agency's own computer-based systems will continue to function properly during the transition from 1999 into 2000.

Nuclear power plant licensees indicate no significant Year 2000 problems with computer systems required for safe operation or shutdown of plants, since most are controlled by analog equipment that does not use computers. However, other non-safety computer systems used in such areas as control room displays, radiation monitoring and security functions may have potential problems. For this reason, the NRC is developing a contingency plan for ensuring that public health and safety and the environment will continue to be protected, even if unforeseen Y2K problems occur.

The draft plan, built around a reasonably conservative planning scenario, would establish NRC expectations for staff coordination with external stakeholders and staff actions to be taken beginning December 31, 1999.

The plan was developed by an NRC task force made up of seven agency employees and chaired by Joseph G. Giitter, Office for Evaluation and Analysis of Operational Data. The Commission is currently reviewing the draft.

A copy of the draft contingency plan is available for review in the NRC Public Document Room, 2120 L Street, N.W., Washington, D.C. 20555, and electronically on the NRC's Internet web page at http://www.nrc.gov/NRC/Y2K/Y2KCP.html. A copy may also be ordered from Joseph G. Giitter, U.S. Nuclear Regulatory Commission, Office for Evaluation and Analysis of Operational Data, Washington, D.C. 20555; telephone: 301/415-7485.

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No. 98-191

October 22, 1998

NRC STATUS REPORT ON EFFORTS TO HEAD OFF COMPUTER PROBLEMS

IN YEAR 2000

The Nuclear Regulatory Commission, in conjunction with the designation by a Presidential Council this week as "National Year 2000 Action Week," recognizes the importance of solving the Year 2000 (Y2K) computer problem and offers the following status report on its comprehensive program for dealing with it.

The NRC supports the President's Council on Year 2000 Conversion, participating in those groups dealing with energy/electric power, health care and emergency management.

There are two aspects of the NRC's Y2K program: one addresses the agency's computer systems; another addresses those licensed by the NRC to use nuclear materials.

An inventory of all NRC automated information systems identified seven mission-critical computer systems subject to Year 2000 problems. Three of these systems have been repaired or replaced, one more will be made Y2K compliant by the end of this month, and the remaining three are on schedule to be fixed by March of next year.

The NRC has been working with its licensees to prepare their facilities for the Y2K problem. Nuclear power plant licensees indicate no significant Year 2000 problems with computer systems required for safe operation or shut down of plants since most are controlled by analog equipment which does not use computers. However, other non-safety computer systems used in such areas as control room displays, radiation monitoring and security functions have potential problems which licensees have informed the NRC they intend to make them Y2K compliant by next July 1.

The NRC has completed three of 12 audits at nuclear plants to evaluate the effectiveness of licensees in identifying and correcting Year 2000 problems. So far, results have not shown the need for further NRC regulatory action.

In response to a request from NRC (Generic Letter 98-03), fuel cycle licensees and certificate holders of gaseous diffusion plants have indicated they all have programs to address Year 2000 problems. The NRC has put out notices and discussed the Y2K problem with other licensees using nuclear materials in industry, medicine, and research to ensure that the problem will be either eliminated or minimized.

The NRC also is developing a contingency plan to react promptly to any unanticipated Y2K problems that might arise at licensed facilities. The plan will be coordinated with other Federal agencies, States, the nuclear industry, and international regulatory organizations.

In addition, the NRC recently spearheaded an initiative at the 128-member International Atomic Energy Agency (IAEA) to develop a resolution making the IAEA a clearinghouse for international information on efforts to identify and correct potential safety-related Y2K problems at nuclear installations. The resolution also calls upon nuclear power countries to promptly adopt contingency plans to deal with unexpected Y2K problems.

The "Year 2000" problem refers to a computer's inability to recognize 21st century dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" a 1900, rather than 2000, possibly causing some plant systems or equipment to malfunction.

Additional information on Y2K activities is available on NRC's web site at: http://www.nrc.gov/NRC/NEWS/year2000.html.

Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

Telephone: 301/415-8200 -- E-mail: opa@nrc.gov

No. 98-172

September 21, 1998

NRC AUDITING NUCLEAR POWER PLANT YEAR 2000 READINESS PROGRAMS

As part of its efforts to address the Year 2000 problem, the Nuclear Regulatory Commission has begun a series of audits that will examine 12 nuclear power plants throughout the nation to spot-check measures licensees are taking to assure that key computer systems will function in the year 2000 and beyond.

The process, which will extend through January, started this month with audits at the Monticello nuclear power plant in Minnesota and the Seabrook plant in New Hampshire. Other plants will be audited as follows:

October: Brunswick (North Carolina), Hope Creek (New Jersey) and Davis Besse (Ohio).

November: Wolf Creek (Kansas), Watts Bar (Tennessee), and Limerick (Pennsylvania).

December: Waterford (Louisiana).

January: North Anna (Virginia), Braidwood (Illinois), and WNP-2 (Washington State).

Results of the audits will be used to determine if NRC needs to take further regulatory action. Based on preliminary findings during early audits or other relevant emerging information, NRC may need to adjust these schedules and may consider conducting audits at other plants.

The NRC selected plants for the Year 2000 audit based primarily on the following criteria:

-- Three plants located in each of NRC's four regions;

-- Plants designed by all four vendors (Babcock & Wilcox, General Electric, Combustion Engineering, and Westinghouse);

-- Plants of different ages; and

-- Extent of use of computer systems in plants.

The "Year 2000" problem refers to computers' potential inability to recognize dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some plant systems or equipment to malfunction.

Thus far, NRC has no indication that such computer-related problems exist with safety-related systems in nuclear power plants. "Year 2000" problems have been found in non-safety, but nevertheless important computer-based applications, such as security computers, control room display systems, engineering programs, control systems, radiation monitoring, and emergency response.

In January, the NRC issued a letter to all licensed utilities with operational nuclear power plants requiring that they inform the NRC of steps they have taken or will take to deal with the Year 2000 problem. All licensees have responded that they are implementing programs designed to assure that computer systems will operate effectively into the next century. All have indicated they will follow a program similar to the NRC-endorsed industry guide for Year 2000 readiness programs.

By July 1, 1999, licensees must submit a written response confirming that their plants are or will be Year 2000 ready at the turn of the century and if not, must provide a status report, including completion schedules for work remaining to ensure Year 2000 readiness.

A workshop is planned for December with the Nuclear Energy Institute, an industry organization, to share information gathered during the audits and to discuss licensee efforts at addressing the Year 2000 problem.

In addition to regulatory oversight of its licensees with regard to the Year 2000 problem, the NRC supports the activities of the President's Council on Year 2000 Conversion and is a member of the Council's Year 2000 working group dealing with electric power.

More information about the Year 2000 problem can be found at the NRC Internet web page at: http://www.nrc.gov/NRC/NEWS/year2000.html. Details about the NRC audit plan can be found at: http://www.nrc.gov/NRC/Y2k/y2kaudit.html.

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Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

Telephone: 301/415-8200 -- E-mail: opa@nrc.gov

No. 98-106

June 29, 1998

NRC REQUIRES INFORMATION FROM URANIUM PROCESSORS

ABOUT "YEAR 2000" COMPUTER READINESS

The Nuclear Regulatory Commission has notified licensees and certificate holders who process uranium to produce fuel for nuclear power plants that they are required to inform the NRC of steps being taken to ensure their computer systems will function properly by the year 2000 and beyond.

Notifications went to those who operate uranium hexafluoride production plants, uranium enrichment plants and uranium fuel fabrication plants.

By September 21, the companies must submit, in writing, whether they have a program under way to deal with the "Year 2000" computer problem. They must also notify the NRC no later than December 31 as to whether their facility is "Year 2000 Ready." If not, the company must provide a status report of work remaining to be done, including completion schedules. Subsequent responses must be submitted if the situation changes.

"Year 2000 Ready" is defined as a computer system or application that has been determined to be suitable for continued use in the year 2000 and beyond.

The "Year 2000" problem refers to computers' potential inability to recognize dates beginning with January 1, 2000. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some systems or equipment to malfunction.

Examples of systems that may be affected include those for material control and accounting and physical protection, computer security, emergency response, radiation monitoring, and plant process control.

The text of the notification to licensees and certificate holders will be posted on the NRC Internet web page at http://www.nrc.gov/NRC/NEWS/year2000.html.

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Nuclear Regulatory Commission

Office of Public Affairs

Washington DC 20555

Telephone: 301/415-8200 -- E-mail: opa@nrc.gov

No. 98-68

May 12, 1998

NRC REQUIRES INFORMATION FROM NUCLEAR POWER PLANT LICENSEES

ABOUT 'YEAR 2000' READINESS OF COMPUTER SYSTEMS

The Nuclear Regulatory Commission has notified all utilities operating nuclear power plants that they are required to inform NRC of steps they are taking to see that computer systems will function properly by the year 2000.

Within 90 days, licensees must confirm to NRC in writing, under oath or affirmation, they have a program under way to deal with the "Year 2000" computer problem. They are also required to notify NRC no later than July 1, 1999, as to whether their facility is "Year 2000" ready in order to comply with NRC requirements. If facilities are not ready, licensees must provide a status report of work remaining to be done.

The "Year 2000" problem refers to computers' potential inability to recognize 21st Century dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some systems or equipment to malfunction.

NRC continues to have no information thus far indicating that such a problem exists with nuclear power plant safety-related systems. But problems have been found in non-safety, but nevertheless important, computer-based systems. Those which might be affected include security computers, emergency response, control room displays, radiation monitors, engineering programs, inventory control and plant simulators.

In preparing this notification to licensees (known as a generic letter), the NRC staff took into consideration comments received after the letter was published in draft form in January.

The text of the letter will be posted on the NRC Internet web page at http://www.nrc.gov/NRC/NEWS/year2000html. Other related documents posted at this location include NRC advisories to the nuclear industry issued in December 1996 and August 1997, a summary of a meeting between NRC staff and the Nuclear Energy Institute last October, and links to additional Year 2000 resources at NRC and other Federal agencies.

Nuclear Regulatory Commission

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No. 98-16

January 28, 1998

NRC SEEKS INFORMATION ON 'YEAR 2000' READINESS OF NUCLEAR POWER PLANT COMPUTER SYSTEMS; ASKS PUBLIC COMMENT ON PROPOSED LETTER TO LICENSEES

The Nuclear Regulatory Commission staff is proposing to send a letter to all licensed utilities with operational nuclear power plants, requiring that they inform the NRC of steps they have taken or will take to assure their computers have no problems adjusting to the year 2000.

But before issuing the letter, NRC is seeking public comment on its technical and regulatory aspects. NRC proposes to require that all nuclear power plant licensees have effectively addressed the problem by July of 1999.

The "Year 2000" problem refers to computers' potential inability to recognize 21st Century dates beginning with January 1, 2000, and beyond. It is caused by computer programs that use two-digit numbers to represent a calendar year (such as "98" for 1998). If the problem is not corrected, vulnerable computer systems will read "00" as 1900, rather than 2000, possibly causing some plant systems or equipment to malfunction.

Thus far, NRC has no information that such computer-related problems exist with safety-related systems in nuclear power plants. But "Year 2000" problems have been found in non-safety, but nevertheless important, computer-based applications such as security computers, control room display systems, inventory control, engineering programs, control systems, radiation monitoring, and emergency response.

The proposed letter to nuclear power plant licensees would require a response, under oath or affirmation, no later than July 1, 1999, confirming that their facility computer systems are suitable for use at least into the year 2000 and that the plant complies with its license and NRC regulations. Also required would be a status report of work remaining to make computer systems fully operational in the new century.

Written comments on the letter should be sent to Chief, Rules and Directives Branch, Division of Administrative Services, U.S. Nuclear Regulatory Commission, Mail Stop T6-D69, Washington, DC 20555-0001. They also may be delivered to 11545 Rockville Pike, Rockville, Maryland, between 7:45 a.m. and 4:15 p.m. on Federal workdays.

More details, including the text of the proposed letter, are in a notice to be published shortly in the Federal Register. The notice is also available at the NRC Public Document Room, 2120 L Street, N.W.

(Lower Level), Washington, DC.

The notice also will be posted on the NRC Internet web page at http://www.nrc.gov/NRC/NEWS/year2000.html. This web page already contains a number of other documents issued earlier relating to the Year 2000 problem, including NRC advisories to the industry published in December 1996 and August 1997, as well as a summary of a meeting NRC staff had with the Nuclear Energy Institute last October.

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Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for November 1999

I. Mission Critical Systems.

Total Number of Mission-Critical Systems	Number Compliant	Number To Be Replaced	Number To Be Repaired	Number To Be Retired
7	7	0	0	0

II. Other Progress

A. Non-Mission-Critical Systems

Our total number of non-mission-critical systems is 103. All NRC non-mission-critical systems were renovated, validated, and implemented in our production environment as of February 5, 1999.

B. Data Exchanges

After assessing all areas of the agency that have the potential of exchanging data with other Federal, State, and local governments, as well as with international and commercial entities, we identified three systems with which we exchange data. Two of these systems exchange data with one source, and one system exchanges data with six sources.

Discussions with NRC data exchange partners reveal that two exchanges are already Year 2000 (Y2K) compliant and five exchanges do not require NRC to make any changes. The final data exchange is contained in one of NRC's mission-critical systems. This system has been renovated, validated, and implemented. All of our work in this area has been completed.

C. Telecommunications Systems

NRC sent letters to its various telecommunications equipment vendors nationwide in order to determine their progress in addressing the Y2K problem as it relates to their products. All of the vendors have responded, been contacted by telephone, or had their Internet site accessed to determine the status of their progress.

We have performed the work necessary to ensure that 100 percent of our telecommunications infrastructure is compliant or is not affected by Y2K issues.

We have also contacted our telecommunications service providers to ascertain that they have plans to achieve Y2K compliance. All of our service providers have responded that they are Y2K compliant.

D. Buildings and Related Systems

We assessed all agency building systems and determined that four building system categories could be

affected by Y2K issues: environmental, fire protection, security access control and alarms, and elevator.

We contacted the vendors for these systems and received written responses from them. As of February 5, 1999, we have determined that continued safe operation of systems in these four categories will not be affected by the Y2K date rollover.

E. Embedded Chip Systems

We have identified and analyzed all known embedded chip systems at the NRC and have replaced all noncompliant embedded chip hardware as necessary to address the Y2K problem.

F. Any Additional Information

No other information is offered.

III. Federally Supported, State-Run Programs

In February 1998, NRC sent information to the Agreement States (ASs) to increase their awareness of the Y2K problem. Information was sent on the nature and scope of potential problems for materials licensees and the actions NRC was taking to encourage NRC materials licensees to examine their computer systems and software. NRC recommended that the ASs encourage their licensees to conduct similar examinations. NRC also asked the ASs to share information with NRC on any Y2K problems identified by AS licensees that could affect NRC, other ASs, or their licensees.

To help facilitate AS efforts to address potential Y2K problems, NRC established a link to NRC Y2K information at the Office of State Programs Web site. NRC also informed the ASs about the availability of the NRC's list server that e-mails the latest Y2K information to each subscriber.

During the past 21 months, the Chair of the Management Review Board has also questioned AS managers about their State's Y2K activities. The AS managers have indicated that Y2K issues in their programs are being addressed as a part of statewide efforts. At this time, NRC is not aware of any Y2K issues affecting materials licensees identified by ASs.

IV.High-Impact Programs

NRC has no programs in this category.

V. Change Management and Verification Efforts

Although NRC has always practiced change management on an informal basis, we formalized our change management process in 1996 with the issuance of NRC's Systems Development and Life Cycle Management (SDLCM) methodology. Recognizing that any proposed change, if not properly managed, has the potential to cause system failures, NRC's SDLCM provides for a 10-step change control process that, among other tasks, provides for change research, problem analysis, and impact analysis. Complete documentation resulting from this change control process is reviewed and approved by a configuration control board before any work is begun. We believe that this formal process will prevent any adverse effect on previously implemented Y2K repairs.

Systems repaired by Y2K program contractors were independently verified and validated by a three-level approach. The first level, unit testing, was performed by contract personnel who actually repaired the system code. The second and third levels were performed by personnel who were not involved with

system repairs. The second level of testing was performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing was performed by the NRC personnel who use the system, also using an established test plan. We consider the systems validated only after we receive written approval from all three testing levels. We retain all annotated test plans in our Y2K files, along with all written approvals.

Systems repaired by NRC program offices (and their contractors) underwent a comparable validation process. We reported these systems as validated only when the Senior Executive Service director of the responsible office certified validation in writing.

All repaired and replaced systems have been successfully operating in our production environment since February 5, 1999.

VI. Regulatory Review

A review of proposed regulatory requirements is performed by NRC's Committee To Review Generic Requirements (CRGR). The CRGR has been instructed to consider the impact of proposed requirements on Y2K efforts of licensees.

VII. Business Continuity and Contingency Plans

Computer systems supporting NRC's regional offices are centrally supported at NRC's Headquarters and are covered in NRC's Business Continuity and Contingency Plan (BCCP) prepared and first submitted to the Office of Management and Budget (OMB) on June 18, 1999. An updated BCCP was requested by OMB on October 13, 1999, and we submitted our updated plan to OMB on October 19, 1999. The emergency response aspects of this plan were tested most recently on October 15, 1999, when NRC conducted a full-scale Y2K exercise, which included participation by 11 nuclear licensees.

Presidential Decision Directive 67 (PDD 67), issued October 21, 1998, relates to enduring constitutional government, continuity of operations (COOP) planning, and continuity of government (COG) operations. In response to this directive, the NRC formed a task force of representatives from throughout the agency who are familiar with agency contingency plans. The task force developed the COOP as a unifying concept that does not replace existing plans but, instead, superimposes COOP functions if and when a problem threatens serious disruption to NRC operations.

The NRC COOP identifies agency emergency response as the primary function necessary to ensure adequate protection of public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States. The plan further identifies those requirements necessary to support the primary function, such as emergency communications, establishing a chain of command, and delegation of authority. NRC has coordinated and continues to coordinate the various contingency plans, such as NRC's Contingency Plan for the Year 2000 Issue in the Nuclear Industry, at working-group levels. For example, Y2K planning concerns a specific threat at a predictable time, so details of the Y2K plan and the COOP differ, but the agency's responses will be consistent.

NRC's COOP was approved by the Commission and implemented on by October 21, 1999.

VIII. Other Management Information

A. Costs (In millions)

Fiscal Year	1996	1997	1998	1999	2000	Total
Current Cost	0.0*	2.4	4.0	1.9	0.1	8.4

* - Item is $45,000.

B. Costs Not Covered in Base or Emergency Funds.

All costs were covered in original agency base estimates.

C. Explain Dramatic Changes in Cost.

No changes have occurred since the last report.

D. Key Personnel

No concerns exist about the availability of key personnel.

E. Other Problems

No problems affecting progress exist.

If you have any questions about this report, please contact Arnold E. (Moe) Levin at 301-415-7458, or by e-mail at ael1@nrc.gov.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for August 1999

I. Mission Critical Systems.

Total Number of Mission-Critical Systems	Number Compliant	Number To Be Replaced	Number To Be Repaired	Number To Be Retired
7	7	0	0	0

II. Other Progress

A. Non-Mission-Critical Systems

All NRC business-essential and non-critical systems have been renovated, validated, and implemented in our production environment as of February 5, 1999.

B. Data Exchanges

After assessing all areas of the agency that have the potential of exchanging data with other Federal, State, and local governments, as well as with international and commercial entities, we identified three systems with which we exchange data. Two of these systems exchange data with one source, and one system exchanges data with six sources.

Discussions with NRC data exchange partners reveal that two exchanges are already Year 2000 (Y2K) compliant and five exchanges do not require NRC to make any changes. The final data exchange is contained in one of NRC's mission-critical systems. This system has been renovated, validated, and implemented. All of our work in this area has been completed.

C. Telecommunications Systems

NRC sent letters to its various telecommunications equipment vendors nationwide in order to determine their progress in addressing the Y2K problem as it relates to their products. All of the vendors have responded, been contacted by telephone, or had their Internet site accessed to determine the status of their progress.

We have performed the work necessary to ensure that 100 percent of our telecommunications infrastructure is compliant or is not affected by Y2K issues.

We have also contacted our telecommunications service providers to ascertain that they have plans to achieve Y2K compliance. All of our service providers have responded that they are Y2K compliant.

D. Buildings and Related Systems

We assessed all agency building systems and determined that four building system categories could be

affected by Y2K issues: environmental, fire protection, security access control and alarms, and elevator.

We contacted the vendors for these systems, and received written responses from them. As of February 5, 1999, we have determined that continued safe operation of systems in these four categories will not be affected by the Y2K date rollover.

E. Embedded Chip Systems

We have identified and analyzed all known embedded chip systems at the NRC and have replaced all non-compliant embedded chip hardware as necessary to address the Y2K problem.

F. Any Additional Information

No other information is offered.

III. Federally Supported, State-Run Programs.

In February 1998, NRC sent information to the Agreement States (AS) to increase their awareness of the Y2K problem. Information was sent on the nature and scope of potential problems for materials licensees and the actions NRC was taking to encourage NRC materials licensees to examine their computer systems and software. NRC recommended that the AS encourage their licensees to conduct similar examinations. NRC also asked the AS to share information with NRC on any Y2K problems identified by AS licensees that could affect NRC, other AS, or their licensees.

To help facilitate AS efforts to address potential Y2K problems, NRC established a link to NRC Y2K information at the Office of State Programs Web site. NRC also informed the AS about the availability of the NRC's list server that e-mails the latest Y2K information to each subscriber.

During the past 18 months, the Chair of the Management Review Board has also questioned AS managers about their State's Y2K activities. The AS managers have indicated that Y2K issues in their programs are being addressed as a part of statewide efforts. At this time, NRC is not aware of any Y2K issues affecting materials licensees identified by AS.

IV. High Impact Programs

NRC has no programs in this category.

V. Change Management and Verification Efforts.

Although NRC has always practiced change management on an informal basis, we formalized our change management process in 1996 with the issuance of NRC's Systems Development and Life Cycle Management (SDLCM) methodology. Recognizing that any proposed change, if not properly managed, has the potential to cause system failures, NRC's SDLCM provides for a 10-step change control process that, among other tasks, provides for change research, problem analysis, and impact

analysis. Complete documentation resulting from this change control process is reviewed and approved by a configuration control board before any work is begun. We believe that this formal process will prevent any adverse effect on previously implemented Y2K repairs.

Systems repaired by Y2K program contractors were independently verified and validated by a three-level approach. The first level, unit testing, was performed by contract personnel who actually repaired the

system code. The second and third levels were performed by personnel who were not involved with system repairs. The second level of testing was performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing was performed by the NRC personnel who use the system, also using an established test plan. We consider the systems validated only after we receive written approval from all three testing levels. We retain all annotated test plans in our Y2K files, along with all written approvals.

Systems repaired by NRC program offices (and their contractors) underwent a comparable validation process. We reported these systems as validated only when the Senior Executive Service director of the responsible office certified validation in writing.

All repaired and replaced systems have been successfully operating in our production environment since February 5, 1999.

VI. Regulatory Review

A review of proposed regulatory requirements is performed by NRC's Committee to Review Generic Requirements (CRGR). CRGR has been instructed to consider the impact of proposed requirements on Y2K efforts of licensees.

VII. Business Continuity and Contingency Plans.

Computer systems supporting NRC's regional offices are centrally supported at NRC's Headquarters and are covered in NRC's Business Continuity and Contingency Plan (BCCP) prepared and submitted to the Office of Management and Budget (OMB) on June 18, 1999. The emergency response aspects of this plan were tested most recently on July 14, 1999, when NRC conducted a Y2K training and tabletop exercise with State, county, Federal, and utility partners.

This training and tabletop exercise was intended to test the plans developed by the various partners for this unique situation to ensure that the plans are coordinated and consistent. The generic lessons learned from this tabletop exercise will be posted on our Y2K Web site so that they may be shared with other States, utilities, and local governments. The NRC also hopes to use this and future exercises as an opportunity to identify any omissions or weaknesses in its own Y2K contingency plan and implementing procedures. Additional NRC Y2K exercises are planned for the September-October 1999 time frame.

Presidential Decision Directive 67 (PDD 67), issued October 21, 1998, relates to enduring constitutional government, continuity of operations (COOP) planning, and continuity of government (COG) operations. In response to this directive, the NRC formed a task force consisting of representatives from throughout the agency to develop agency plans for continuity of operations. To date, the task force has defined priority groups of functions, representative potential disruptions of normal operations, and a principal alternate location that will provide the basis for the draft NRC COOP. An initial version of the plan is scheduled for the Commission's review in early October 1999, and final implementation of the COOP is to take place by October 21, 1999. With the Commission's consent, the plan will provide an initial capability for continuity of minimal essential NRC functions and for restoration of normal business functions, as required in PDD 67.

The NRC COOP identifies agency emergency response as the primary function necessary to ensure adequate protection of the public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States. The plan further identifies those

requirements necessary to support the primary function, such as emergency communications, establishing chain of command, and delegation of authority. NRC has coordinated and continues to coordinate the various contingency plans, such as NRC's Contingency Plan for the Year 2000 Issue in the Nuclear Industry, at working-group levels. For example, Y2K planning concerns a specific threat at a predictable time, so details of the Y2K plan and the COOP differ, but the agency's responses will be consistent.

VIII. Other Management Information.

A. Costs (In millions)

Fiscal Year	1996	1997	1998	1999	2000	Total
Current Cost	0.0*	2.4	4.0	1.9	0.1	8.4

* - Item is $45,000.

B. Costs not covered in base or emergency funds.

All costs were covered in original agency base estimates.

C. Explain dramatic changes in cost.

The final cost of NRC's Y2K program was $2.5 million less than original budget estimates. This difference was mainly due to end-user decisions to retire 55 systems that were initially scheduled for repair. Another contributing factor was that we finished the repair of all of our systems within a relatively short period. This accomplishment allowed our contractors to take advantage of efficiencies resulting from a stable work force that was able to become familiar with the general nature of our systems and to build on what they had learned with each system repair. We estimate that we saved $2.6 million, however, guidance for this report requires that we add $100,000 to Fiscal Year 2000 to represent the cost associated with BCCP implementation activities. These activities consist of staff hours that will be expended regardless of how Y2K affects the agency, primarily in increased staffing levels in our emergency operations facilities.

D. Key Personnel.

No concerns exist about the availability of key personnel.

E. Other Problems

No problems affecting progress exist.

If you have any questions about this report, please contact Arnold E. (Moe) Levin at 301-415-7458, or by e-mail at AEL1@NRC.gov.

Status of the Nuclear Regulatory Commission's Year 2000 Efforts

Quarterly Report for May 1999

I. **Overall Progress.** Provide a report of the status of agency efforts to address the Year 2000 problem, which includes an agency-wide status of the total number of mission-critical systems.

Total Number of Mission-Critical Systems	Number Compliant	Number To Be Replaced	Number To Be Repaired	Number To Be Retired
7	7	0	0	0

II. **Progress of Systems Under Repair.** Provide a report of the status of agency efforts to address the Year 2000 problem, which includes the status of systems under repair.

a. **Status of mission-critical systems being repaired.**

	Number of Mission Critical Systems	Assessment	Renovation	Validation	Implementation
Milestones		Sep 1997	Sep 1998	Jan 1999	Mar 1999*
Current Number Complete	4	4	4	4	4

b. **Provide a description of progress for fixing or replacing mission-critical systems.**
All of our mission-critical systems have been renovated, validated, and implemented in our production environments as of February 5, 1999.

c. **Provide a description of progress in fixing non-mission-critical systems.**
Our non-mission-critical systems are assigned to one of two categories in order to make explicit decisions about establishing their priority for repair:

Business-Essential Systems: Any system that is integral to agency processes that are required for meeting agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while being repaired.

Non-Critical Systems: Any system that is not mission-critical or business-essential; unavailability would therefore represent only an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired, and manual processes can be readily used in their place, if necessary.

All of our business-essential and non-critical systems have been renovated, validated, and implemented in our production environment as of February 5, 1999.

d. **Provide a description of the status of efforts to inventory all data exchanges with outside entities.**

We have assessed all areas of the agency that have the potential to exchange data with other Federal, State, and local governments, as well as with international and commercial entities. Three systems were identified that exchange data with NRC. Two of these systems exchange data with one source, and one system exchanges data with six sources.

Discussions with NRC data exchange partners reveal that two exchanges are already Year 2000 (Y2K) compliant and five exchanges do not require NRC to make any changes. The final data exchange is contained in one of NRC's mission-critical systems. This system has been renovated, validated, and implemented. All our work in this area has been completed.

e. **Provide a description of efforts to address the Year 2000 problem in other areas.**

(i) Power Reactors

As discussed in previous quarterly reports, the NRC issued Generic Letter (GL) 98-01 to licensees of all operating reactors on May 11, 1998. This generic letter was sent to gain assurance that licensees are effectively addressing the Y2K problem at their facilities.

NRC has received all the initial responses from its power reactor licensees. All responses state that the licensee has pursued, and is continuing to pursue, a Y2K readiness program similar to the one outlined in NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," augmented appropriately in the area of risk management, contingency planning, and remediation of embedded systems. NEI/NUSMG 97-07 recommends methods for utilities to attain Y2K readiness and thereby ensure that their facilities remain safe and continue to operate within the requirements of their license.

The Nuclear Energy Institute (NEI), in collaboration with Nuclear Utilities Software Management Group (NUSMG), issued a new guidance document, NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," in August 1998, which incorporates guidance in the areas of contingency planning, business continuity, and risk management. NRC reviewed NEI/NUSMG 98-07 and finds that it provides good guidance for augmenting Y2K readiness program in the area of contingency planning. It is expected that all nuclear power plant licensees will incorporate NEI/NUSMG 98-07 into their Y2K readiness programs.

In September 1998, the NRC began conducting Y2K readiness sample audits at 12 nuclear power plants. These audits evaluate the effectiveness of those measures licensees are taking to identify and correct Y2K problems at their facilities. Audit reports are

The audits focused, first, on those areas of the Y2K readiness program affecting plant safety, followed by those areas important to safety (including continued plant operation). Licensee contingency planning was also reviewed during the audits. Audit findings have confirmed that licensees are implementing effective Y2K readiness programs and are on schedule to achieve readiness in accordance with GL 98-01 guidance. Audit results have not indicated a need for further NRC regulatory action, and we have no indication that significant Y2K problems exist with safety-related systems that could directly affect the ability of nuclear power plants to safely operate and shut down.

In December 1998, the NRC participated in the NEI-sponsored Y2K readiness workshop in Atlanta, Georgia at which the NRC exchanged information with nuclear power industry licensee representatives, including the results of audits completed to date. Other topics discussed at the workshop included contingency planning and system remediation methods.

In January 1999, the NRC issued a supplement to GL 98-01 that provides nuclear power plant licensees with a voluntary alternative response to the second response required by GL 98-01. This alternative response, which is also due by July 1, 1999, will provide the overall Y2K readiness status of the nuclear power plant rather than just those aspects pertaining to the terms and conditions of the license and NRC regulations. This alternative is consistent with the Year 2000 Information and Readiness Disclosure Act (Public Law No. 105-271) enacted in October 1998.

Each licensee will provide confirmation of Y2K readiness and compliance with its license with respect to the Y2K problem in July 1999 when the second response to GL

(ii) Fuel Cycle Facilities and Materials Licensee

Since November 17, 1997, materials and fuel cycle inspectors have been instructed to confirm receipt of NRC's information notices by materials and fuel cycle licensees and certificate holders; to determine whether the licensees and certificate holders have identified any potential problems associated with the Y2K issue; and to note any corrective actions taken by the licensees and certificate holders. Generic Y2K information received from inspectors will be passed on to NRC licensees. To date, no generic Y2K issues have been identified.

In June 1998, in order to gain the necessary assurance that fuel cycle licensees and certificate holders are effectively resolving the Y2K problem, the NRC issued GL 98-03. Similar to the generic letter for power reactors, GL 98-03 requires fuel cycle licensees and certificate holders to provide written information concerning the implementation of the Year 2000 Readiness Program and confirmation that facilities are Y2K ready.

All nine fuel cycle licensees and certificate holders responded to the first requirement of GL 98-03 and reported that they have established a Year 2000 Readiness Program. Six have stated that they will be Y2K ready by July 1999. Two of the licensees reported that they will be Y2K ready by October 1999. One licensee reported that it will be Y2K ready by December 1999.

On August 12, 1998, a third information notice (IN 98-30) pertaining to the Y2K computer problem was sent to material and fuel cycle licensees and certificate holders, reminding them of the Y2K problem and discussing how the Y2K problem could affect their operation.

In support of the President's Council on Year 2000 Conversion, NRC has participated in and

provided information to the health care sector and the environmental protection

(iii) Contingency Planning

The NRC has developed a draft Contingency Plan that will be used to deal with unforeseen Y2K problems that may affect NRC-licensed facilities. This plan has been placed on the NRC's external Y2K Web site (http://www.nrc.gov/NRC/NEWS/year20 00.html) to facilitate external stakeholder coordination and to solicit input. After external stakeholder input has been incorporated into the plan, it will be submitted to the Commission for formal approval. The NRC is also actively participating in several interagency working groups that are planning for Y2K contingencies. These groups include the Catastrophic Disaster Response Group and the President's Council Y2K Emergency Services Sector working group. The NRC plans to conduct exercises in preparation for potential Y2K problems. We anticipate that at least one of the exercise scenarios will simulate failure of mission-critical systems that support NRC's incident response capability and require implementation of NRC contingency plans for those systems.

Embedded Chips

We have analyzed and identified embedded chip systems at the NRC. Forward date testing of some embedded chip systems is problematic since access is limited to embedded chip system control programs. As a result, both the nuclear industry and the NRC rely on the manufacturer's certification to establish compliance and, where possible and appropriate, in-house testing to confirm compliance.

In the area of microcomputers and laser printers, we have successfully tested our hardware with available testing software to determine compliance. NRC has resolved all issues related to embedded systems and has replaced all microcomputers that have non-compliant chips.

In the area of local area and wide area network computer components, one of our mission-critical systems being replaced covers all of this infrastructure. We previously reported herein that this mission-critical system is now 100-percent complete.

f. **Provide a description of efforts to address the Year 2000 problem for agency buildings.**

All agency building systems were assessed. We determined that there are four building system categories that could have Y2K issues: environmental, fire protection, security access control and alarms, and elevator.

Vendors for these systems were contacted, and we received written responses from them. As of the date of this report, we have determined that continued safe operation of systems in the four categories mentioned above will not be affected by the Year 2000 date rollover.

g. **Provide a description of efforts to address the Year 2000 problem in your telecommunications systems.**

Telecommunications Equipment

NRC sent letters to its various telecommunications equipment vendors nationwide in order to determine their progress in addressing the Year 2000 problem as it relates to their products. All of the vendors have responded, been contacted by telephone, or had their Internet site accessed to determine status.

We have performed the work necessary to ensure that 100 percent of our telecommunications infrastructure is compliant or is not affected by Y2K issues.

We have also contacted our telecommunications service providers to determine their plans to achieve Y2K compliance. All of our service providers have responded that they are compliant or will be compliant by mid-1999.

h. **Provide a description of the status of the Year 2000 readiness of each government-wide system operated by the agency.**
NRC has no systems in this category.

i. **Other information demonstrating agency progress.**
No other information is offered.

j. **Efforts to ensure that Federally supported, State-run programs will be able to provide services and benefits.**
In February 1998, NRC provided information to the Agreement States (AS) to increase their awareness of the Y2K problem. Information was provided on the nature and scope of potential problems for materials licensees and the actions NRC was taking to encourage NRC materials licensees to examine their computer systems and software. NRC recommended AS encourage their licensees to conduct similar examinations. NRC also asked AS to share information with NRC on any Y2K problems identified by AS licensees that could impact NRC, other AS, or their licensees. To help facilitate AS efforts in addressing potential Y2K problems, NRC established a link to NRC Y2K information at the Office of State Programs web site. NRC also informed the AS about the availability of the NRC's list server that e-mails the latest Y2K information to each subscriber.

During the past 18 months, the Chair of the Management Review Board has also questioned AS managers about their State's Y2K activities. The AS managers have indicated that Y2K issues in their programs are being addressed as a part of statewide efforts. At this time, NRC is not aware of any Y2K issues, affecting materials licensees, identified in AS.

III. **Verification Efforts.**

Describe your independent validation and verification program.
Systems repaired by Y2K program contractors were independently verified and validated by a three-level approach. The first level, unit testing, was performed by contract personnel who actually repaired the system code. The second and third levels were performed by personnel who were not involved with system repairs. The second level of testing was performed by contractor personnel assigned to a permanent quality assurance group, using an established test plan. Third-level testing was performed by the NRC personnel who use the system, also using an established test plan. Only when written approval was received from all three testing levels did we consider the system validated. All annotated test plans are retained in our Y2K files, along with all written approvals.

Systems repaired by NRC program offices (and their contractors) underwent a comparable validation process. We reported these systems as validated only when the Senior Executive Service director of the responsible office certified validation in writing.

IV. **Organizational Responsibilities.**

There is no change from the previous report.

V. **Business Continuity and Contingency Plans.**

Describe your agency's approach and progress to ensure continuity of your core business functions.

NRC has an established program that predates the Y2K program and that develops, maintains, and updates the agency's business continuity plans in accordance with Federal guidance, including Office of Management and Budget (OMB) Circular A-130, Appendix III, "Security of Federal Automated Information Resources." The objective of this program is to ensure that appropriate business continuity plans are put in place for all of the NRC's general purpose systems and major applications, which include the mission-critical applications identified in our Y2K program. The process of developing the plans entails several steps:

- Conduct a business impact analysis and risk assessment.
- Develop a security plan.
- Test the security plan.
- Certify and accredit the system.
- Develop a disaster and business continuity plan.
- Train personnel and test the disaster and business continuity plan.

The Office of the Chief Information Officer uses contractor resources obtained through the General Services Administration's multiple award contract for computer security services to assist with its efforts in this area, including the conduct of facilitated risk assessments and development of plans.

By their nature, business continuity plans cover a wide range of possible events, ranging from software and hardware problems to major natural disasters. These plans also take a significant amount of time to prepare in their entirety.

Because of the immediacy of the Y2K problem, NRC has made a special effort to ensure that the contingency business continuity plans for its mission-critical systems specifically address failures resulting from the Y2K problem.

NRC's seven mission-critical systems support three core functions. One system supports the interchange of information agencywide and is our administrative local area network. Three systems support our response capability in the event of a nuclear emergency and reside in our Emergency Operations Center. The remaining three systems support the tracking and inspection of nuclear materials.

These three groups of systems are independent of each other and have no complex interrelationships with any other systems except for dependencies on the U.S. telecommunications infrastructure.

Only one of our mission-critical systems relies on electronic data provided by other automated systems, so failures of external or internal automated systems will not affect our mission-critical

systems. This mission-critical system is one of the three in our Emergency Operations Center. It receives real-time data from nuclear reactor sites in the event of a declared emergency. The Center has its own backup generator to provide power to its electronic components in the event of a power outage, as well as contingency plans dealing with the loss of any of its electronic, telecommunications, or computerized functions.

In all cases, our mission-critical systems are non-complex, stand-alone systems that support a separate area within one of our three core functions. Compared to large, complex applications dealing with millions of records and complex real-time processes, NRC's mission-critical systems are relatively simple and deal with a volume of information that is small enough to manage by manual means, if necessary, or if automation is temporarily unavailable.

Our contingency plans are commensurate with the nature of our mission-critical systems and have been prepared by the functional area business people. In all but one case, these plans have an option that assumes total automation unavailability, thus requiring that we revert to manual methods to continue support of the mission-critical functional area. These manual methods have been successfully used by our business people in the past when their systems did not exist or were temporarily unavailable. The case previously mentioned that does not assume total automation unavailability is associated with our administrative local area network (LAN). This network supports our e-mail function, common document storage, and makes administrative software (word processing, etc.) available through the LAN. However, administrative software is also present as a contingent redundancy on each workstation, so if the LAN were unavailable, necessary documents in progress can be rekeyed to continue work. New documents can be created, stored locally, and shared by floppy disk. Since the network has significant redundancy, complete unavailability of the LAN for any protracted length of time is considered very unlikely.

Our business-area people prepared these plans to ensure that we will continue to conduct mission-critical business in the event of any system failures.

VI. **Exception Report on Systems.**

There are no exceptions to report.

VII. **Systems Scheduled for Implementation After March 1999. Include a list of those mission-critical systems where repair or replacement cannot be implemented by the March 1999 deadline.**

All mission-critical systems have been implemented.

VIII. **Other Management Information.**

a. Costs (dollars in millions).

Fiscal Year	1996	1997	1998	1999	2000	Total
Current Cost	0.0*	2.4	4.0	3.9	0.0	10.3
* - Item is $45,000.						

b. Explain dramatic changes in cost.

Since we have completed our program for all systems, the resources budgeted for FY 2000 will not be needed. Therefore, we are reporting a .6M reduction in our FY 2000 budget. Also, we expect our actual expenditures for FY 1999 to be less than budgeted. We will not know the exact cost for our program until final billing is received from our Y2K contractors.

c. Changes to schedule, number of mission-critical systems, number of systems behind schedule, or number of systems scheduled to be implemented after March 1999.

There are no changes to our schedule or to the number of mission-critical systems. All mission-critical systems have been renovated, validated, and implemented.

d. Concerns with the availability of key personnel.

No concerns exist about the availability of key personnel.

e. Problems affecting progress?

No problems affecting progress exist.

If you have any questions about this report, please contact Arnold E. (Moe) Levin at (301) 415-7458 or via electronic mail at AEL1@NRC.gov.

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U.S. Nuclear Regulatory Commission

October 20, 1997

MEMORANDUM TO: Thomas H. Essig, Acting Chief
Generic Issues and Environmental
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Office of Nuclear Reactor Regulation

FROM: Melinda Malloy, Senior Reactor Engineer
Generic Issues and Environmental
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Division of Reactor Program Management
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SUBJECT: SUMMARY OF OCTOBER 7, 1997, MEETING
WITH THE NUCLEAR ENERGY INSTITUTE (NEI)
ON "YEAR 2000" SOFTWARE ISSUES
FOR NUCLEAR POWER PLANTS

On October 7, 1997, representatives of the U.S. Nuclear Regulatory Commission (NRC) met with representatives of the Nuclear Energy Institute (NEI) and the Nuclear Utility Software Management Group (NUSMG) at the NRC's offices in Rockville, Maryland. The list of meeting attendees is provided in Attachment 1.

In a letter from James Davis (NEI) to Hugh Thompson (NRC) dated September 15, 1997, Mr. Davis provided an update on actions NEI was taking to help utilities to make their plants "Year 2000 ready." In his letter, Mr. Davis recommended this meeting of industry representatives and interested NRC staff to share views and concerns on industry plans and actions to address "Year 2000" (Y2K) computer software issues relating to nuclear power plants and plant systems necessary to support operations. The meeting agenda is provided in Attachment 2.

John Jolicoeur of the Office for Analysis and Evaluation of Operational Data described the efforts to update the Emergency Response Data System (ERDS) for the Year 2000. His presentation included some background on the ERDS and the importance of date fields to the system. He then detailed the main features of the NRC's ERDS action plan and the current schedule. He is planning to complete testing of the NRC Operations Center ERDS in November 1998. He indicated that where licensees are planning to make software changes to their ERDS interfaces, he needs to know what upgrades licensee are performing on their ERDS software and the projected completion dates. This information is necessary so that he can adequately plan and schedule testing of the NRC-licensee interfaces. Mr. Jolicoeur's talking points are included as Attachment 3.

Hugh Thompson, the NRC Deputy Executive Director for Regulatory Programs, remarked that the NRC has a regulatory framework that if used correctly, will be appropriate for addressing the safety issues associated with the Y2K problem at nuclear power plants. Because of the heightened interest in the Y2K issue, it is important for the NRC to be able to communicate the progress of the regulated community in addressing the Y2K issue for its facilities. He stated that NRC is seeking to have a mechanism for periodic communication between the NRC and licensees regarding licensee progress in addressing Y2K

issues, and he asked for input on what the industry considered to be appropriate in terms of periodic feedback from individual licensees to the NRC. He indicated that the NRC was considering whether a communication mechanism could provide sufficient oversight or whether a special NRC inspection activity would be needed. The NRC would expect each utility to identify a point of contact with whom the NRC could interface on Y2K matters.

Mr. Davis explained that the overall goals of the industry are to keep nuclear power plants safe and on line into the Year 2000. He stated that because of time limitations associated with the Y2K problem, rather than trying to prepare a consensus document, NEI drew upon talent within NUSMG to prepare a framework document for utility use in approaching their Y2K readiness efforts as a project. He said that NEI was not offering the document as an initiative and as such, there was no assurance that all utilities would follow it. For the purposes of discussion, he handed out copies of the draft document to all meeting attendees (these were collected at the end of the meeting per NEI's request since NEI did not want to make the draft document publicly available at this time). He also said that NEI/NUSMG was not looking for the NRC's approval of the document, but was discussing it with the NRC as a courtesy and that they would consider the NRC's comments.

Mr. Davis pointed out that the framework document makes a distinction in terminology between "Y2K readiness" (meaning devices or systems will be able to function properly on and after January 1, 2000) and "Y2K compliant" (meaning devices and systems have been modified to use a four-digit year input correctly). NEI expects to issue the completed document to the industry (through the NUSMG representatives and NEI administrative points of contact) by the end of the month. At that time, the NRC staff will also be provided a copy and the document could be made publicly available. Mr. Davis plans to discuss the Y2K issue during his meetings with utility executives. NEI/NUSMG is planning to offer a full day of training on the framework document for all interested parties on November 14, 1997, in San Francisco. The NRC staff was invited to attend this training session.

Morgan Libby of the NUSMG task force provided an overview of the draft framework document (Attachment 4). He emphasized that the document espouses managing Y2K issues as a project, addressing all appropriate software and interfaces. Quality assurance is embedded in all aspects of the program. He stressed that there is a continuing commitment on the part of NEI and NUSMG to assist the utilities. NEI plans to establish an on-line information exchange mechanism for its members, which will be a forum for the Y2K managers at each utility to share information and advice on their experiences in implementing their Y2K programs. NEI expects that the training to be offered in November and this on-line information exchange will ensure consistent implementation. Other NUSMG task force members then discussed the content of each section of the framework document in more detail. Overall, the task force members believe there is sufficient time for all utilities to make their plants Y2K ready.

Jared Wermiel, Chief of the Instrumentation and Controls Branch and the NRC's Y2K program manager for power reactors, provided feedback on behalf of the NRC staff to NEI and NUSMG on their presentation and the draft framework document. He commended NEI and NUSMG on their development of a good reference document in such a short period of time and their plans to offer training to utilities. He expressed his view that all licensees attend the training session NEI/NUSMG will be offering. He indicated that licensees should be addressing safety-related systems first in their Y2K programs. He also indicated, however, that the NRC staff also recognizes that Y2K issues that do not directly impact public health and safety should not impede nuclear power plants staying on line.

Mr. Wermiel remarked that the draft document did not provide as much detail as was conveyed by the task force members in their section-by-section presentations. He stated that the NRC would like to see revisions to address and/or stress the following points:

- The iterative nature of the Y2K program efforts. Many steps of the process overlap and may need to be repeated.
- The need for initial testing, remediation, and post-remediation testing to ensure that problems have been adequately addressed.
- The "living" nature of the project. A feedback loop should exist wherein utilities compare their progress to the established plan and make appropriate adjustments to the plan and schedule.

Mr. Wermiel explained that the staff was not yet in a position to say more about its future plans for ensuring that licensees address Y2K issues beyond what was said in SECY-97-213, "Year 2000 Computer Issue," September 24, 1997. He stated that the NRC needs confidence that its licensees are doing the right things to become Y2K ready. In order to obtain that confidence, he indicated that the NRC may need certain information from licensees (perhaps via issuance of a letter to licensees pursuant to 10 CFR 50.54(f), as was discussed in SECY-97-213). Information of interest would likely include licensee plans and schedules.

The relative merits of the NRC issuing a 10 CFR 50.54(f) letter were discussed, although it was clear that some industry representatives present were not supportive of this approach. Some of the industry representatives suggested that an NRC bulletin on Y2K may be more appropriate. Mr. Wermiel indicated that the NRC may request, at some point in time, a licensee certification that their plant(s) are Y2K ready. He said that the NRC has not yet decided whether it should require periodic reports from licensees and whether it needs to perform follow-up inspections. However, the NRC does need to make sure that every licensee is on a path to meet its implementation schedules for addressing Y2K issues.

Mr. Davis responded that NEI wants to keep open the lines of communication with the NRC on this topic, and it is important to NEI that it has a clear understanding of what concerns the NRC needs to address.

Attachments:

1. List of Attendees
2. Meeting Agenda for 10/7
3. NRC's Talking Points on Updating ERDS for Y2K
4. NEI's/NUSMG's Briefing Slides

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Reports from U.S. Nuclear Power Plants During the Y2K Transition

This report from the Y2K Early Warning System (YEWS) contains descriptions of minor problems experienced by U.S. nuclear plants during the Y2K rollover from December 31 to January 1. The YEWS was intended to provide early notification to licensees, especially those in time zones further west, of potential Y2K problems at other plants. Event descriptions were prepared by NRC staff who were onsite at the time of the event. The descriptions reflect the information provided by licensees shortly after the event which was entered into YEWS at that time. None of these events affected the continued safe operation of the plants. A description of follow-up actions has been added for completeness.

It should be noted that the reported events represent all the events involving U. S. nuclear plants that were entered into YEWS. Minor problems may have occurred at other nuclear power plants which were not reported by licensees or entered into YEWS due to their low significance or similarity to previously reported problems.

Plant Name-Time	**Arkansas Nuclear 1 and 2** 01/01/2000@00:30
Description of Event:	After the transition to the year 2000 (Y2K), an operator and computer support technician attempted to program an electronic dosimeter in preparation to enter the radiologically controlled area (RCA) which is common to both units. The electronic dosimeter was unable to be programmed using the normal method at two computer programming stations. At that time, computer personnel determined that the software patch had not been uploaded to the computers. The patch was then uploaded to all stations successfully. Personnel would have been capable of programming the electronic dosimeter manually and entering the RCA.
Follow-up	This was considered to be a Y2K-related event. Because the software was repaired and the systems restored during the Year 2000 transition period, no follow-up action was considered necessary.
Plant Name-Time	**Indian Point 3** 01/01/2000@00:00
Description of Event:	At the Y2K transition there were two computer-related anomalies. Meteorological data, displayed digitally at a Control Room back panel, appears to have failed at the rollover. Wind speed, direction and stability were included in the display. Stability froze for about 30 minutes and then went blank. Wind speed and direction were displaying the same value and were considered frozen. The time stamp indicated as 2445 instead of 0045 and temporarily froze. Troubleshooting was still in progress at 0200 EST hours. Backup meteorological tower data was available and agreed with information at Indian Point Unit 2. Meteorological tower data is provided to Indian Point Unit 3 from the 10-meter elevation. Also, a control room digital display of the main generator stator temperature and an associated data logger correctly operated at 0000 EST, but failed to display the temperature data at 0100 EST. A strip recorder for the same data was

	operating correctly and was available to the operating staff for information purposes. The temperature data was not required by their license. The licensee rebooted the computer and the 0200 data printed automatically. Accordingly, the licensee considers the display returned to normal service as of 0200 EST. These occurrences had no operational impact or safety significance.
Follow-up	This was considered to be a Y2K-related event. Because the software was repaired and the systems restored during the Year 2000 transition period, no follow-up action was considered necessary.

Plant Name-Time	**Millstone 2** 12/31/1999@19:00
Description of Event:	An averaging program subroutine in the process computer which interfaces with programs using GMT gave erroneous results after 7:00pm EST (0000 GMT). Apparently only 2 averaged values were affected -- time average wind speed at the 142-foot elevation and time averaged readings from the in-containment gaseous and particulate radiation monitors. The operation of the plant was not affected, and there was no impact on safety. The instantaneous readings were not affected, and the averaging programs were reset successfully. The anomaly appears to be related to the Leap Year Calculation Model used in the subroutine. The licensee is still evaluating this anomaly
Follow-up	Millstone reports that this was not a Y2K problem but a leap year problem. This problem occurs every new year's eve (before a leap year) between 7:00 p.m. and midnight. A condition report was generated and the subroutine instructions were modified by information technology specialists so that the software will perform correctly in the future. Because this problem was entered into the licensee's corrective action program, no direct follow-up will be conducted on this item, other than in routine inspections of the licensee's corrective action program.

Plant Name-Time	**Monticello** 01/01/2000@00:30
Description of Event:	At the GMT Y2K transition there was a computer-related anomaly. The Met Tower computer (MIDAS) interface with the plant process computer (PPC) failed. The PPC would not accept data from the MIDAS computer. The MIDAS computer and associated control room chart recorders and instrumentation remained operational. Emergency preparedness meteorological data was unaffected. The PPC was also unaffected by the interface failure.

Follow-up	The MIDAS (met tower) computer was rebooted early on 1/1/00 which corrected the problem. Subsequent investigations revealed that the application problem was not caused by a Y2K related problem, but rather a known software inconsistency. The problem occurs when the met tower is writing a file for the process computer to read and the process computer attempts to read the file at the same time. The attempt to read simultaneously while writing happens infrequently. The result is a "file in use" error message sent to the process computer. After 6 attempts (at computer speed) the process computer writes a log message that an interface failure occurred. The computer log indicated that time and date were correct and the problem occurred due to a record lock (file in use) condition. This was a known problem, and because the met tower to process computer interface is not required and used as "information only," an immediate fix had not been planned. The licensee is investigating several strategies to correct the deficiency. The error on the Y2K roll-over was determined Monday afternoon to be a purely coincidental failure of this type.
Plant Name-Time	**Nine Mile Point 1** 01/01/2000@00:00
Description of Event:	A problem with the transmission of data from the meteorological (MET) monitoring system to the MET database occurred at the Y2K transition. This failure affected two systems due to their dependence on the MET data. The failure affected the emergency response data system (ERDS), an NRC system maintained by the licensee that provides plant parameter data, and the emergency dose assessment monitoring system (EDAMS). These systems will be capable of performing their functions by entering data manually in the case of EDAMS, or through verbal update to the NRC in the case of ERDS. The meteorological monitoring system is still providing accurate and complete weather data to the control rooms. The operation of the plant was not affected and there was no impact on safety. Computer technicians are looking into the problem. This problem also affected transmission of MET data to the adjacent FitzPatrick facility. However, the necessary data is still available and being manually entered into FitzPatrick computer systems.
Follow-up	The licensee stated that the meteorological problem was not Y2K related. It related to the long-term storage of data (>14 days). The licensee states that a software module failed and that this type of failure is not unusual. The system was rebooted successfully. There was no need for a contingency action since only long term data was affected and short term data was still available.
Plant Name-Time	**Palo Verde 1, 2, and 3** 12/31/1999@17:00

Description of Event	The satellite signal to the Kinemetrics 468DC Receiver which feeds the True Time IRIG-B clocks in each unit's emergency response facility data acquisition display system (ERFDADS) (non-safety related SPDS) system became invalid. All three units' ERFDADS determined that the day (Julian) is invalid, and all three computer systems have defaulted to their own internal system times. This situation is true for the new Digital Feedwater (DFW) System in Unit 1 as well. This has had no impact on proper functioning of these systems. At the rollover to 00:00 1 January 2000, the IRIG-B clocks re-synchronized to the satellite receiver signal. All computer systems utilizing this signal for time synchronization are now synched to the satellite clock.
Follow-up	A satellite signal for time synchronization is sent to a receiver on Unit 1 which then transmits the time signal to ERFDADS for all three units and to digital feedwater on Unit 1. This signal is transmitted once per hour. At midnight GMT the satellite time shows the year 2000 while the three ERFDADS clocks and the DFW clock show 1999. With the year difference the clocks will not synchronize with the satellite time. However, synchronization will occur at Midnight (Palo Verde time) as the clocks then will be in the same year as the satellite time. Apparently this is not unique to Y2K but happens every new year's eve. The problem lies with the receiver on Unit 1. The licensee has not noticed this in previous years and does not consider this to be a concern that needs correcting as the clocks will synchronize within the seven hours and no significant time difference (2 seconds) is seen during this short period.

Plant Name-Time	**Pilgrim 1** 01/01/2000@00:00
Description of Event:	When performing the 3D Monicore computer program trend plots, the licensee successfully completed the hourly and daily trend plots. However, when running the monthly trend plot, the 3D Monicore color graphics interface stopped displaying data but was restored within a few minutes. The licensee was able to ascertain core power and thermal limits were met at all times. The licensee has determined that system functionality is not affected. It is believed this is a generic issue (other BWR plants had related issues). Plants will work with the General Electric Boiling Water Reactor Owners Group (BWROG) to resolve.
Follow-up	This was considered to be a Y2K-related event. There has not been a final determination made whether or not this is a generic concern. However, it appears to have only affected the plant specific graphic interface. General Electric has notified the other BWRs with similar 3D Monicore programs and the issue and its final resolution is still under review. NRC staff will continue its interaction with General Electric and the BWR Owner's Group regarding this issue.

Status of Year 2000 Readiness Activities at Fuel Cycle Facilities as of January 13, 2000

Site	Type of Facility [1]	Is Site Y2K Ready for Safety and Safeguards? As of what date?	Only performed low-risk, low-safety-significant activities during Y2K Transition?	Did Site have Plans for Controlled Startup after Y2K Transition?	Minor Y2K Problems after the Transition?
AlliedSignal	UF6	Yes (07/01/1999)	Yes	Yes	No
BXW Technologies	HEU	Yes (11/01/1999)	Yes	Yes	No
ABB-Combustion Engineering-Hematite	LEU	Yes (07/01/1999)	Yes	Yes	No
Framatome Cogema Fuels	LEU	Yes (07/01/1999)	Yes	Yes	No
General Electric-Wilmington	LEU	Yes (09/01/1999)	Yes	Yes	No
Nuclear Fuel Services	HEU	Yes (11/01/1999)	Yes	Yes	No
Siemens Power Corporation	LEU	Yes (11/01/1999)	Yes	Yes	Yes [2]
United States Enrichment Corporation	GDP	Yes, for both facilities (07/01/1999)	No, for both facilities	N/A	No
Westinghouse Electric Company	LEU	Yes (12/28/1999)	Yes	Yes	Yes [3]

[1] Type of Facility Legend:

GDP = Gaseous Diffusion Enrichment Facility HEU = High Enriched Uranium Fuel Fabrication Facility

LEU = Low Enriched Uranium Fuel Fabrication Facility UF6 = Uranium Hexafluoride Production Facility

[2] Siemens Power Corporation: Failure of touch probe system used for logging workers into work zones for tracking occupancy. Some of the probes were Y2K Compliant and other were not. Software corrections were made and all probes working normally. No data from personnel entries or occupancies was lost.

[3] Westinghouse Electric Company: UNIX system which handles accountability for rods and machine parts produced a date of 2010. It was noticed on 1/1/2000 and corrected on 01/03/2000. Safety of facility not affected because it did not begin operations again until 01/04/2000.

Notes:

- NRC inspected the Y2K status at the facilities in 1997 and 1998, in conjunction with other safety inspections
- NRC conducted follow-up Y2K inspections at the Portsmouth GDP in August 1999 and at the Paducah GDP in September 1999
- NRC had cognizant staff in the HQ Operations Center to respond to the facilities during the Y2K transition on December 31, 1999
- NRC had cognizant staff in the Region IV IRC to respond to the facilities during the Y2K transition on December 31, 1999

- NRC had a resident inspector at each GDP and HEU during the Y2K transition on December 31, 1999

CCNPP Y2K ContingencyPlanning

John Carroll

7/15/99

Calvert Cliffs is Y2K Ready however...

- Others may not be ready
- Something may have been overlooked

Objective

- To ensure the safe and reliable operation of Calvert Cliffs even if extensive assessment and remediation efforts are not successful

Methodology

NEI 98-07 "Nuclear Utility Year 2000 Readiness Contingency Planning Guideline"

- Risk Identification
- Risk Assessment
- Risk Management

Risk Identification

- Internal Inventory
  - 25,000 items identified for assessment
- External inventory
  - 950 vendor and service agencies
- Date Sensitivity
  - 400 internal
  - 140 external

Risk Assessment

- Define Critical Events
  - Unplanned Shutdown or trip
  - Unplanned power reduction
  - Hazard to personnel safety
  - Unplanned release of radioactive material
  - Inability to achieve and maintain safe shutdown
  - Inability to implement EOPs
  - Inability to cool spent fuel
  - Inability to implement site emergency plan
  - Inability to implement site security plan

Risk Assessment

- Screening
  - Consequence- affect on critical events
  - Likelihood- confidence in remediation
  - Immediacy- When will affect occur

Risk Assessment

- Risk Score =Consequence Score * Likelihood Score* Immediacy Score

- ICP required if Score =40

Risk Assessment

- LOOP scored >40 - ICP Required
- Team identified six other categories where ICPs would be prudent
  - Communications
  - Supply Chain Disruptions
  - Loss of Main Feedwater
  - Loss of Plant Process Computer
  - Maintenance, Modification, and Testing
  - Loss of critical Computer applications

Risk Management

Loss of Offsite Power

- Briefing on grid conditions prior to rollover
- Training on LOOP
- Second shift of operators on site
- Training on operation at reduced load
- Discretionary TS relief

Risk Management

Communications

- 60% ERO on site during rollover
- Remainder of ERO on call and fit for duty
- Satellite phones in CR and EOF
- Training on back-up communication systems
- Telecommunications personnel on site

Risk Management

Supply Chain Disruptions

- Maximize inventories of critical consumables
- Calibrate critical test equipment prior to rollover
- Validate process for manual ordering parts and consumables
- Prepare plant staff for disruptions
- Contact priority suppliers after rollover to verify continuity of service

Risk Management

Loss of Main Feedwater

- Training for Operations personnel
- Additional Operators on site
- Maintenance and Engineering personnel on site

Risk Management

Loss of Process Computer

- Data Backups
- Complete surveillance prior to rollover
- Computer support staff on site

Risk Management

Maintenance, Modification, and Testing

- No discretionary testing, modifications, or maintenance from 12/27/99 until 1/7/2000.
- Schedule surveillance's outside 12/27/99 - 1/7/2000

Risk Management

Loss of Critical Computer Applications

- MO Planning
- Spare part retrieval
- Engineering package generation
- Dose control and RCA access
- Protected and Vital Area access
- Training and Qualification Records

Manual processes being validated, backup data will be generated, training will be provided, and additional staff will be on site

Summary

- Calvert Cliffs has relatively small dependence on digital technology
- Confident that assessment and remediation have been effective
- Calvert Cliffs will continue to operate safely and reliably during the rollover and into the year 2000.

Nuclear Preparedness for the New Millennium

Michael J. Sharon
Nuclear Power Plant Emergency Division
Maryland Department of the Environment

AGENDA

- Introduction and Concept of Operations
- Dose Models and Information Systems
- Instrumentation
- Communications
- Contingency Planning
- Questions and Answers

Introduction

- **Plume EPZ Facilities: Calvert Cliffs, Peach Bottom**
- **Ingestion EPZ Facilities: Limerick, North Anna, Salem/Hope Creek, Three Mile Island**
- **Research Reactors and RAM Transportation**

Concept of Operations

- State-level Decision Maker (Secretary of MDE) and technical team respond to EOF at Alert or higher ECL.
- Decision Maker coordinates Protective Action Decisions with State EOC and Counties
- Utility and MEMA Liaisons at all EOCs; MDE Health Physicist at State EOC

Dose Models

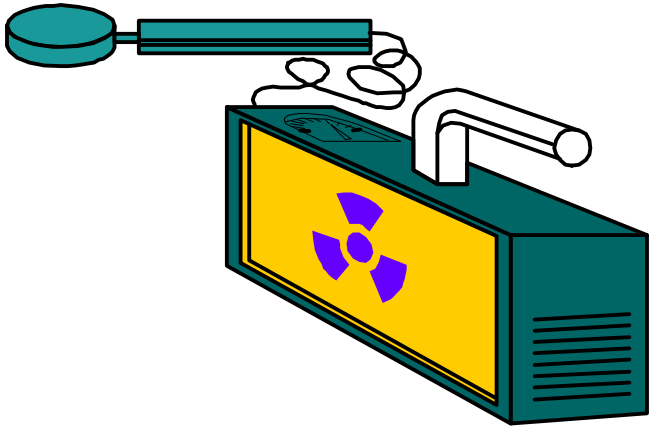
- **RASCAL 2.2 (April 98): Y2K Compliant**
- **RADDOSE-V 1.0: BGE Model, Y2K Compliant**
- **MESOREM 8.0: PECO Model, Y2K Compliant**
- **If all else fails…..**

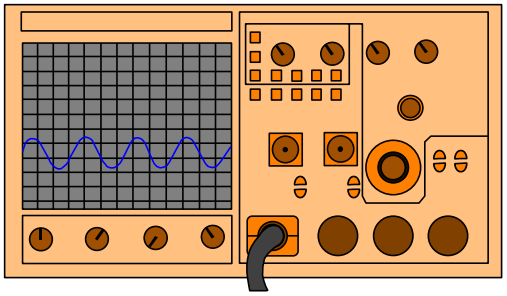
Other Information Systems

- **ERDS: Latest Version Installed and Operational**
- **COTS Software (MS Office, etc): Y2K Compliant**
- **PCs associated with Nuclear Response Are Y2K Compliant; software also loaded on laptop PCs.**

Instrumentation

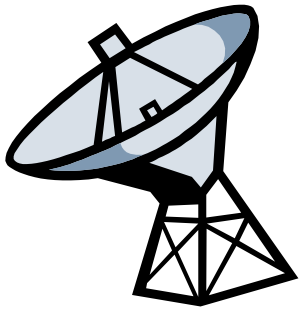
- **Field Monitoring and Sampling Equipment is mostly analog; all Y2K Compliant**
- **State Laboratory instrumentation recently upgraded and is Y2K Compliant**

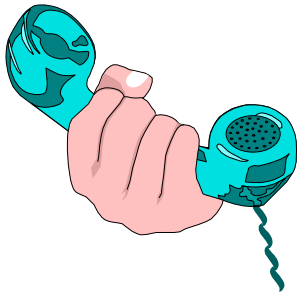


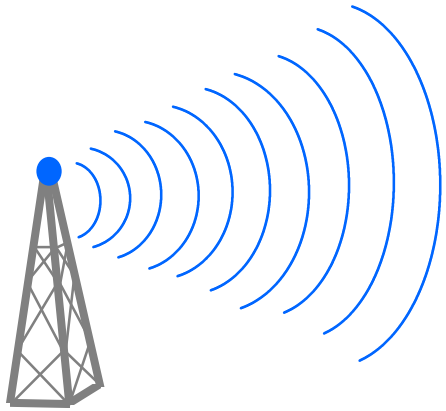


Communications

- **Alert and Notification Systems are Y2K Ready**
- **Multiple Back-Up Systems are Available and Tested**
- **Some Vulnerabilities May Exist (external service providers)**

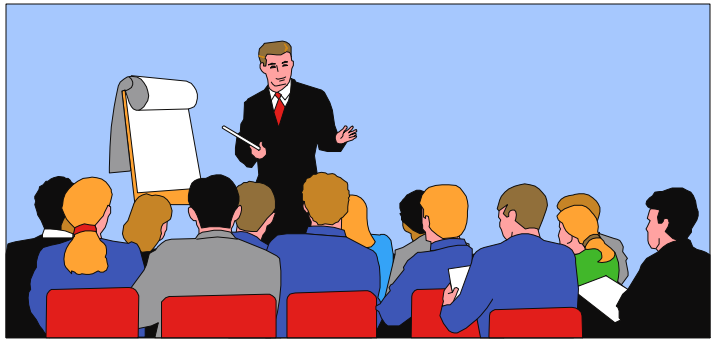






Contingency Plans

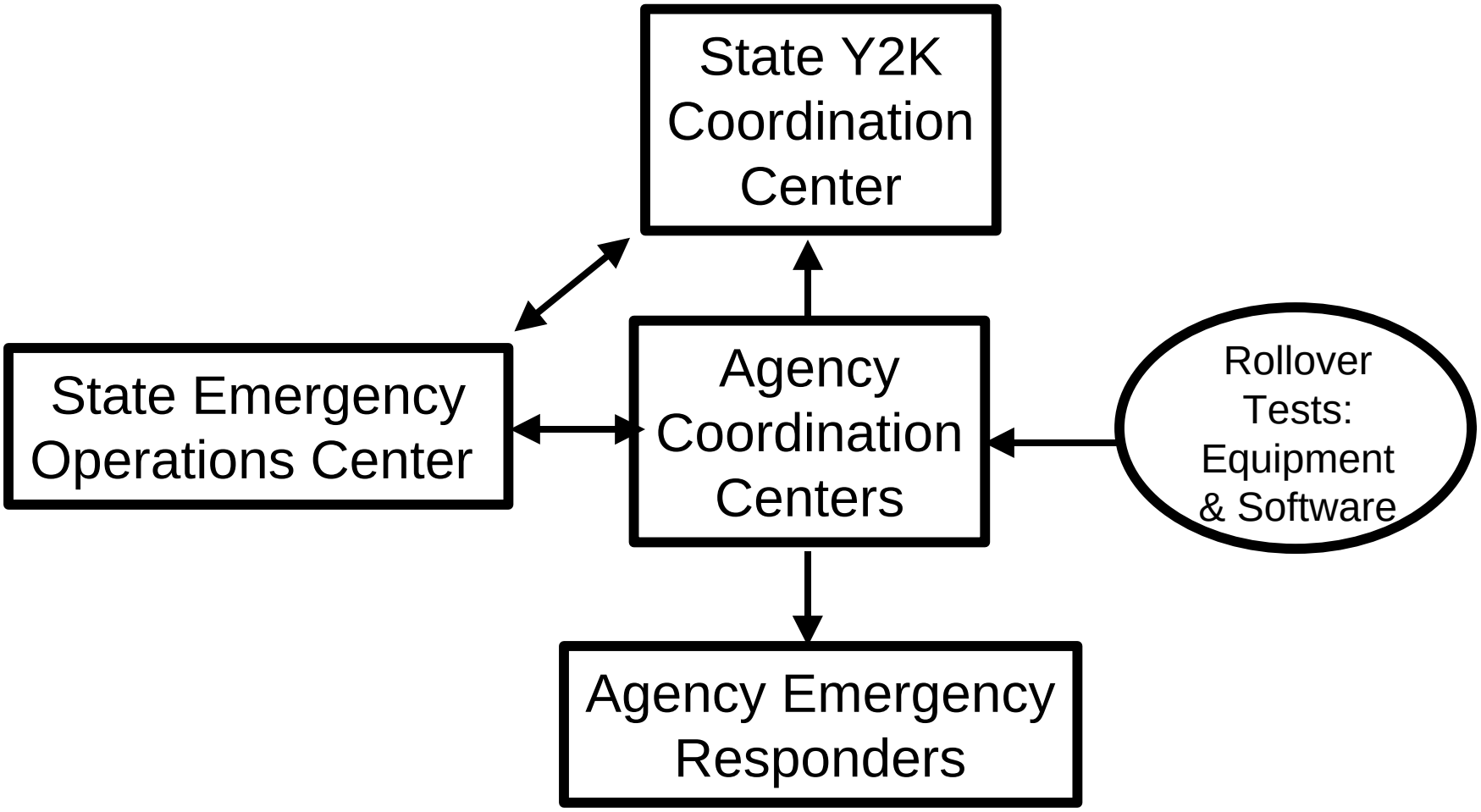
- Cooperative Efforts in Progress
- State Efforts - Mitigation
- State Efforts - Preparedness
- December 31, 1999



December 31, 1999

- State and Agency EOCs Staffed
- EOF Resources Available
- Y2K Coordination Center
- Couriers to Notify and Transport Staff
- System Testing and Regular Status Reports
- Centers Staffed for Prolonged Period if Required

Y2K Operations Scheme



QUESTIONS ?

Calvert County Y2K Planning

Donald Hall, Director
Calvert Emergency Management

Draft Contingency Plan

- Identify the situation
- Establish direction & control
- Identify affected agencies
- Assign responsibilities
- Identify logistics

Coordinate Efforts with Local Utilities

- Contingency planning
- Y2K readiness
- Exercise
- Arrange for EOC representation

Participate in Statewide Exercise

- All State and Local Agencies

Conduct Work Shops with Key Public Safety Agencies

- Perform risk assessment
- Establish detailed contingency plans
- Establish checklists

Evaluate & Revise Plans

- Lessons learned from exercises

Establish & Implement Public Education Program

- Local media ads
- Town meetings
- Civil groups, etc.
- Coordinate messages with utilities

Activation of EOC & EOP on or Before 12/31/99

- Key Public Safety agencies
- County officials
- Utility representatives

Calvert Cliffs Nuclear Power Plant Specific

- County emergency Operating Plan (EOP)

- County Radiaological Emergency Plan (REP)

Automatic Staffing of EOC

- Key players - time to be determined
- Radiological event staff
  - Additional contact numbers and physical location of staff to be on file
  - BGE Technical Representatives present in EOC

Communications

- Constant contact with Emergency Operating Facility (EOF)

- Back-up communication links in place
  - Phone lines (commercial)
  - Dedicated phone lines
  - Radios (security & fire)
  - Cell phones
  - RACES

Alert & Warning

- Emergency Alert System Stations on alert
- Route alerting if necessary
- Telecommunicator system
- Pre-established instructions to citizens

U.S. Nuclear Regulatory Commission Contingency Plan for the Year 2000 Computer Problem in the Nuclear Industry

NRC Y2K Training and Tabletop Exercise

Joseph G. Giitter, Chief
Operations Section
Incident Response Operations
United States Nuclear Regulatory Commission
July 14, 1999

NRC's Comprehensive Y2K Program
(www.nrc.gov/NRC/NEWS/year2000.html)

- Internal systems remediated
  - **Remediation completed 2/5/1999**
  - **Contingency plans developed**
- Oversight of NRC licensee remediation and contingency planning efforts
  - **Reactors**
  - **Fuel cycle facilities**
  - **Materials (industrial, medical, etc.)**
- NRC Y2K Contingency Plan

Y2K CONTINGENCY PLAN ASSUMPTIONS

- Localized electrical grid disturbances / power outages.
- Local or regional telecommunications outages.
- At least two NRC-licensed facilities adversely impacted (requiring NRC response)
- Unforeseen Y2K problems will place a dozen or more licensees in situations that may not impact safety but may depart from a license condition or a technical specification

Three Aspects to NRC Contingency Plan

- Incident Response
- Information Sharing
- Regulatory Response

INCIDENT RESPONSE

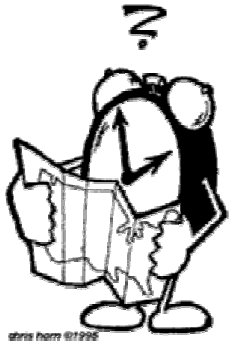
- NRC will primarily rely on existing incident response procedures

- Special Y2K Response Team
  - Y2K response team at NRC headquarters operations center
  - NRC Region IV (Arlington, Texas) will back-up headquarters
  - Small number of staff in regional incident response centers
  - Resident or regional inspector at each site

INFORMATION SHARING

- "Y2K Early warning system" will utilize time zone differences
  - Reports from foreign/U.S. Nuclear Power Plants
  - Information shared with NRC nuclear power plant licensees and the Information Coordination Center established by the President's Council on the Year 2000 Conversion

- Backup communication systems employed
  - Satellite-based communication with residents/sites
  - National Telecommunication Coordination Network



REGULATORY RESPONSE

- NRC staff will be prepared to respond to Y2K problems that could affect continued plant operation--provided that safety is not compromised!
- Supports broader public interest of a stable and reliable electrical grid

NRC COORDINATION on Y2K

- Industry (NEI, utilities, NERC)
- Public
- President's Council on the Year 2000 Conversion
- Federal Agencies
  - **FEMA**
  - **National Communication System**
  - **Department of Energy (FRMAC assets)**
- International (IAEA, NEA, Canada)

Y2K Exercise/Workshop Schedule

FRP Table Top	*May 19-20*
FEMA Y2K REP Seminars	May-Aug
NRC Y2K Table Top	July 14
National Y2K Table Top	Sept. 18, 25
NRC Full-scale Y2K exercise	Oct. 15
Implement Y2K Contingency Plan	Dec 31 - Jan 1

Federal Response Plan
Operations Supplement

Y2K Consequence Management

Federal Response Plan

- Provides mechanism for coordinated delivery of Federal assistance to augment State and local governments overwhelmed by a major disaster or emergency.
- Used in hundreds of disasters and emergencies since 1992.
- Involves 26 Federal agencies and the Red Cross.
- Establishes Federal Coordinating Officer (FCO).
- Assigns Primary Agencies for each of 12 Emergency Support Functions.

Emergency Support Functions

ESF	Primary Agency
• Transportation	• Department of Transportation
• Communications	• National Communications System
• Public Works and Engineering	• Department of Defense
• Firefighting	• Department of Agriculture
• Information and Planning	• FEMA
• Mass Care	• American Red Cross
• Resource Support	• General Services Administration
• Health and Medical Services	• Dept of Health and Human Services
• Urban Search and Rescue	• FEMA
• Hazardous Materials	• Environmental Protection Agency
• Food	• Department of Agriculture
• Energy	• Department of Energy

Purpose of Y2K Operations Supplement

- FRP will serve as the basis for the Federal Government's response to Y2K emergencies.

- Supplement describes unique actions to support response to Y2K emergencies:

  - Ongoing monitoring
  - Information collection and dissemination
  - Direction and control
  - Resource allocation/adjudication

- Supplement does not repeat FRP policy and procedures.

Scope of Supplement

Involves two major areas:

- Operational Readiness *(pre-event)*
  - Increased readiness and deliberate planning.
  - Monitoring, including “early warning” information from other countries.

- Consequence Management *(post-event)*
  - Heightened situation monitoring.
  - Provision of Federal assistance.

Scope of Supplement
(cont' d)

Does Not Address:

- Cyber-terrorism attack.
- Localized civil disturbance.
- National security emergency.
- Long-term economic recovery.

Situation

Overarching View of Y2K

- No major nationwide catastrophic disruptions are anticipated.
- Possibility exists for smaller localized disruptions occurring simultaneously across the country.
- Cumulative effect of Y2K disruptions may stress State and local resources.
- Severity and magnitude of Y2K problems cannot be predicted.

Ongoing/Concurrent Disasters

- Potential occurrence of natural/technological events during rollover exists.
- Y2K response needs to be coordinated with any other response.

Policies

- Response to Y2K consequences should be handled at the local and State level prior to requesting Federal assistance.
- A Presidential “emergency” rather than “major disaster” declaration will be made if Y2K consequences exceed State/local response resources.
- Except in extreme life-threatening situations, Federal response resources may not be deployed until an initial nationwide needs assessment has been conducted.
- Federal operations will be decentralized to the Region to the maximum extent possible. Overall policymaking and resource deconfliction, not resolved in the Region, will be centralized at Headquarters.
- Critical resource allocation decisions will be based upon threats to life, public health and safety, and property.

Planning Assumptions

- Most Federal/State mission critical emergency response systems will be Y2K compliant.
- Y2K disruptions, like natural disasters, may temporarily interfere with normal life. Individuals should maintain emergency supplies for a reasonable period consistent with normal preparedness measures.
- The Federal Government may experience temporary shortages of critical response resources, leading to resource allocation and adjudication among States.
- Certain DoD assets may not be available for response to domestic Y2K disruptions.
- Many foreign countries are not Y2K compliant; disruptions in these countries could affect the United States.

Federal Monitoring Operations

- EST and ROCs will be operational from December 28 through January 4.
- Many other Federal agencies also will activate their EOCs.
- State EOC activation periods will vary depending on each State's operational concept.
- Operations Supplement provides:
  - Table listing all Federal, Regional, and State EOC schedules.
  - Federal assets on call by ESF.
  - Increased operational readiness status.

“Early Warning System”

- **<u>Information Collection from Other Countries</u>:**
  - Agencies with heavy international presence (DOS, DoD, CIA, etc.,) will collect information on Y2K effects in other countries prior to rollover in the United States.
  - FEMA will establish a direct line of communication with its emergency management counterparts in a number of other countries to obtain information on critical infrastructure elements.

- **<u>Early Intelligence Will</u>:**
  - Provide vital, upfront indication of risks and consequences that might be expected in the United States.
  - Keep the media and public fully informed of the potential impacts on the domestic Y2K situation based on events in other countries.

Y2K Information Coordination Center

- Arm of President's Council on Y2K Conversion.
- Has lead for collecting and exchanging information on status of critical systems, key industrial sectors, Y2K consequences.
- Will support decision making.
- Will establish Joint Information Center.

Public Information

- Public confidence critical.
- Need <u>one</u> consistent message:
  - Assure public that Federal Government is Y2K compliant.
  - Allay concerns regarding major disruptions, yet recognize potential for localized events.
  - Describe prudent preparedness measures to be taken.

Special Y2K Staffing

Regional Liaison

- Upon request, Regional Liaison to deploy to State EOC during pre-event monitoring.
- Will provide technical assistance.

FCO

- RD in each Region will be designated FCO.
- Will be located at Regional Office/ROC.

Deputy FCO

- Will be selected from qualified Regional Staff or FCO cadre (may be Regional Liaison already at State EOC).
- Will be located at State EOC.

Resource Requirements

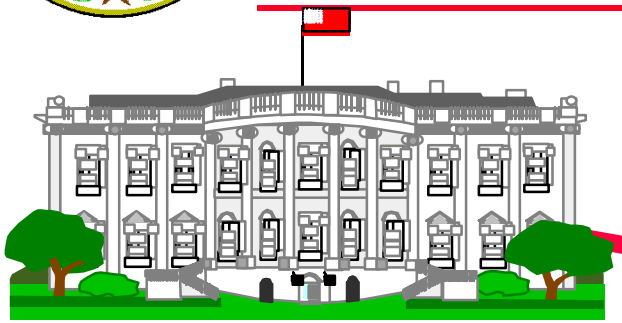
- States have been requested to identify three major unmet needs that may require Federal support.
- Indication of expected unmet needs will provide basis for ESFs to anticipate State resource requirements.
- ESFs should address resource augmentation requirements as required.

Types of Assistance Available

- Food, water, medicine, and other essential needs
- Shelters, emergency care, temporary housing
- Debris removal
- Emergency repairs and demolition
- Search and rescue
- Removal of health and safety hazards
- Emergency communications, emergency access, and emergency public transportation

Government Emergency Telecommunications Service (GETS)

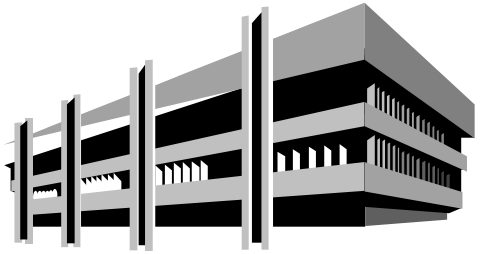
National Communications System (NCS)



Committee of Principals

FEMA	State
NASA	Defense
FCC	Interior
NSA	Commerce
USPS	Transportation
FRB	Treasury
NRC	Justice
NTIA	Agriculture
USIA	Energy
CIA	GSA
HHS	JS
VA	

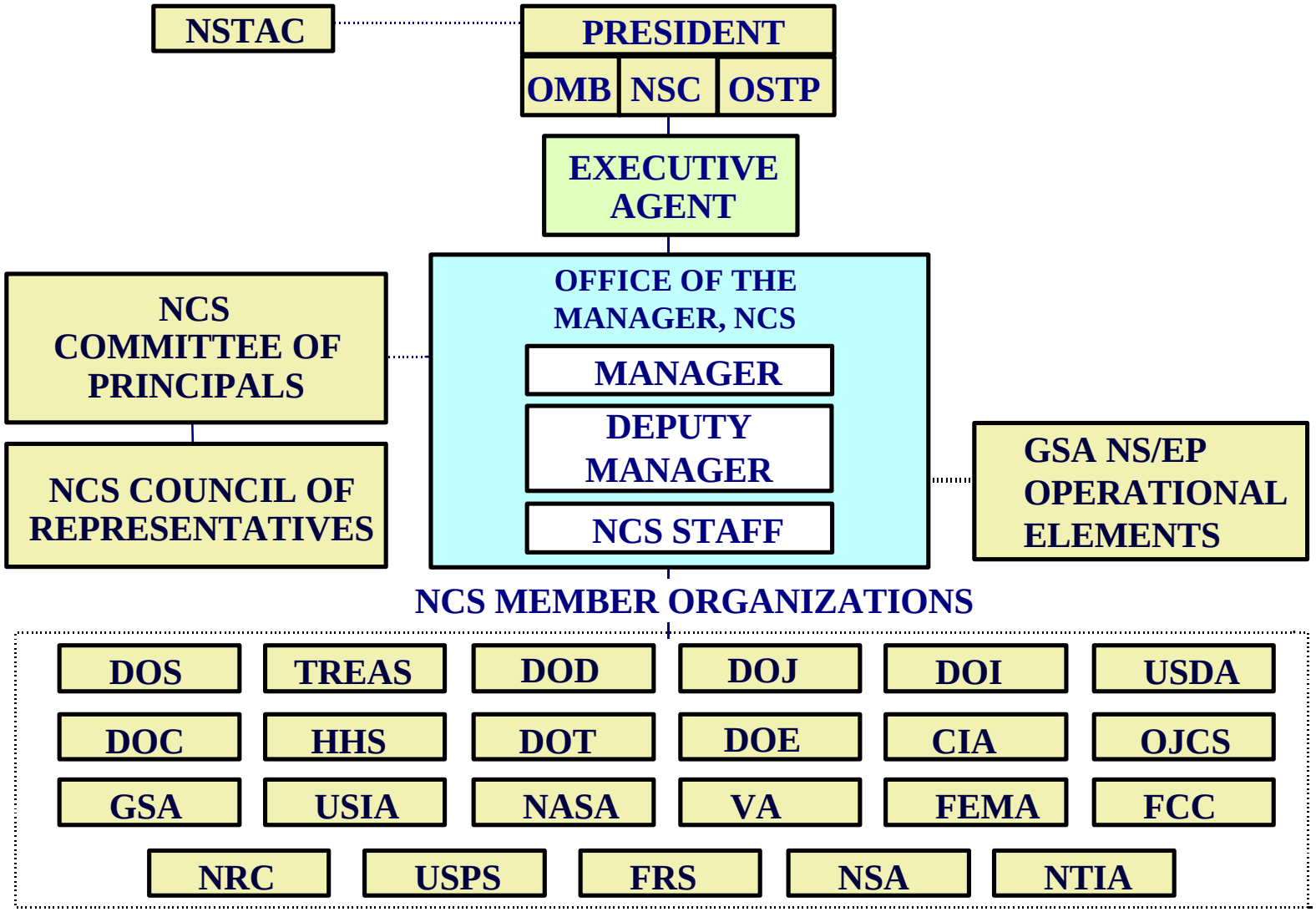
NS/EP Support



NSTAC

ADTC	MOTOROLA
AT&T	NORTEL
BANKAMERICA	NTA
BOEING	RAYTHEON
COMSAT	ROCKWELL
CSC	SAIC
EDS	SPRINT
ESET	TELEDESIC
GTE	TRW
HUGHES	UNISYS
ITT	USTA
LOCKHEED	US WEST
MARTIN	
MCI WORLDCOM	

NCS Organization



Objective Of GETS

Provide Authorized Government Users With A Nationwide NS/EP Switched Voice And Voice Band Data Communications Service By Utilizing The Surviving Public Switched Network (PSN) Resources Under A Full Range Of Conditions:

- -- Crisis
  - -- Natural Disasters
    - -- All-Hazards

Why The PSN?

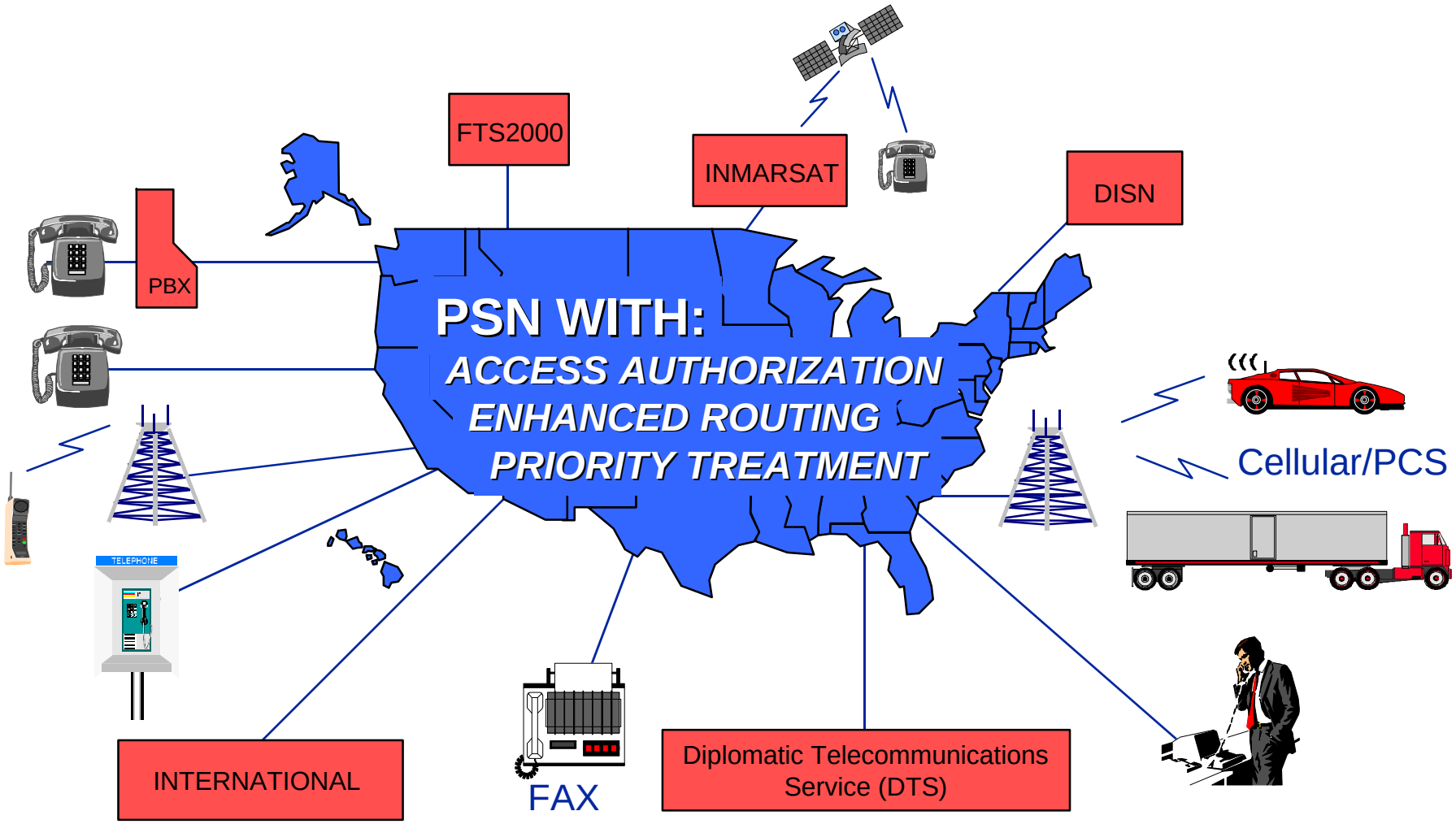
GETS Is Based On The PSN Because:

- **95 Percent Of Government Telecommunications Needs Are Met By The PSN**
- **The PSN Is Ubiquitous, Robust, And Flexible**

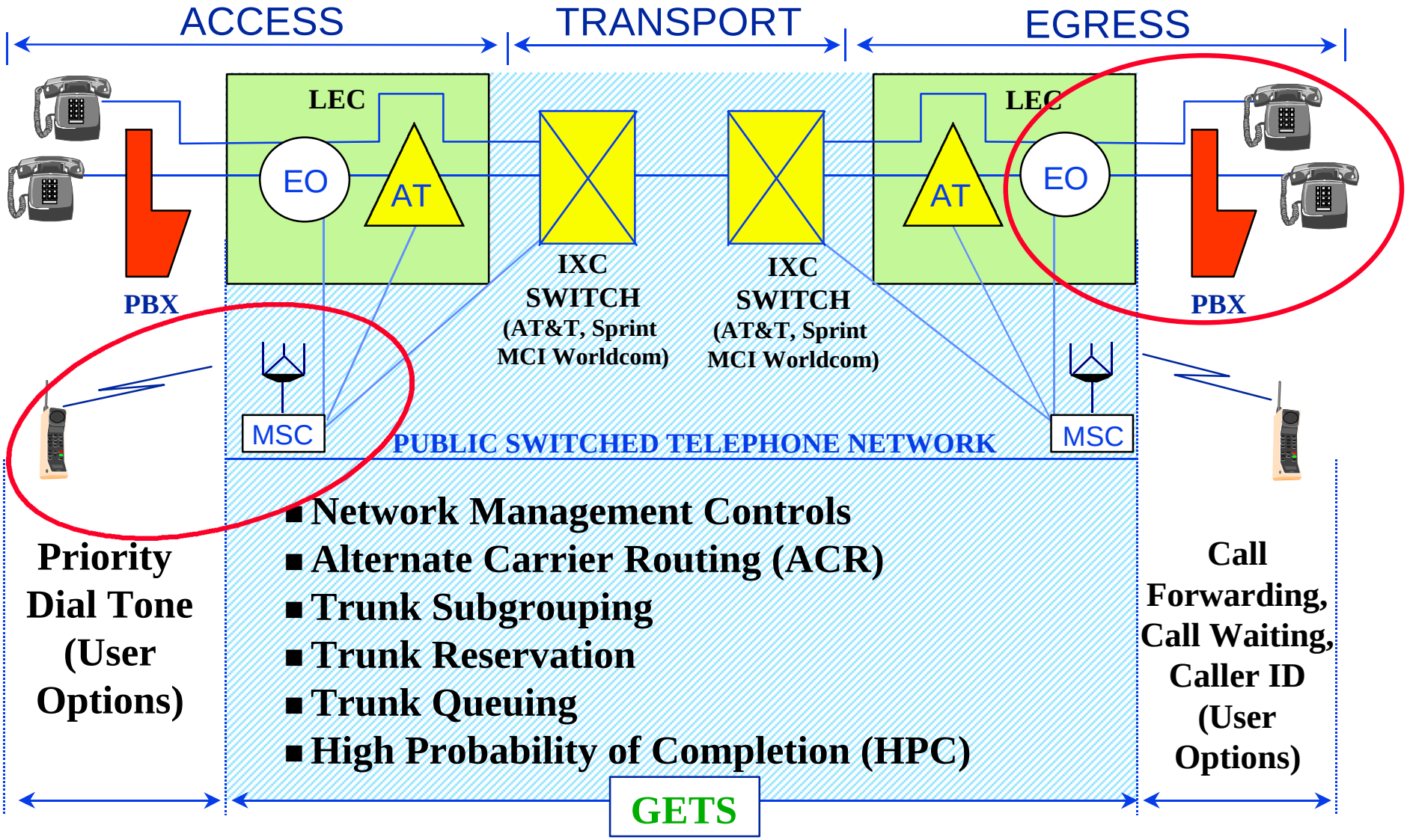
Therefore:

- **GETS Provides *Improvements* In The PSN For NS/EP Telecommunications**
- **The PSN Will Provide For The Continuing Technical *Evolution* Of GETS**

Operational Concept

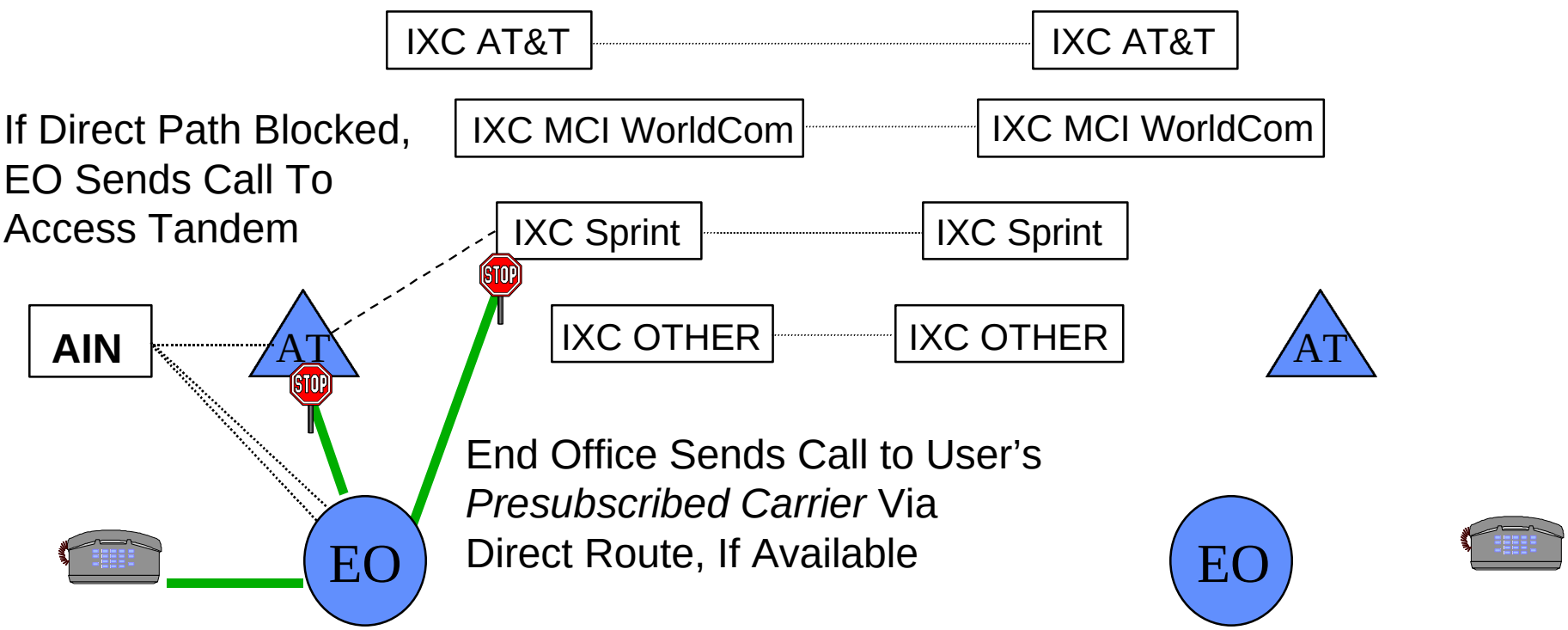


Priority Treatment Placement



- Network Management Controls
- Alternate Carrier Routing (ACR)
- Trunk Subgrouping
- Trunk Reservation
- Trunk Queuing
- High Probability of Completion (HPC)

POTS Routing



If Direct Path Blocked, EO Sends Call To Access Tandem

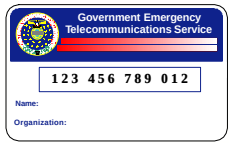
End Office Sends Call to User's *Presubscribed Carrier* Via Direct Route, If Available

USER DIALS
1-703-607-6101

"All Circuits Are Busy, Please Hang-up And Call Later"

GETS Routing

TONE -- Enter PIN 123456789012



GETS Call Processed

Enhanced Routing *and* Priority Treatment

Call Passed to IXC

IXC AT&T

IXC MCIWorldcom

IXC Sprint

AIN

AT

EO

User Dials 1-710-NCS-GETS

IXC AT&T

IXC MCIWorldcom

IXC Sprint

Call in IXC Queue

AT

Call in AT Queue

EO

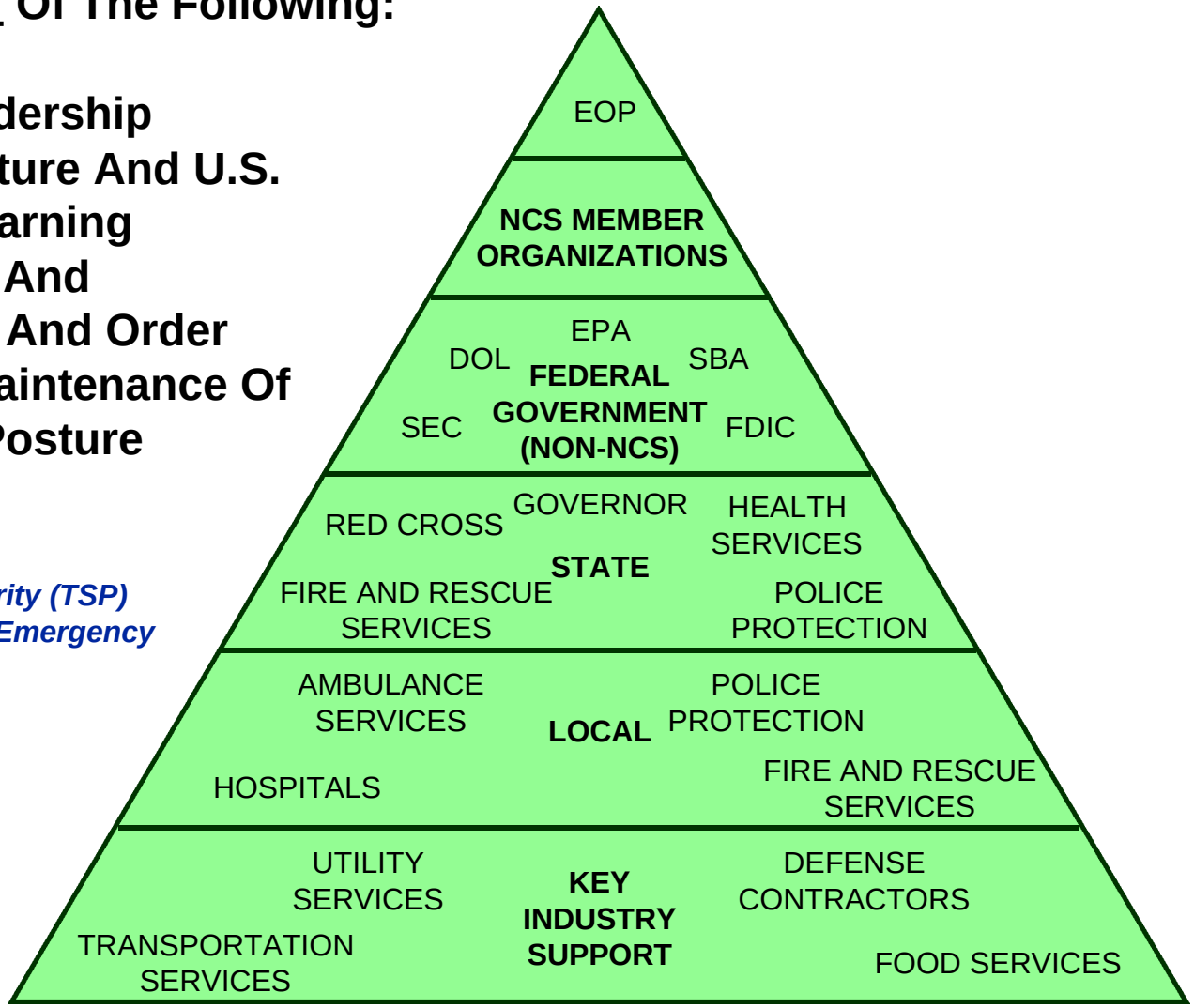
CALL CONNECTED!

NS/EP User Community

If Mission Supports <u>ANY</u> Of The Following:

- ✓ **National Security Leadership**
- ✓ **National Security Posture And U.S. Population Attack Warning**
- ✓ **Public Health, Safety, And Maintenance Of Law And Order**
- ✓ **Public Welfare And Maintenance Of National Economic Posture**

**** Derived from NCS Manual 3-1-1, Telecommunications Service Priority (TSP) System for National Security and Emergency Preparedness (NS/EP) Service User Manual, July 9, 1990***



GETS Card (Front)

Government Emergency Telecommunications Service

1 2 3 4 5 6 7 8 9 0 1 2

Name: JOHN W. GRAVES

Organization: OMNCS - N2

GETS Card (Back)

TO MAKE GETS CALLS

TOUCH-TONE PHONES

Dial **1 + 710-NCS-GETS (627-4387)**
After the tone enter your PIN. When prompted, dial your destination number (Area Code + Telephone Number).

CANNOT COMPLETE

Try a different long-distance carrier by dialing:

For AT&T:	**1010+288**	**+1+710-627-4387**
For MCIW:	**1010+222**	
For Sprint:	**1010+333**	

USERS WITH FTS2000

Use normal procedures to get an FTS2000 dial tone, then dial **710-627-4387**

NEED ASSISTANCE?

Dial **1+800-818-GETS (4387)** to get help or report trouble at any time. You can also obtain user assistance through GETS. When prompted for your destination number dial **703-818-GETS.**

U.S. GOVERNMENT PROPERTY. If found, return to OMNCS (NCS-NP), 701 South Courthouse Road, Arlington, VA 22204-2198. WARNING: For official use only by authorized personnel.

NRC GETS POC

File Search Records Window

POINT OF CONTACT

Last Update 04-NOV-1997

Last Name	RANDALL	Member Org	NRC
First Name	BENJAMIN	Organization	NRC
Title	SR. COMMU SPECIALIST	Password	575757

Primary Phone	301-415-7250	After Hours	301-449-3134	FAX	301-415-5367
Secondary	301-415-7150	Cellular		Pager	800-799-0584
EMail Address				Pager PIN	

PIN Category: ○ Assigned ○ Stockpiled ◉ Both

PIN Status: ◉ Active ○ Deleted ○ Both

Display Data | Close

User List 164

Last Name	First Name	Organization	PIN	PIN Status
		U.S. NRC - REG III	73983859	Active
		U.S. NRC - REG I	96955882	Active
		U.S. NRC - REG I	93018451	Active
		U.S. NRC - REG I	35150271	Active
		U.S. NRC - REG I	22612580	Active

User List - Click twice to view specific information about a user. FLTR NUM

NRC ALT GETS POC

File Search Records Window

GETS USER PIN 06182030 Active Last Update 04-NOV-1997

Last Name	BROWNELL
First Name	BRIAN
Middle Name	D.
Password	
Title	COMMUNICATIONS SPECI
Member Org.	NRC
Organization	U.S. NRC
Address	
City	
State	DC
Zip Code	20555-0001
Country Code	US

Phone Numbers

Primary	301-415-7152	Cellular	
Secondary		Pager	
After Hours	301-595-4449	Pager PIN	

Privileges

○ INT ◉ WZI ○ PDN ○ NT

Note

Point of Contact

RANDALL	BENJAMIN	NRC	NRC

Alternate Point of Contact

BROWNELL	BRIAN	NRC	U.S. NRC

Modify Print Close

Note - Press F2 to edit or begin typing to replace current note FLTR NUM

National Telecommunications Coordinating Network (NTCN)

Mike Lastrina
National Coordinating Center for Telecommunications
703 607-4921 lastrinm@ncs.gov

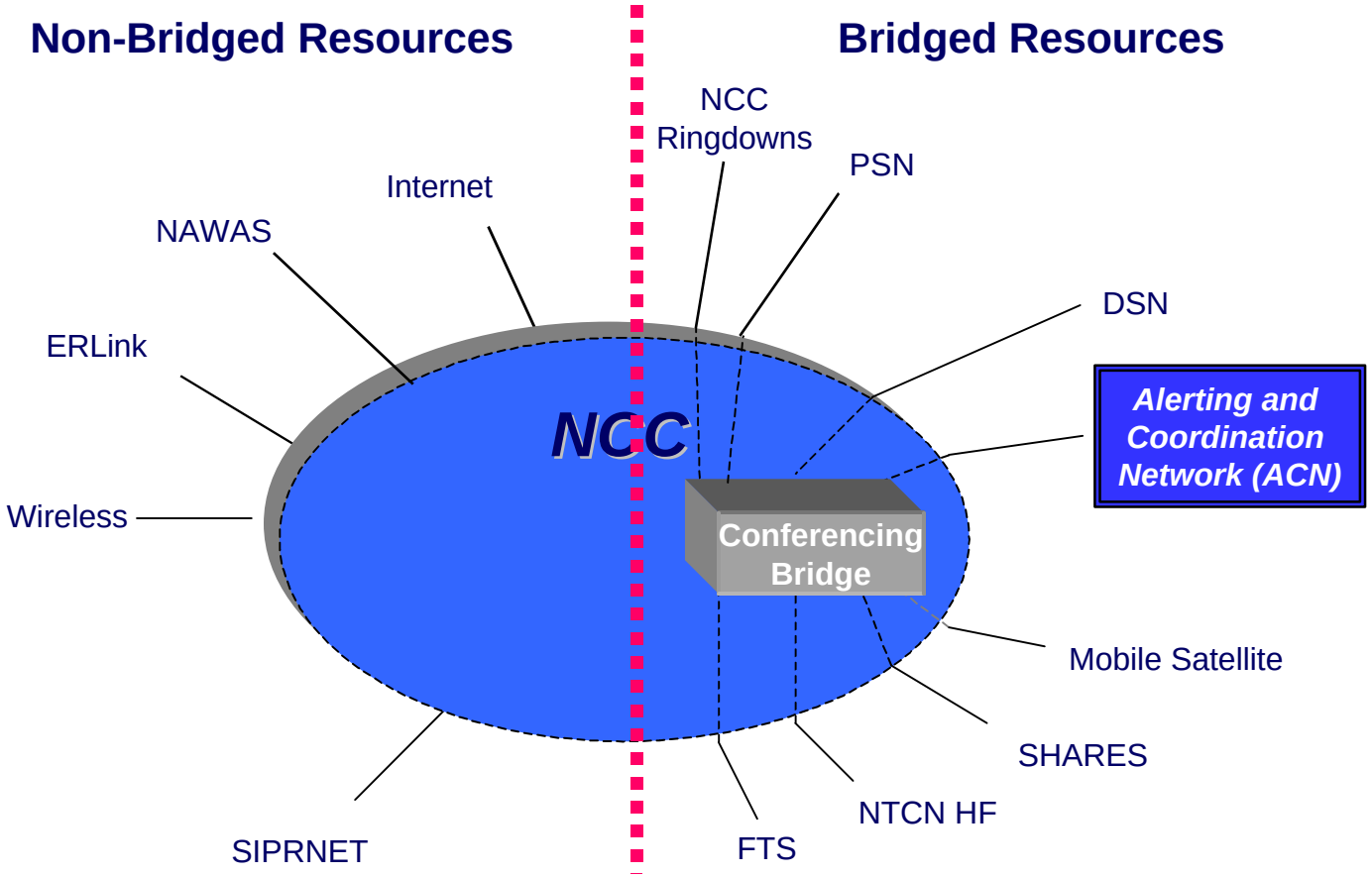
MISSION

To provide timely dissemination of critical information among selected critical Federal Government and telecommunications industry operations centers to support network restoration coordination, the transmission of telecommunications requirements and priorities, and incident reporting when the public network is inoperable, stressed, or congested.

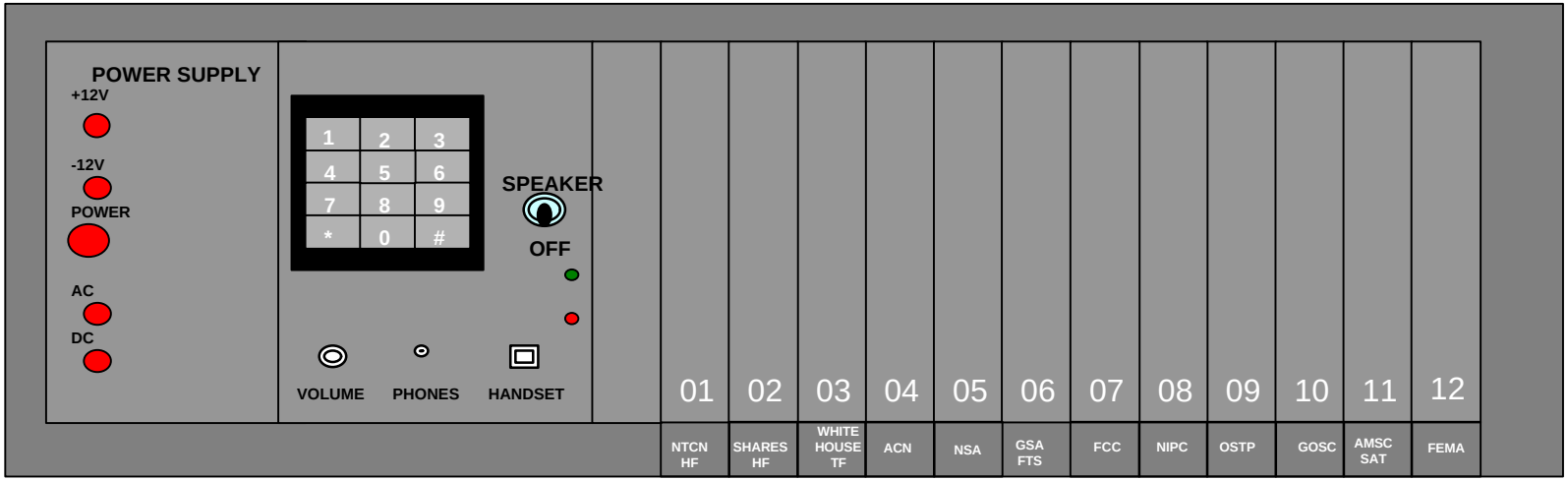
CONCEPT

The NTCN will provide direct communication links between Government departments and agencies (D/A) and telecommunications carriers, vendors, and equipment manufacturers through its two main components, the National Coordinating Center for Telecommunications (NCC) conference bridge and the Alerting and Coordination Network (ACN), which is owned and operated by the National Telecommunications Alliance, Inc. (NTA). These links will ensure the ability for a coordinated Government - industry response during a period when the Public Network (PN) is congested or not available.

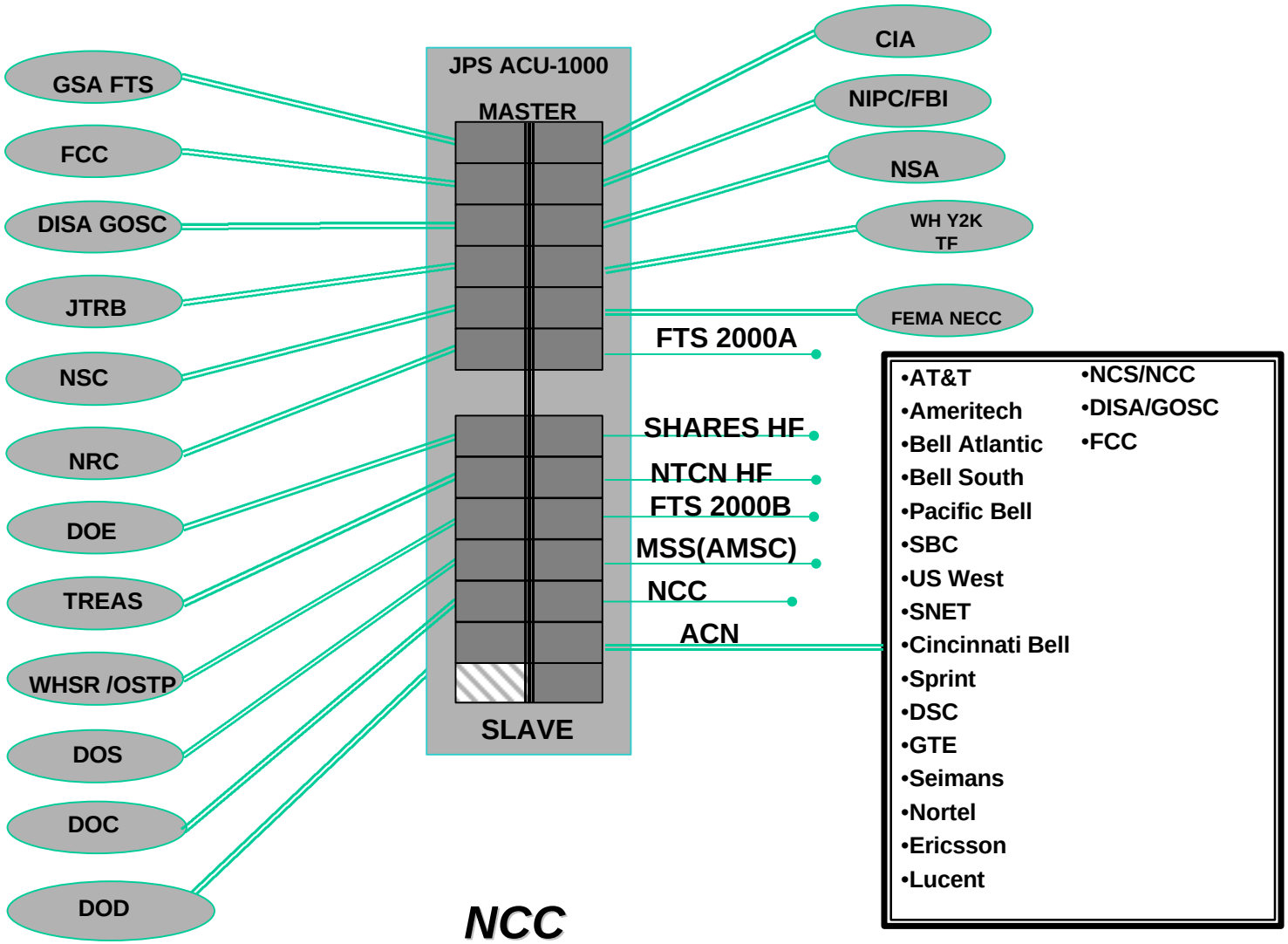
Resource Architecture Concept



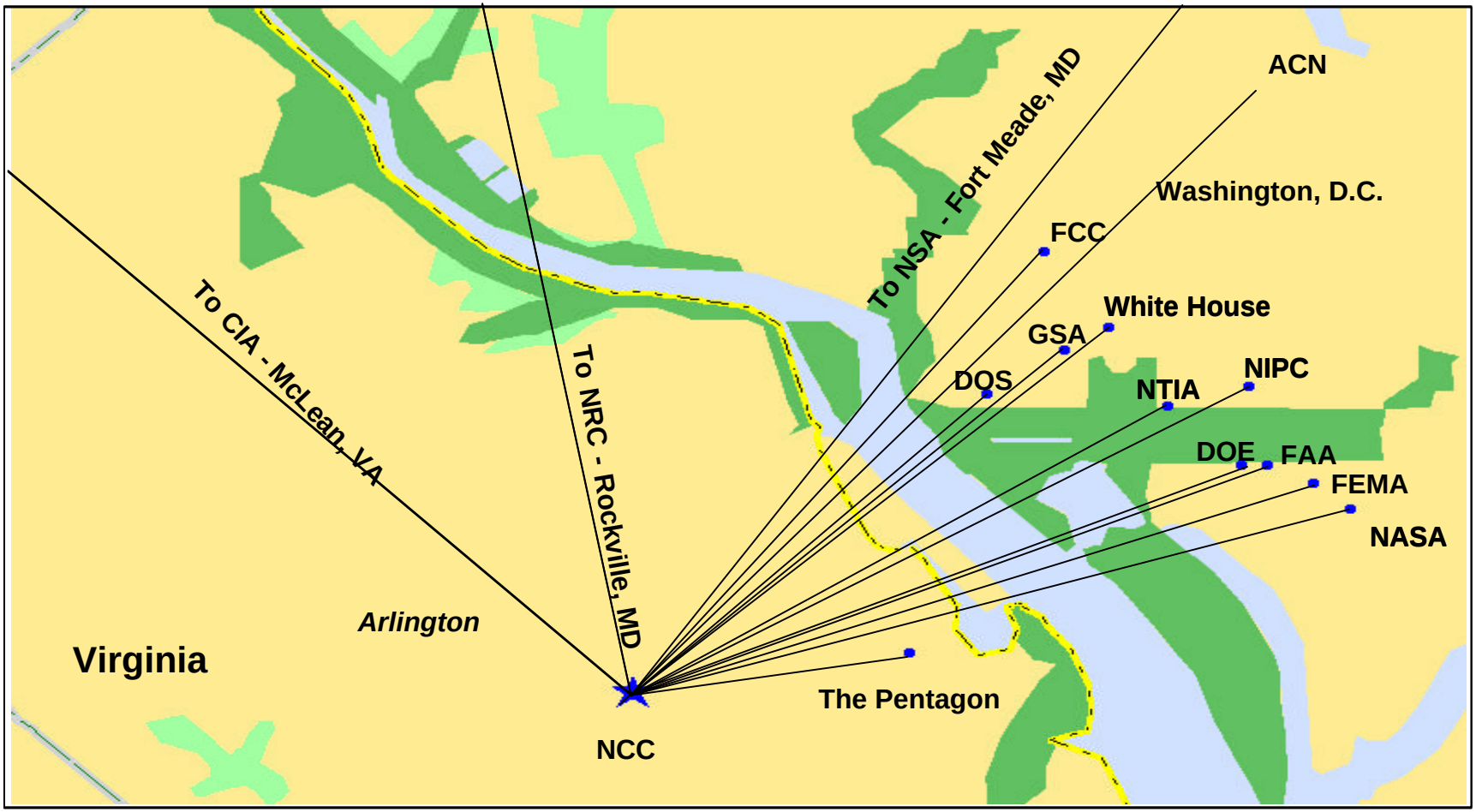
NTCN BRIDGE


POWER SUPPLY
+12V
-12V
POWER
AC
DC
1 2 3
4 5 6
7 8 9
* 0 #
SPEAKER
OFF
VOLUME
PHONES
HANDSET
01 NTCN HF
02 SHARES HF
03 WHITE HOUSE TF
04 ACN
05 NSA
06 GSA FTS
07 FCC
08 NIPC
09 OSTP
10 GOSC
11 AMSC SAT
12 FEMA

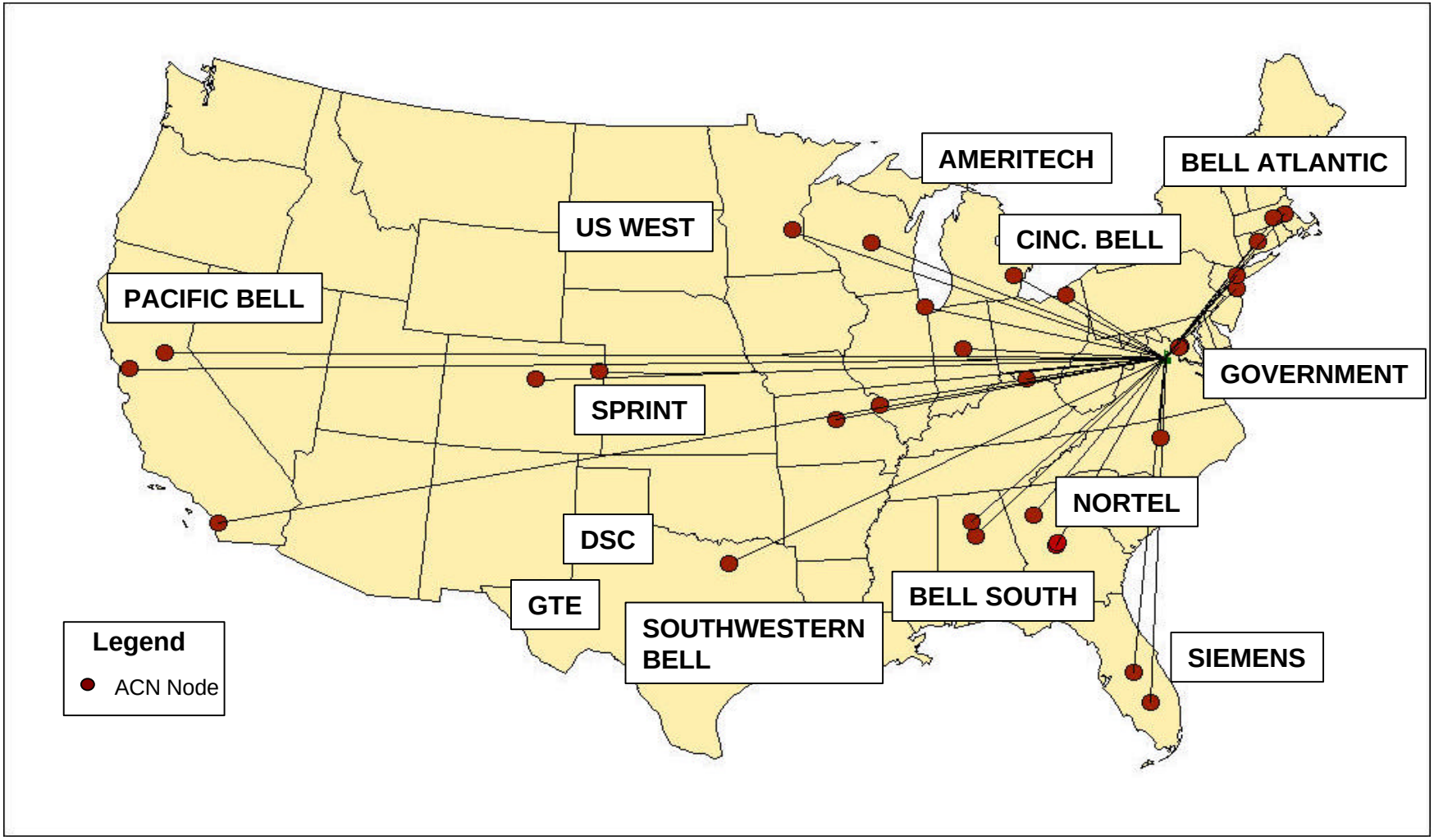
Bridging Architecture Concept



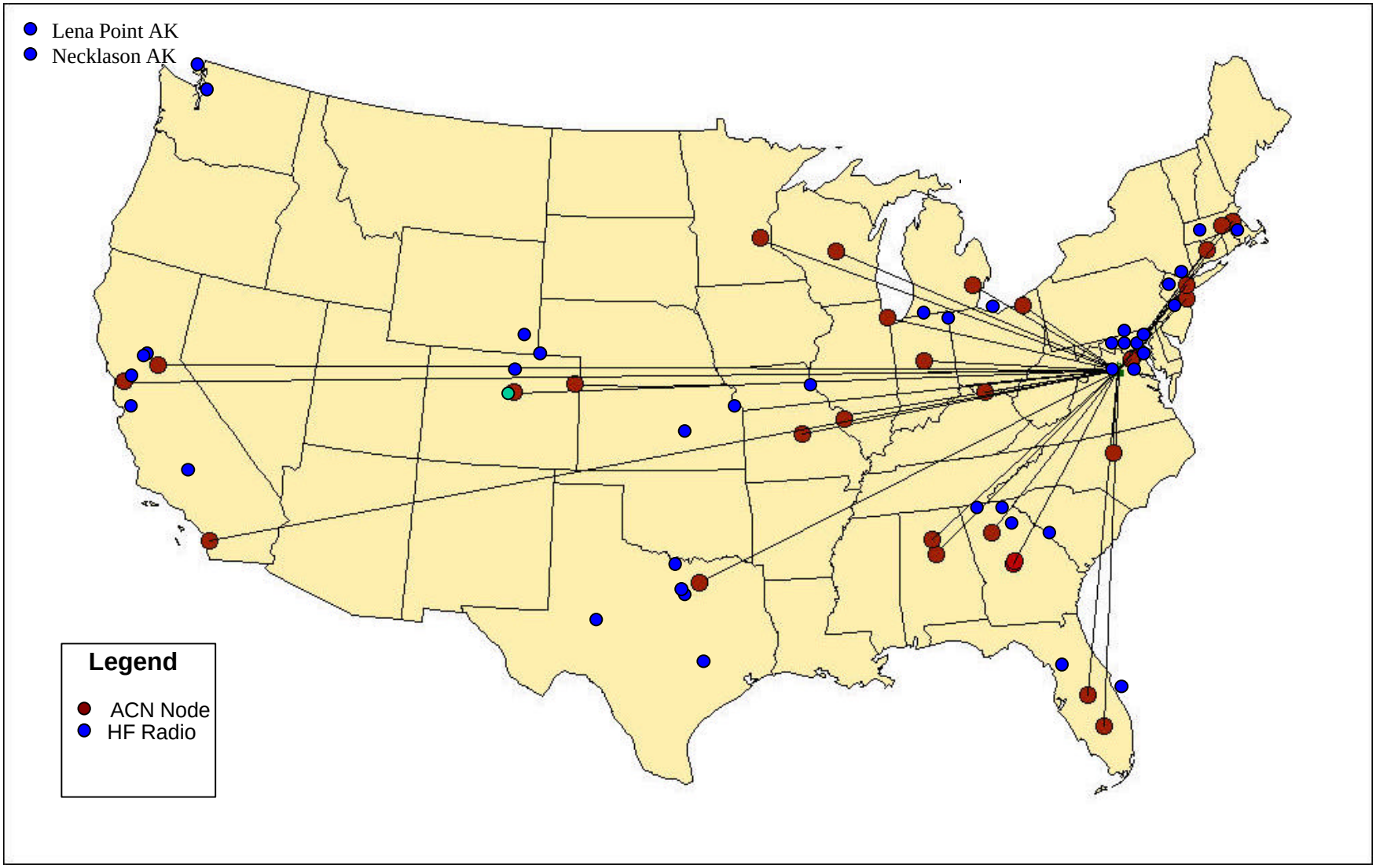
NTCN NCR Topology



ACN Topology



ACN & NTCN High Frequency (HF) Radio Topology



U.S. NUCLEAR REGULATORY COMMISSION
MAJOR Y2K TABLETOP LESSONS LEARNED

As the scenarios were played out by the attendees, scenario issues and lessons learned were created. The scenario lessons learned are as follows:

1. Explore the use of Federal government national security/emergency preparedness telecommunications systems and services, like the National Telecommunications Coordinating Network and the Government Emergency Telecommunications Service, for State and local officials?

   Many Federal NS/EP services are already available to State and local responders. Among these are the Government Emergency Telecommunication Service (GETS), which provides priority access to long distance service, and Telecommunication Service Priority (TSP), which provides high priority restoration of services. For additional information on these services, along with point of contact information, see the NCS web site at www.ncs.gov. Included in this website is information that State and local responders can use to obtain GETS cards.

2. Ensure that satellite-based communication systems relied on in your contingency plan are compatible.

   All satellite-based communications used under the NRC contingency plan will be provided by the same vendor and use the same satellite service (Iridium). Compatibility problems between NRC responders should not be an issue under these circumstances. If licensees use different satellite systems and experience failures of all other telecommunications systems, they may ask the on-site resident inspector to use the NRC satellite phone. Another possibility would be to rely on the bridging capability of the National Telecommunication Coordination Network. Because this capability is limited, however, it is recommended that licensees first ask the resident inspector on-site to use the NRC provided satellite phone, if necessary.

3. Will information from the White House Information Coordination Center be available to county Emergency Operation Centers?

   The NRC will raise the issue of information sharing with State and local EOCs in the discussions of the domestic Interagency Working Group of the President's Y2K Council.

4. In the unlikely event that the NRC Y2K response team has to rely on back-up communication systems, it should be prepared to limit the amount of information requested from the licensee and others since there will be a significantly reduced number of communication channels available.

   Normal NRC response procedures require that information requests be prioritized and controlled. These procedures will be followed during the Y2K response.

5. NRC should ensure that Y2K issues or problems with generic implications are shared with all potentially affected licensees, through the Y2K Early Warning System (YEWS), through owners groups information sharing systems, or through some other information sharing system.

   The NRC will post all known Y2K information associated with U.S. nuclear power plants on YEWS. All nuclear power plant licensees are being offered access to YEWS on a read only

basis. Information on how to get access to YEWS was provided to licensees by means of an Information Notice.

6. NRC should develop a Public Communication Plan for Y2K. Baltimore Gas & Electric has offered to share their plan with the NRC.

   The NRC plan for public communications during the Y2K transition will be developed to supplement the main Federal public information effort which is associated with the White House Information Coordination Center. A draft plan has been prepared.

7. The back-up NRC Operations Center in Region IV (Texas) has very limited emergency power capability. Region IV should explore the feasibility of augmenting the existing emergency power supply.

   Region IV is implementing a plan that will ensure that emergency power is available to meet all of their Incident Response Center needs.

8. NRC headquarters needs to provide Region IV with a list of key Federal, State and licensee contacts.

   This list was provided to the all of the Regions in preparation for the October Y2K exercise.

9. NRC should consider putting copies of licensees Y2K contingency plans for communications in the headquarters operations center and the regional Incident response centers.

   The resident inspectors on-site will have access to the licensees Y2K contingency plans and will be able to share information in those plans with the Y2K response teams in the Regions and at Headquarters.

Incident Response Operations
10/13/1999

U.S. NUCLEAR REGULATORY COMMISSION
Y2K CONTINGENCY PLANNING EXERCISE
15 OCTOBER 1999

Time Line

0600 A small team will monitor the Y2K Early Warning System (YEWS) from the NRC Operations Center. International regulators / operators will voluntarily enter information into YEWS, possibly simulating Y2K problems. Bilateral communication checks with Mexico, Canada and other countries will be performed.

0900 The NRC Operations Center and all of the Regional Incident Response Centers (IRCs) will be staffed in accordance with the Y2K contingency plan.

1000 As the exercise begins the Operations Center clock will be set to midnight at 10:00 a.m.

NRC will perform plant status checks beginning at 10:15 (simulated 0015) for the eastern time zone plants and enter the results of this information into YEWS.

Approximately ten licensees will simulate a situation on-site (from control cells) that will result in a request for enforcement discretion.

Two reactor licensees and one fuel cycle licensee will simulate (from control cells) an emergency on-site. The ET member at Headquarters and the Regional Administrator from the affected Region will decide what response to take. Lead for following one of the three events may be transferred to Region IV. **None of these events is expected to require the Agency to enter Initial Activation**.

Resident inspectors will be located at the licensees control cell. They will call the IRCs and report on any Y2K problems. They will the contact Headquarters Operations Officer if an emergency is declared as part of the exercise.

The ICC team will be in a simulated ICC operations center in the NRC auditorium. They will be kept informed via voice and data links to the Operations Center and the Regions.

1200 Headquarters will simulate a failure that requires Region IV to resume the functions of Headquarters in their back-up role. The Operations Center telephone switch will be transferred to Region IV. (Note: Headquarters Operations Officers stationed in Region IV for the exercise will take actual event reports as well.)

A press conference will be held in the auditorium (mock ICC JPIC). Graduate journalism students will play the role of the media. The press conference will be available for viewing in the Regions via video teleconferencing.

1300 The exercise injects will stop and the exercise will wind down. Lessons learned will be collected from the team players and the independent evaluators.

Exercise Objectives

1. Demonstrate the ability to access and input information into the Y2K Early Warning System (YEWS) and to share this information with nuclear power plant licensees.
2. Demonstrate the ability to simultaneously conduct multiple event-related and enforcement discretion communications within the HQ Operations Center.
3. Demonstrate the ability to identify and compensate for potential Y2K-related failures associated with communications, power, and computer systems within the HQ Operations Center.
4. Demonstrate the ability to conduct vital telephone communications (including at least one Executive Team communication) using a portable, satellite-based telephone system.
5. Demonstrate the ability of the back-up Operations Center (Region IV IRC) to assume vital HQ response functions for at least one hour. This includes receipt of event notifications, event response for one or more events, enforcement discretion communications for one or more facilities, and maintaining communications with NRC staff member(s) in the simulated White House Information Coordination Center (ICC).
6. Demonstrate the ability to conduct timely and accurate agency status briefings in the simulated White House Information Coordination Center (ICC).

Note: Successful completion of these objectives will satisfy several key exercise requirements associated with the NRC Continuity of Operations plan.

Facilities Providing Injects

Region I

Limerick - PECO Energy
Peach Bottom - PECO Energy
Calvert Cliffs - Baltimore Gas & Electric
Seabrook - North Atlantic Energy Services
Hope Creek - Public Service Electric & Gas

Region II

McGuire - Duke Power
Brunswick - Carolina Power & Light

Region III

Dresden - Commonwealth Edison
Byron - Commonwealth Edison
Fermi - Detroit Edison
Paducah GDP - U.S. Enrichment

Region IV

Cooper - Nebraska Public Power District

Headquarters Visitors and Observers For October 15, 1999 Y2K Exercise

Name	Affiliation
Steve Zane	OIG/NRC
Ren Kelley	OIG/NRC
Serge Roudier	France (assigned to IOLB/NRR)
Jean-Yves Henry	IPSN, France
Pascal Regnier	IPSN, France
Elizabeth Besenyei	Hungry
Radka Prochazova	Czech Republic
Jana Micankova	Slovak Republic
Jim Davis	Nuclear Energy Institute
Patricia Bryant	Nuclear Energy Institute
Pat Tenorio	FEMA
Ted Watts	DOE

U.S. NUCLEAR REGULATORY COMMISSION
15 OCTOBER 1999 Y2K EXERCISE
LESSONS LEARNED

As the scenarios were played out by the attendees, scenario issues and lessons learned were created. The scenario lessons learned are as follows:

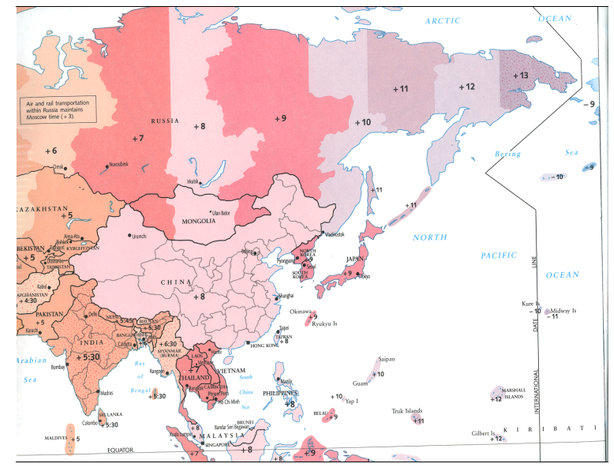
Question: What are some of the more significant lessons learned from the October 15 Y2K exercise?

Answer: Although the exercise was highly successful, several valuable lessons were learned which will allow the NRC to further improve its high state of readiness:

- To date, the Y2K contingency planning procedures have focused on Y2K response team that will be in place as the Y2K transition occurs in the United States. More effort is necessary to fully prepare the earlier team that will be monitoring the Y2K problems overseas. This should include working closer with our Federal partners, including the Department of State (DOS), the Environmental Protection Agency (EPA), and the Department of Energy (DOE) to coordinate the Federal government's response to a problem at a nuclear facility outside of the United States. Additional planning and training sessions are being planned to ensure that the earlier team is fully prepared to respond to potential problems overseas. Representatives from DOS, EPA, and DOE will be invited to participate in these sessions.
- Although NRC Region IV in Arlington, Texas was successful in their back-up role to Headquarters, the telecommunication systems in the regional office were not optimized to handle the volume of calls they ultimately received. The telecommunication systems in Region IV will be upgraded, as necessary, to ensure that Region IV will have capabilities functionally equivalent to those available at NRC headquarters.
- The Y2K Early Warning System (YEWS), developed by NRC, was used successfully during the exercise by the NRC and its regulatory counterparts in twelve other countries. This was the first time the system was used extensively in an exercise environment. Consequently, a number of constructive suggestions have been made for how the system can be improved. For example, a modified report entry is shown as a separate report, which can cause confusion. NRC plans on improving YEWS to address comments received as a result of the exercise. Most NRC nuclear power plant licensees have access to YEWS information on a read-only basis.
- The NRC established a mock White House Information Coordination Center (ICC) cell in the NRC auditorium and conducted briefings to graduate journalism students playing the role of the media. However, there were instances where the procedures for the NRC ICC team were incomplete. For example, the ICC team procedures did not include instructions for contacting Region IV once headquarters was no longer in the lead. These procedures will be completed as more information regarding the ICC becomes available. NRC is participating in ICC exercises on November 3 and December 8.
- A number of recommendations were made on how to enhance the flow of information to the senior NRC decision-makers. One suggestion was to increase the number of satellite phones available to the senior decision makers in the headquarters Operations Center. These recommendations are currently being pursued.

Incident Response Operations
10/19/1999

Global Y2K Transition Period at Operating Nuclear Power Plants vs. Eastern Standard Time and UTC/GMT



Office of International Programs

| | | |

YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-8	United States	BWR	WNP 2	1107	GE (General Electric)
		FF	Siemens Power Corporation	0	Siemens
		PWR	Diablo Canyon 1	1073	Westinghouse
			Diablo Canyon 2	1087	Westinghouse
			San Onofre 2	1070	C-E (Combustion Engineering)
			San Onofre 3	1080	C-E (Combustion Engineering)

AGR: advanced gas-cooled reactor, BWR: boiling water reactor, CNV: conversion facility, ENR: enrichment facility, FF: fuel fabrication facility, FBR: fast breeder reactor, GCR: gas-cooled reactor, HWLWR: heavy-water/light-water reactor, LAB: laboratory, LGR: light-water-cooled, graphite-moderated reactor, LWBR: light-water breeder reactor, MIX: mixed site, PHWR: pressurized heavy-water reactor (e.g. CANDU), PWR: pressurized (light-) water reactor, REP: reprocessing facility, RL: radiological laboratory, RR: research reactor, STO: storage facility

YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-7	United States	PWR	Palo Verde 1	1270	C-E (Combustion Engineering)
			Palo Verde 2	1270	C-E (Combustion Engineering)
			Palo Verde 3	1270	C-E (Combustion Engineering)

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-6	Mexico	BWR	Laguna Verde 1	654	GE (General Electric)
			Laguna Verde 2	654	GE (General Electric)
	United States		Browns Ferry 2	1065	GE (General Electric)
			Browns Ferry 3	1065	GE (General Electric)
			Clinton 1	930	GE (General Electric)
			Cooper 1	778	GE (General Electric)
			Dresden 2	772	GE (General Electric)
			Dresden 3	773	GE (General Electric)
			Duane Arnold	528	GE (General Electric)
			Grand Gulf 1	1173	GE (General Electric)
			LaSalle 1	1048	GE (General Electric)
			LaSalle 2	1048	GE (General Electric)
			Limerick 1	1055	GE (General Electric)
			Limerick 2	1115	GE (General Electric)
			Monticello	544	GE (General Electric)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-6	United States	BWR	Quad Cities 1	769	GE (General Electric)
			Quad Cities 2	769	GE (General Electric)
			River Bend 1	936	GE (General Electric)
		CNV	AlliedSignal Inc.	0	Allied Signal
		FF	ABB Combustion Engineering Inc.	0	ABB
		PWR	Arkansas Nuclear 1	836	B&W (Babcock & Wilcox)
			Arkansas Nuclear 2	858	C-E (Combustion Engineering)
			Braidwood 1	1090	Westinghouse
			Braidwood 2	1090	Westinghouse
			Byron 1	1120	Westinghouse
			Byron 2	1120	Westinghouse
			Callaway 1	1125	Westinghouse
			Comanche Peak 1	1150	Westinghouse
			Comanche Peak 2	1150	Westinghouse
			Fort Calhoun 1	476	C-E (Combustion Engineering)
			Joseph M. Farley 1	815	Westinghouse

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-6	United States	PWR	Joseph M. Farley 2	825	Westinghouse
			Kewaunee	526	Westinghouse
			Point Beach 1	493	Westinghouse
			Point Beach 2	441	Westinghouse
			Prairie Island 1	514	Westinghouse
			Prairie Island 2	513	Westinghouse
			South Texas 1	1251	Westinghouse
			South Texas 2	1251	Westinghouse
			Waterford 3	1075	C-E (Combustion Engineering)
			Wolf Creek	1167	Westinghouse

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	Canada	PHWR	Bruce 1	848	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Bruce 3	848	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Bruce 4	848	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Bruce 5	860	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Bruce 6	860	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Bruce 7	860	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Bruce 8	860	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Darlington 1	881	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Darlington 2	881	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	Canada	PHWR	Darlington 3	881	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Darlington 4	881	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Gentilly 2	635	AECL (Atomic Energy of Canada Ltd.)
			Pickering 1	515	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Pickering 2	515	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Pickering 3	515	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Pickering 4	515	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Pickering 5	516	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Pickering 6	516	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
			Pickering 7	516	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	Canada	PHWR	Pickering 8	516	OH/AECL (Ontario Hydro/Atomic Energy of Canada Ltd.)
	United States	BWR	Brunswick 1	767	GE (General Electric)
			Brunswick 2	754	GE (General Electric)
			Fermi 2	1100	GE (General Electric)
			Hatch 1	759	GE (General Electric)
			Hatch 2	813	GE (General Electric)
			Hope Creek 1	1031	GE (General Electric)
			James Fitzpatrick 1	800	GE (General Electric)
			Nine Mile Point 1	617	GE (General Electric)
			Nine Mile Point 2	1026	GE (General Electric)
			Oyster Creek 1	619	GE (General Electric)
			Peach Bottom 2	1093	GE (General Electric)
			Peach Bottom 3	1093	GE (General Electric)
			Perry 1	1169	GE (General Electric)
			Pilgrim 1	669	GE (General Electric)
			Susquehanna 1	1090	GE (General Electric)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	United States	BWR	Susquehanna 2	1094	GE (General Electric)
			Vermont Yankee 1	496	GE (General Electric)
		ENR	Paducah Gaseous Diffusion Plant	0	N/A
			Portsmouth Gaseous Diffusion Plant	0	N/A
		FF	BWX Technologies, Inc	0	BWX
			Framatome Cogema Fuels	0	Framatome
			General Electric Nuclear Energy	0	GE
			Nuclear Fuel Services, Inc.	0	NFS
			Westinghouse Comm. Nucl. Fuel Div.	0	Westinghouse
		PWR	Beaver Valley 1	810	Westinghouse
			Beaver Valley 2	820	Westinghouse
			Calvert Cliffs 1	835	C-E (Combustion Engineering)
			Calvert Cliffs 2	840	C-E (Combustion Engineering)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	United States	PWR	Catawba 1	1129	Westinghouse
			Catawba 2	1129	Westinghouse
			Crystal River 3	812	B&W (Babcock & Wilcox)
			Davis Besse 1	873	B&W (Babcock & Wilcox)
			Donald C. Cook 1	1000	Westinghouse
			Donald C. Cook 2	1060	Westinghouse
			H.B. Robinson 2	683	Westinghouse
			Indian Point 2	931	Westinghouse
			Indian Point 3	980	Westinghouse
			McGuire 1	1129	Westinghouse
			McGuire 2	1129	Westinghouse
			Millstone 2	873	C-E (Combustion Engineering)
			Millstone 3	1120	Westinghouse
			North Anna 1	893	Westinghouse
			North Anna 2	897	Westinghouse
			Oconee 1	846	B&W (Babcock & Wilcox)
			Oconee 2	846	B&W (Babcock & Wilcox)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	United States	PWR	Oconee 3	846	B&W (Babcock & Wilcox)
			Palisades	762	C-E (Combustion Engineering)
			Robert E. Ginna	470	Westinghouse
			Salem 1	1106	Westinghouse
			Salem 2	1106	Westinghouse
			Seabrook 1	1155	Westinghouse
			Sequoyah 1	1111	Westinghouse
			Sequoyah 2	1106	Westinghouse
			Shearon Harris 1	860	Westinghouse
			St Lucie 1	839	C-E (Combustion Engineering)
			St Lucie 2	839	C-E (Combustion Engineering)
			Summer 1	885	Westinghouse
			Surry 1	801	Westinghouse
			Surry 2	801	Westinghouse
			Three Mile Island 1	786	B&W (Babcock & Wilcox)
			Turkey Point 3	666	Westinghouse
			Turkey Point 4	666	Westinghouse

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Time Zone	Country	Type	FacilityName	MWe	Supplier
-5	United States	PWR	Vogtle 1	1164	Westinghouse
			Vogtle 2	1164	Westinghouse
			Watts Bar 1	1170	Westinghouse

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-4	Canada	PHWR	Point Lepreau	635	AECL (Atomic Energy of Canada Ltd.)

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-3	Argentina	PHWR	Atucha 1	335	Siemens
			Embalse	600	AECL (Atomic Energy of Canada Ltd.)

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
-2	Brazil	PWR	Angra 1	626	Westinghouse

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
0	Portugal	RR	RPI	0	N/A
	United Kingdom	AGR	Dungeness B1	555	APC (Atomic Power Construction Ltd.)
			Dungeness B2	555	APC (Atomic Power Construction Ltd.)
			Hartlepool A1	605	NPC (Nuclear Power Company, Ltd.)
			Hartlepool A2	605	NPC (Nuclear Power Company, Ltd.)
			Heysham A1	575	NPC (Nuclear Power Company, Ltd.)
			Heysham A2	575	NPC (Nuclear Power Company, Ltd.)
			Heysham B1	625	NPC (Nuclear Power Company, Ltd.)
			Heysham B2	625	NPC (Nuclear Power Company, Ltd.)
			Hinkley Point B1	610	TNPG (The Nuclear Power Group)
			Hinkley Point B2	610	TNPG (The Nuclear Power Group)
			Hunterston B1	595	TNPG (The Nuclear Power Group)
			Hunterston B2	595	TNPG (The Nuclear Power Group)
			Torness 1	625	NNC (National Nuclear Corp.)
			Torness 2	625	NNC (National Nuclear Corp.)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
0	United Kingdom	ENR	Capenhurst	0	BNFL
		FF	Springfield Works	0	BNFL
		GCR	Bradwell 1	123	TNPG (The Nuclear Power Group)
			Bradwell 2	123	TNPG (The Nuclear Power Group)
			Calder Hall 1	50	UKAE (United Kingdom Atomic Energy Authority)
			Calder Hall 2	50	UKAE (United Kingdom Atomic Energy Authority)
			Calder Hall 3	50	UKAE (United Kingdom Atomic Energy Authority)
			Calder Hall 4	50	UKAE (United Kingdom Atomic Energy Authority)
			Chapelcross 1	50	UKAE (United Kingdom Atomic Energy Authority)
			Chapelcross 2	50	UKAE (United Kingdom Atomic Energy Authority)
			Chapelcross 3	50	UKAE (United Kingdom Atomic Energy Authority)
			Chapelcross 4	50	UKAE (United Kingdom Atomic Energy Authority)
			Dungeness A1	220	TNPG (The Nuclear Power Group)
			Dungeness A2	220	TNPG (The Nuclear Power Group)
			Hinkley Point A1	235	EBT (English Electric Co. Ltd./Babcock and Wilcox Co./Taylor WoodrowConstruction Co.)
			Hinkley Point A2	235	EBT (English Electric Co. Ltd./Babcock and Wilcox Co./Taylor WoodrowConstruction Co.)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
0	United Kingdom	GCR	Oldbury 1	217	TNPG (The Nuclear Power Group)
			Oldbury 2	217	TNPG (The Nuclear Power Group)
			Sizewell A1	210	EBT (English Electric Co. Ltd./Babcock and Wilcox Co./Taylor WoodrowConstruction Co.)
			Sizewell A2	210	EBT (English Electric Co. Ltd./Babcock and Wilcox Co./Taylor WoodrowConstruction Co.)
			Wylfa 1	475	EBT (English Electric Co. Ltd./Babcock and Wilcox Co./Taylor WoodrowConstruction Co.)
			Wylfa 2	475	EBT (English Electric Co. Ltd./Babcock and Wilcox Co./Taylor WoodrowConstruction Co.)
		LAB	Amersham Laboratories	0	Nycomed Amersham plc
			Cardiff Laboratories	0	Nycomed Amersham plc
			Harwell Laboratory	0	UKAEA
			Isotope Production Unit	0	Nycomed Amersham plc
		MIX	Sellafield	0	BNFL
		PWR	Sizewell B	1188	PPP (PWR Power Projects)
		RR	Consort Reactor	0	N/A
			Raynesway	0	N/A

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Time Zone	Country	Type	FacilityName	MWe	Supplier
0	United Kingdom	RR	Scottish Universities Res. Reactor	0	University of Glasgow
			Triga Reactor	0	ICI Chemicals & Polymers Ltd
		STO	Dounreay Licensed Nuclear Site	0	UKAEA
			Drigg Storage Site	0	BNFL
			Windscale Nuclear Licensed Site	0	UKAEA
			Winfrith Technology Centre	0	UKAEA

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
1	Austria	RR	ASTRA	0	N/A
			TRIGA II	0	N/A
	Belgium	PWR	Doel 1	392	ACW (Ateliers de Constructions Electriques de Charleroi SA/Cockerill/Westinghouse)
			Doel 2	392	ACW (Ateliers de Constructions Electriques de Charleroi SA/Cockerill/Westinghouse)
			Doel 3	1006	Framatome/ACEC Cockerill/Westinghouse
			Doel 4	985	ACW (Ateliers de Constructions Electriques de Charleroi SA/Cockerill/Westinghouse)
			Tihange 1	962	ACLF (Ateliers de Constructions Electriques de Charleroi SA/Creusot-Loire/Framatome)
			Tihange 2	960	Framatome/ACEC Cockerill/Westinghouse
			Tihange 3	1015	ACW (Ateliers de Constructions Electriques de Charleroi SA/Cockerill/Westinghouse)
		RR	BR-2	0	N/A
	Czech Republic	PWR	Dukovany 1	412	Skoda
			Dukovany 2	412	Skoda

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	Czech Republic	PWR	Dukovany 3	412	Skoda
			Dukovany 4	412	Skoda
	France	CNV	CISBIO	0	N/A
			COMHUREX	0	N/A
			TU5	0	N/A
		ENR	EURODIF	0	N/A
		FBR	Creys-Malville	1200	NOVA (Novatome NIRA/Nuclear Italina Reattori Avanzati)
			Phenix	233	CNIM (Constructions Navales et Industrielles de la Mediterranee)
		FF	ATPu	0	N/A
			FBFC Romans	0	N/A
			Melox	0	N/A
		PWR	Belleville 1	1310	Framatome
			Belleville 2	1310	Framatome
			Blayais 1	910	Framatome
			Blayais 2	910	Framatome

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	France	PWR	Blayais 3	910	Framatome
			Blayais 4	910	Framatome
			Bugey 2	920	Framatome
			Bugey 3	920	Framatome
			Bugey 4	900	Framatome
			Bugey 5	900	Framatome
			Cattenom 1	1300	Framatome
			Cattenom 2	1300	Framatome
			Cattenom 3	1300	Framatome
			Cattenom 4	1300	Framatome
			Chinon B1	905	Framatome
			Chinon B2	870	Framatome
			Chinon B3	905	Framatome
			Chinon B4	905	Framatome
			Chooz B1	1455	Framatome
			Chooz B2	1455	Framatome
			Civaux 1	1450	Framatome

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	France	PWR	Civaux 2	1450	Framatome
			Cruas 1	915	Framatome
			Cruas 2	915	Framatome
			Cruas 3	880	Framatome
			Cruas 4	880	Framatome
			Dampierre 1	890	Framatome
			Dampierre 2	890	Framatome
			Dampierre 3	890	Framatome
			Dampierre 4	890	Framatome
			Fessenheim 1	880	Framatome
			Fessenheim 2	880	Framatome
			Flamanville 1	1330	Framatome
			Flamanville 2	1330	Framatome
			Golfech 1	1310	Framatome
			Golfech 2	1310	Framatome
			Gravelines 1	910	Framatome
			Gravelines 2	910	Framatome

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	France	PWR	Gravelines 3	910	Framatome
			Gravelines 4	910	Framatome
			Gravelines 5	910	Framatome
			Gravelines 6	910	Framatome
			Nogent 1	1310	Framatome
			Nogent 2	1310	Framatome
			Paluel 1	1330	Framatome
			Paluel 2	1330	Framatome
			Paluel 3	1330	Framatome
			Paluel 4	1330	Framatome
			Penley 1	1330	Framatome
			Penley 2	1330	Framatome
			Saint-Alban 1	1335	Framatome
			Saint-Alban 2	1335	Framatome
			Saint-Laurent B1	915	Framatome
			Saint-Laurent B2	880	Framatome
			Tricastin 1	915	Framatome

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	France	PWR	Tricastin 2	915	Framatome
			Tricastin 3	915	Framatome
			Tricastin 4	915	Framatome
		REP	La HAGUE	0	N/A
		RL	ATALANTE	0	N/A
		RR	ORPHEE	0	N/A
			OSIRIS	0	N/A
			RHF Grenoble	0	N/A
	Germany	BWR	Brunsbüttel (KKB)	771	KWU (Kraftwerk Union)
			Gundremmingen B	1284	KWU (Kraftwerk Union)
			Gundremmingen C	1288	KWU (Kraftwerk Union)
			Isar 1 (KKI)	870	KWU (Kraftwerk Union)
			Krümmel (KKK)	1260	KWU (Kraftwerk Union)
			Philippsburg 1 (KKP)	890	KWU (Kraftwerk Union)
		ENR	URENCO Germany	0	URENCO
		PWR	Biblis A	1167	KWU (Kraftwerk Union)
			Biblis B	1240	KWU (Kraftwerk Union)

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1	Germany	PWR	Brokdorf (KBR)	1440	KWU
			Emsland (KKE)	1290	Siemens/KWU (Siemens/Kraftwerk Union)
			Grafenrheinfeld (KKG)	1275	KWU (Kraftwerk Union)
			Grohnde (KWG)	1360	KWU (Kraftwerk Union)
			Isar 2 (KKI)	1365	Siemens/KWU (Siemens/Kraftwerk Union)
			Mülheim-Kärlich	1219	BBR (B&W (Babcock Brown Boveri)
			Neckarwestheim (GKN) 1	785	KWU (Kraftwerk Union)
			Neckarwestheim (GKN) 2	1269	Siemens/KWU (Siemens/Kraftwerk Union)
			Obrigheim (KWO)	340	Siemens/KWU (Siemens/Kraftwerk Union)
			Philippsburg 2 (KKP)	1358	KWU (Kraftwerk Union)
			Stade (KKS)	640	Siemens/KWU (Siemens/Kraftwerk Union)
			Unterweser (KKU)	1285	KWU (Kraftwerk Union)
	Hungary		Paks 1	430	AEE (Atomenergoproject)
			Paks 2	433	AEE (Atomenergoproject)
			Paks 3	433	AEE (Atomenergoproject)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	Hungary	PWR	Paks 4	433	AEE (Atomenergoproject)
	Netherlands	BWR	Dodewaard	55	GE (General Electric)
		ENR	URENCO Netherlands	0	URENCO
		PWR	Borssele	449	KWU (Kraftwerk Union)
	Slovak Republic		Bohunice 1	408	AEE (Atomenergoproject)
			Bohunice 2	408	AEE (Atomenergoproject)
			Bohunice 3	408	Skoda
			Bohunice 4	408	Skoda
	Slovenia		Krsko	632	Westinghouse
	Spain	BWR	Cofrentes	955	GE (General Electric)
			Santa Maria de Garon	440	GE (General Electric)
		PWR	Almaraz 1	940	Westinghouse
			Almaraz 2	900	Westinghouse
			Asco 1	917	Westinghouse
			Asco 2	936	Westinghouse
			Jose Cabrera 1 (Zorita)	153	Westinghouse
			Trillo 1	1000	KWU (Kraftwerk Union)

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	Spain	PWR	Vandellos 2	966	Westinghouse
	Sweden	BWR	Barsebaeck 1	600	Asea Atom
			Barsebaeck 2	600	Asea Atom
			Forsmark 1	968	Asea Atom
			Forsmark 2	969	Asea Atom
			Forsmark 3	1158	Asea Atom
			Oskarshamn 1	445	Asea Atom
			Oskarshamn 2	605	Asea Atom
			Oskarshamn 3	1160	Asea Atom
			Ringhals 1	830	Asea Atom
		PWR	Ringhals 2	875	Westinghouse
			Ringhals 3	915	Westinghouse
			Ringhals 4	915	Westinghouse
	Switzerland	BWR	Leibstadt	1030	GETSCO (General Electric Technical Services Co.)
			Muehleberg	355	GETSCO (General Electric Technical Services Co.)
		PWR	Beznau 1	365	Westinghouse
			Beznau 2	357	Westinghouse

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Time Zone	Country	Type	FacilityName	MWe	Supplier
1	Switzerland	PWR	Goesgen	970	KWU (Kraftwerk Union)

AGR: advanced gas-cooled reactor, BWR: boiling water reactor, CNV: conversion facility, ENR: enrichment facility, FF: fuel fabrication facility, FBR: fast breeder reactor, GCR: gas-cooled reactor, HWLWR: heavy-water/light-water reactor, LAB: laboratory, LGR: light-water-cooled, graphite-moderated reactor, LWBR: light-water breeder reactor, MIX: mixed site, PHWR: pressurized heavy-water reactor (e.g. CANDU), PWR: pressurized (light-) water reactor, REP: reprocessing facility, RL: radiological laboratory, RR: research reactor, STO: storage facility

YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
2	Bulgaria	PWR	Kozloduy 1	408	AEE (Atomenergoproject)
			Kozloduy 2	408	AEE (Atomenergoproject)
			Kozloduy 3	408	AEE (Atomenergoproject)
			Kozloduy 4	408	AEE (Atomenergoproject)
			Kozloduy 5	953	AEE (Atomenergoproject)
			Kozloduy 6	953	AEE (Atomenergoproject)
	Finland	BWR	Olkiluoto 1	755	Asea Atom
			Olkiluoto 2	710	Asea Atom
		PWR	Loviisa 1	445	AEE (Atomenergoproject)
			Loviisa 2	445	AEE (Atomenergoproject)
	Israel	RR	IRR-1	0	N/A
	Lithuania	LGR	Ignalina 1	1185	Mintyazhmash
			Ignalina 2	1185	Mintyazhmash
	Romania	PHWR	Cernavoda 1	650	AECL (Atomic Energy of Canada Ltd.)
	South Africa	PWR	Koeberg 1	921	Framatome

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Time Zone	Country	Type	FacilityName	MWe	Supplier
2	South Africa	PWR	Koeberg 2	921	Framatome
	Turkey	RR	ITU-TRR Triga Mark II 1	0	N/A
	Ukraine	LGR	Chernobyl 1	725	Mintyazhmash
			Chernobyl 2	925	Mintyazhmash
			Chernobyl 3	925	Mintyazhmash
		PWR	Khmelnitski-1	950	Mintyazhmash
			Rovno 1	363	Mintyazhmash
			Rovno 2	377	Mintyazhmash
			Rovno 3	950	Mintyazhmash
			South Ukraine 1	950	Mintyazhmash
			South Ukraine 2	950	Mintyazhmash
			South Ukraine 3	950	Mintyazhmash
			Zaporozhe 1	950	Mintyazhmash
			Zaporozhe 2	950	Mintyazhmash
			Zaporozhe 3	950	Mintyazhmash
			Zaporozhe 4	950	Mintyazhmash

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Time Zone	Country	Type	FacilityName	MWe	Supplier
2	Ukraine	PWR	Zaporozhe 5	950	Mintyazhmash
			Zaporozhe 6	950	Mintyazhmash

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
3	Russia	LGR	Kursk 1	925	Mintyazhmash
			Kursk 2	925	Mintyazhmash
			Kursk 3	925	Mintyazhmash
			Kursk 4	925	Mintyazhmash
			Leningrad 1	925	Mintyazhmash
			Leningrad 2	925	Mintyazhmash
			Leningrad 3	925	Mintyazhmash
			Leningrad 4	925	Mintyazhmash
			Smolensk 1	925	Mintyazhmash
			Smolensk 2	925	Mintyazhmash
			Smolensk 3	925	Mintyazhmash
		PWR	Balakovo 1	950	Mintyazhmash
			Balakovo 2	950	Mintyazhmash
			Balakovo 3	950	Mintyazhmash
			Balakovo 4	950	Mintyazhmash

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Time Zone	Country	Type	FacilityName	MWe	Supplier
3	Russia	PWR	Kalinin 1	950	Mintyazhmash
			Kalinin 2	950	Mintyazhmash
			Kola 1	411	Mintyazhmash
			Kola 2	411	Mintyazhmash
			Kola 3	411	Mintyazhmash
			Kola 4	411	Mintyazhmash
			Novovoronezh 3	385	Mintyazhmash
			Novovoronezh 4	385	Mintyazhmash
			Novovoronezh 5	950	Mintyazhmash

AGR: advanced gas-cooled reactor, BWR: boiling water reactor, CNV: conversion facility, ENR: enrichment facility, FF: fuel fabrication facility, FBR: fast breeder reactor, GCR: gas-cooled reactor, HWLWR: heavy-water/light-water reactor, LAB: laboratory, LGR: light-water-cooled, graphite-moderated reactor, LWBR: light-water breeder reactor, MIX: mixed site, PHWR: pressurized heavy-water reactor (e.g. CANDU), PWR: pressurized (light-) water reactor, REP: reprocessing facility, RL: radiological laboratory, RR: research reactor, STO: storage facility

YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
4	Armenia	PWR	Medzamor 2	376	AEE (Atomenergoproject)
	Russia		Balakovo 1	950	Mintyazhmash
			Balakovo 2	950	Mintyazhmash
			Balakovo 3	950	Mintyazhmash
			Balakovo 4	950	Mintyazhmash
			Novovoronezh 3	385	Mintyazhmash
			Novovoronezh 4	385	Mintyazhmash
			Novovoronezh 5	950	Mintyazhmash

AGR: advanced gas-cooled reactor, BWR: boiling water reactor, CNV: conversion facility, ENR: enrichment facility, FF: fuel fabrication facility, FBR: fast breeder reactor, GCR: gas-cooled reactor, HWLWR: heavy-water/light-water reactor, LAB: laboratory, LGR: light-water-cooled, graphite-moderated reactor, LWBR: light-water breeder reactor, MIX: mixed site, PHWR: pressurized heavy-water reactor (e.g. CANDU), PWR: pressurized (light-) water reactor, REP: reprocessing facility, RL: radiological laboratory, RR: research reactor, STO: storage facility

YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
5	Pakistan	PHWR	KANUPP	125	GE Canada
		PWR	CHASNUPP	300	China National Nucl. Corp. (Westinghouse design)
	Russia	FBR	Beloyarsky 3 (BN600)	560	Mintyazhmash

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
5.5	India	BWR	Tarapur 1	160	Combustion Engineering, General Electric
			Tarapur 2	160	Combustion Engineering, General Electric
		PHWR	Kaiga 2	220	AEC, L&T, NFC, NPC
			Kakrapara 1	220	AEC, L&T, NFC, NPC
			Kakrapara 2	220	AEC, L&T, NFC, NPC
			Kalpakkam 1	220	AEC, L&T, NFC, NPC
			Kalpakkam 2	220	AEC, L&T, NFC, NPC
			Narora	220	AEC, L&T, NFC, NPC
			Rajastan 1	100	AEC, Atomic Energy of Canada, GE Canada

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
8	China	PWR	Guangdong 1	944	Framatome
			Guangdong 2	944	Framatome
			Qinshan 1	279	CNNC (China National Nuclear Corporation)
	Taiwan	BWR	Chinshan 1	604	GE (General Electric)
			Chinshan 2	604	GE (General Electric)
			Kuosheng 1	948	GE (General Electric)
			Kuosheng 2	948	GE (General Electric)
		PWR	Maanshan 1	890	Westinghouse
			Maanshan 2	890	Westinghouse

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
9	Japan	BWR	Fukushima-Daiichi 1	439	GE (General Electric)
			Fukushima-Daiichi 2	760	GE (General Electric)
			Fukushima-Daiichi 3	760	Toshiba
			Fukushima-Daiichi 4	760	Hitachi
			Fukushima-Daiichi 5	760	Toshiba
			Fukushima-Daiichi 6	1067	GE (General Electric)
			Fukushima-Daini 1	1067	Toshiba
			Fukushima-Daini 2	1067	Hitachi
			Fukushima-Daini 3	1067	Toshiba
			Fukushima-Daini 4	1067	Hitachi
			Hamaoka 1	515	Toshiba
			Hamaoka 2	806	Toshiba
			Hamaoka 3	1056	Toshiba
			Hamaoka 4	1092	Toshiba
			Kashiwazaki Kariwa 1	1067	Toshiba

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Time Zone	Country	Type	FacilityName	MWe	Supplier
9	Japan	BWR	Kashiwazaki Kariwa 2	1067	Toshiba
			Kashiwazaki Kariwa 3	1067	Toshiba
			Kashiwazaki Kariwa 4	1067	Hitachi
			Kashiwazaki Kariwa 5	1067	Hitachi
			Kashiwazaki Kariwa 6	1315	TOS/GE (Toshiba/General Electric)
			Kashiwazaki Kariwa 7	1315	TOS/GE (Toshiba/General Electric)
			Onagawa 1	498	Toshiba
			Onagawa 2	796	Toshiba
			Shika 1	513	Hitachi
			Shimane 1	439	Hitachi
			Shimane 2	791	Hitachi
			Tokai 2	1080	GE (General Electric)
			Tsuruga 1	341	GE (General Electric)
		FBR	Monju	246	Mitsubishi
		HWLWR	Fugen ATR	148	Hitachi
		PWR	Genkai 1	529	Mitsubishi
			Genkai 2	529	Mitsubishi

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Time Zone	Country	Type	FacilityName	MWe	Supplier
9	Japan	PWR	Genkai 3	1127	Mitsubishi
			Genkai 4	1127	Mitsubishi
			Ikata 1	538	Mitsubishi
			Ikata 2	538	Mitsubishi
			Ikata 3	846	Mitsubishi
			Mihama 1	320	Westinghouse
			Mihama 2	470	WEST/MHI (Westinghouse/Mitsubishi)
			Mihama 3	780	Mitsubishi
			Ohi 1	1120	Westinghouse
			Ohi 2	1120	Westinghouse
			Ohi 3	1127	Mitsubishi
			Ohi 4	1127	Mitsubishi
			Sendai 1	846	Mitsubishi
			Sendai 2	846	Mitsubishi
			Takahama 1	780	Westinghouse
			Takahama 2	780	Mitsubishi
			Takahama 3	830	Mitsubishi

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Time Zone	Country	Type	FacilityName	MWe	Supplier
9	Japan	PWR	Takahama 4	830	Mitsubishi
			Tomari 1	550	Mitsubishi
			Tomari 2	550	Mitsubishi
			Tsuruga 2	1115	Mitsubishi
	Korea, South	PHWR	Wolsong 1	629	AECL (Atomic Energy of Canada Ltd.)
			Wolsong 2	700	AECL/HANJUNG/GE
			Wolsong 3	700	AECL/HANJUNG/GE
			Wolsong 4	700	AECL/HANJUNG/GE
		PWR	Kori 1	556	Westinghouse
			Kori 2	605	Westinghouse
			Kori 3	895	Westinghouse
			Kori 4	895	Westinghouse
			Ulchin 1	920	Framatome
			Ulchin 2	920	Framatome
			Ulchin 3	1000	HANJUNG/CE
			Ulchin 4	1000	HANJUNG/CE
			Yonggwang 1	900	Westinghouse

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Time Zone	Country	Type	FacilityName	MWe	Supplier
9	Korea, South	PWR	Yonggwang 2	900	Westinghouse
			Yonggwang 3	950	KHIC/KAE (Korea Heavy Industries & Construction Co./Korea Atomic Energy Research Institite)
			Yonggwang 4	950	KHIC/KAE (Korea Heavy Industries & Construction Co./Korea Atomic Energy Research Institite)

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YEWS: Facilities Listed by Time Zone

Time Zone	Country	Type	FacilityName	MWe	Supplier
12	Russia	LGR	Bilibino A	12	Mintyazhmash
			Bilibino B	12	Mintyazhmash
			Bilibino C	12	Mintyazhmash
			Bilibino D	12	Mintyazhmash

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MEMORANDUM TO: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

February 11, 2000

FROM: William D. Travers **/RA by Frank J. Miraglia Acting For/**
Executive Director for Operations

SUBJECT: STAFF PLANS CONCERNING THE FEDERAL RESPONSE TO THE YEAR 2000 ISSUE DURING THE FEBRUARY 28 TO MARCH 1, 2000, PERIOD

Among the potential problems associated with the Year 2000 (Y2K) is a computing problem associated with the leap year day, February 29, 2000. Attached is the proposed plan for the NRC response to the "leap day" problem. As with the Y2K transition, the White House Information Coordination Center (ICC) has established a staffing schedule for the leap day response. The attached plan addresses NRC staffing requirements to support the national response. This plan provides an effective and efficient response posture which relies, to the maximum extent possible, upon the normal incident response readiness of the NRC.

Attachment: As stated

cc:
SECY
OGC
OCA
OPA
CIO
CFO
IP

Contact: F. Congel, IRO
301-415-7476

PROPOSED STAFF PLANS TO ADDRESS THE “LEAP DAY” PROBLEM

Background:

One of the Y2K computer-related problems is the date-discontinuity problem that potentially could occur at the end of February 28, 2000. Date discontinuity happens when the date, as expressed by the computer system, does not successfully advance during the transition from one particular day to the next. There is a special case associated with the fact that the year 2000 is a leap year. The rules for determining whether a year is a leap year were established by Pope Gregory XIII in 1582, when he modified the Julian Calendar. The rules are:

- Years divisible by four **are** leap years, unless...
- They are also divisible by 100, in which case they **are not** leap years, except...
- Years that are divisible by 400 **are** leap years.

Unfortunately some computer programmers were only aware of the first two rules and assumed that 2000 is not a leap year. Thus, some systems and software applications may be incorrectly programmed with respect to leap-year considerations and have the potential to fail during the transition on February 28- 29 - March 1, 2000 and on December 30- 31, 2000 - January 1, 2001.

Potential impact on NRC licensees:

The Y2K leap-year problem, like other date-discontinuity problems, potentially initiates in any of the many layers which make up software-based systems. The initiators are clocks, operating systems, software modules, libraries, tools, and application software. Any or all these mechanisms are in real-time computer systems and have the potential to fail in different ways. However, like the minor date-discontinuity failures that occurred during the transition from 1999 to 2000, the failures are unlikely to affect the functioning of any systems or embedded components or the ability for operators to obtain information about parameters being monitored.

Steps that industry has taken to address the issue:

NEI/NUSMG 97-07, the guidance document upon which the Y2K readiness programs of all operating nuclear power plants (NPPs) are based, specifically requires testing for leap year, (December 31, 2000) and leap day (February 29, 2000). All licensees have included this leap-year related testing as part of the plant-specific Y2K readiness program implementation. Additionally, all operating NPPs have implemented plant-specific contingency plans for the critical Y2K leap year date of February 29, 2000, should unexpected failures occur.

In response to GL 98-03, all ten of the major fuel cycle facilities reported that they were Y2K Ready. Minor Y2K problems occurred at two fuel cycle facilities after the transition. The reported problems did not compromise safety or safeguards at the two facilities. When asked Y2K questions during routine inspections before the transition, materials licensees reported few challenges preparing for the Y2K transition on December 31, 1999 - January 1, 2000. None of the reported problems involved NRC regulated materials. No Y2K problems have been reported by materials licensees. No Part 21 reports have been made by fuel cycle facilities or materials licensees. No risk-significant Y2K concerns have been identified for NRC regulated material.

NRC assessment of the issue:

Based on our review of responses from the nuclear power industry and fuel cycle facilities concerning Y2K readiness; our independent inspection efforts at all 103 operating NPPs, 10 major fuel cycle facilities, and materials licensees; and our other regulatory oversight activities; the staff concludes that the Y2K problem will not adversely affect the continued safe operation of NPPs, fuel cycle facilities, and materials licensees during the critical Y2K leap-year dates. All operating NPPs, fuel cycle facilities, and materials licensees successfully passed through the primary Y2K critical date transition of December 31, 1999 - January 1, 2000 and have operated safely to date. We have not identified any Y2K problem that may adversely affect operating NPPs', fuel cycle facilities' or materials licensees' ability to continue safe operation or shut down during the upcoming Y2K leap-day transition.

Federal government plans for leap year roll over:

Federal agencies are being asked to staff the Information Coordination Center (ICC) Operations Center and Joint Public Information Center (JPIC) on February 28, 29 and March 1 with the same individuals who staffed the ICC during the Y2K transition. Two seven-hour shifts are planned. The first (day) shift runs from 7:00 a.m. until 2:00 p.m. and the second (night) shift runs from 2:00 p.m until 9:00 p.m.

NRC is under the Energy Sector within the ICC. The Department of Energy, which heads the Energy Sector, does not plan to staff their EOC but will develop the Energy Sector Reports at the ICC. NRC and DOE have coordinated their plans for the leap day rollover, and have worked out a system that will ensure that the Energy Sector status summaries and briefing bullets prepared at the ICC accurately reflect NRC input.

NRC Plans:

NRC will support staffing at the ICC Operations Center on February 28, 29, and March 1 less. However, because media interest in the leap-day transition is expected to be less than during the Y2K transition, the staff does not see the need to have a senior spokesperson or a public affairs representative in the JPIC. However, the public affairs representatives and a senior spokesperson will be on call and available to report to the JPIC, if the need arises.

During the period that the ICC is staffed, a small IRO team will be available in the NRC Operations Center to support the NRC staff at the ICC and to provide reports to the ICC using the Information Collection and Reporting System (used during the Y2K transition). This team will develop the input to the energy sector report and provide it to the NRC representative in the ICC Operations Center. The team will also ascertain circumstances of any reported plant events during the February 28- March 1 period, and their relation to "leap day" so that the agency can appropriately respond to any inquiries.

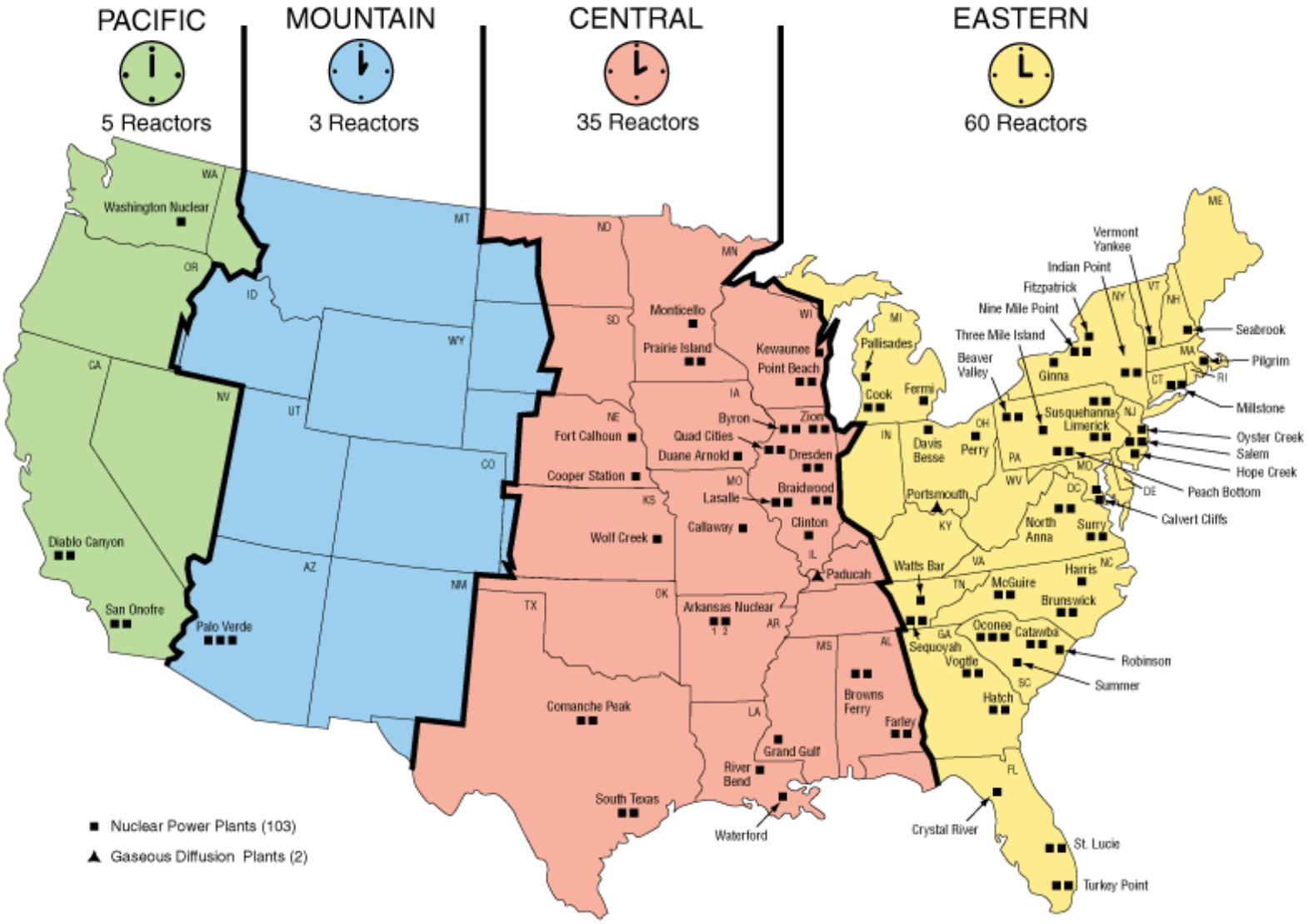
Plant status information will be obtained by the Headquarters Operations Officer shortly after midnight local time on (approximately 12:15 - 1:00 a.m., February 29, 2000). The Y2K Early Warning System (YEWS) will be operational during the leap-day transition and NRC plans to use this system, as appropriate, to notify licensees of potential leap-day problems that are reported. Regulators from other countries have been invited to enter information into YEWS

during the leap day transition. However, international participation in this voluntary system is not expected to be as extensive as it was during the Y2K transition.

The staff does not plan to preposition responders in the Regional Incident Response Centers or to require resident inspectors to be on site during off-normal hours. The staff will rely on resident inspector feedback during regularly scheduled hours and on existing reporting requirements (e.g., 10 CFR 50.72) to receive information on computer problems that occur during the leap-day transition. Based on the experience from the Y2K transition, the staff does not plan to make special provisions for responding to requests for enforcement discretion. However, the staff plans to have appropriate NRR and NMSS managers “on-call” in the unlikely event that significant operational or safety concerns arise because of a leap-day problem.

In the extremely unlikely event that a leap-day problem results in a situation that requires an NRC response, the existing NRC incident response procedures will be followed and additional responders will be called in to the Operations Center and appropriate Regional Incident Response Center.

U.S. OPERATING NUCLEAR FACILITIES BY TIME ZONES



U.S. OPERATING NUCLEAR FACILITIES BY TIME ZONE

PACIFIC TIME	MOUNTAIN TIME	CENTRAL TIME	EASTERN TIME	
Diablo Canyon	Palo Verde	Arkansas	Beaver Valley	*Portsmouth*
San Onofre		Braidwood	Brunswick	Robert Ginna
Wash. Nuclear		Brown's Ferry	Calvert Cliffs	Salem
		Byron	Catawba	Seabrook
		Calloway	Crystal River	Sequoyah
		Clinton	Davis Besse	Shearon Harris
		Comanche Peak	Donald Cook	St. Lucie
		Cooper	Fermi 2	Summer
		Dresden	H.B. Robinson	Surry
		Duane Arnold	Hatch	Susquehanna
		Farley	Hope Creek	Three Mile Island
		Ft. Calhoun	Indian Point	Turkey Point
		Grand Gulf	Fitzpatrick	Vt. Yankee
		Kewaunee	Limerick	Vogtle
		Lasalle	McGuire	Watts Bar
		Monticello	Millstone	
		Paducah	Nine Mile Point	
		Point Beach	North Anna	
		Prairie Island	Oconee	
		Quad Cities	Oyster Creek	
		River Bend	Pallisades	
		South Texas	Peach Bottom	
		Waterford	Perry	
		Wolf Creek	Pilgrim	
TOTAL	**TOTAL**	**TOTAL**	**TOTAL**	
5 Reactors	3 Reactors	35 Reactors	60 Reactors	

		1 *Gaseous Diffusion Plant*	1 *Gaseous Diffusion Plant*

Issue Date: 06/29/1999

NRC INSPECTION MANUAL DLPM

PART 9900: TECHNICAL GUIDANCE

NOED.TG

OPERATIONS - NOTICES OF ENFORCEMENT DISCRETION

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A. PURPOSE

This document provides guidance to staff in the Regional Offices and the Office of Nuclear Reactor Regulation (NRR) on the process for the NRC to exercise enforcement discretion with regard to limiting conditions for operation (LCO) in power reactor Technical Specifications (TS) or other license conditions. This type of discretion is addressed in Section VII.C of the "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy, NUREG-1600) and is designated as a Notice of Enforcement Discretion (NOED). This guidance is not applicable to non-power or permanently shutdown reactors. NOEDs may be warranted for operating reactors if compliance with a TS LCO or with other license condition would involve: (1) an unnecessary plant transient, or (2) performance of testing, inspection, or system realignment that is inappropriate for the specific plant conditions, or (3) unnecessary delays in plant startup without a corresponding health and safety benefit. An NOED can be issued for a power reactor at power, in startup, or in shutdown, provided the specific applicable criteria set forth below are met. NOEDs may also be appropriate when severe weather and other external events could have a potential impact on the overall health and safety of the public.

The NOED process is designed to address temporary nonconformances from the license conditions and TS only, and is not appropriate for nonconformances with regulations, Updated Final Safety Analysis Reports (UFSARs), or codes. Exemptions from regulations, non-compliance with UFSARs, and reliefs from codes must be processed in accordance with the provisions of Title 10 Code of Federal Regulations (10 CFR) 50.12, 50.59 or 50.55a. Nonconformance with regulations, UFSARs, or codes normally do not, in themselves, require immediate shutdown. In such situations, the licensee must perform a prompt safety assessment of the noncompliance and make an appropriate operability determination. The licensee should further determine what other NRC requirements apply to the situation, e.g., 10 CFR Part 50, Appendix B, Criterion XVI, 10 CFR 50.12, etc. and take required actions. Generic Letter (GL) 91-18, "Information to Licensees Regarding NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions," and associated NRC Inspection Manual Chapter Part 9900 provide staff guidance for addressing such circumstances.

When an NOED is granted, it is recognized that the operating license will be violated, but the NRC is exercising its discretion not to enforce compliance with the operating license for a specified time period. In all cases, appropriate enforcement actions consistent with the NRC's Enforcement Policy should be considered for the root causes leading to the need for the NOED.

B. CRITERIA

1.0 General Considerations

A licensee may depart from its TS in an emergency, pursuant to the provisions of 10 CFR 50.54(x), without prior NRC approval, when it must act immediately to protect the public health and safety. However, situations occur occasionally that are not addressed by the provisions of 10 CFR 50.54(x), and for which the NRC's exercise of enforcement discretion may be appropriate. Provided that the licensee has not abused the emergency provisions of 10 CFR 50.91 by failing to apply for an amendment in a timely manner, it is appropriate that the NRC have the NOED procedure for expeditious notice to a licensee of NRC's intention to exercise enforcement discretion under limited circumstances.

The NRC staff is expected to issue NOEDs infrequently. Although requirements may dictate that a plant must be shut down, refueling activities suspended, or plant startup delayed absent the exercise of enforcement discretion, the NRC staff is under no obligation to issue an NOED. The decision to forego enforcement action is discretionary. An NOED is to be issued only if the NRC staff is clearly satisfied that such action is warranted from a public health and safety standpoint. An NOED should be granted on a case-by-case basis, considering the individual plant circumstances. If appropriate and feasible, the staff should perform a qualitative probabilistic risk analysis (PRA) as an input to its decision process. If the NRC decides not to issue an NOED, the licensee must take the action required by the TS (except as stated in 10 CFR 50.54(x)). In addition, if a Licensee Event Report (LER) is required by 10 CFR 50.73 as a result of the non-conformance, the licensee must submit that LER, notwithstanding the staff's issuance of an NOED.

Careful regulatory scrutiny should be given to any deviation from the required actions of the TS or other license conditions for circumstances involving violations, poor planning, repeated NOED requests for the same reasons, or some similarly avoidable situation. To prevent the potential for such abuse, and the lack of up-front public notice and participation in the NOED process, the staff will apply criteria similar to those in 10 CFR 50.91 to verify that the exigency was unavoidable.

2.0 Situations Affecting Radiological safety

The following are NOED criteria applicable for various plant conditions:

1. For an operating plant, the NOED is intended to (a) avoid undesirable transients as a result of forcing compliance with the license condition and, thus, minimize potential safety consequences and operational risks or (b) eliminate testing, inspection, or system realignment that is inappropriate for the particular plant conditions.
2. For plants in a shutdown condition, the NOED is intended to reduce shutdown risk by avoiding testing, inspection, or system realignment that is inappropriate for the particular plant conditions, in that it does not provide an overall safety benefit, or may, in fact, be detrimental to safety in the particular plant condition.

3. For plants attempting to start up,[(1)] the need for an NOED is expected to occur less often than for operating plants, because delaying startup does not usually leave a plant in a condition in which it could experience undesirable transients. Thus, the issuance of NOEDs for plants attempting to start up must meet a higher threshold, as described below. NOEDs for plants attempting to start up are to be exercised only when the licensee considers and the NRC staff has concluded that:
   a. The equipment or system does not perform a safety function in the mode in which operation is to occur (e.g., a TS which requires the equipment to be operable in a mode not required by the UFSAR); or,
   b. The safety function performed by the equipment or system is of only marginal safety benefit, and remaining in the current mode increases the likelihood of an unnecessary plant transient or,
   c. The TS or other license conditions require a test, inspection, or system realignment that is inappropriate for the particular plant conditions, in that it does not provide a safety benefit, or may, in fact, be detrimental to safety in the particular plant condition.

The letter issuing an NOED should specifically address which of the above three criteria were satisfied. If the criteria, as described above, are not satisfied, the licensee must comply with the license requirements until a license amendment is requested and issued.

3.0 Situations Arising from Severe Weather or Other Natural Events

In unusual situations, severe weather or other natural events may result in a government entity or a responsible independent entity making the assessment that the eed for power and immediate overall public (non-radiological) health and safety considerations constitute an emergency situation. The licensee must provide the name, organization and telephone number of the official in the government or independent entity that made the emergency assessment. If deemed necessary, the staff may contact the appropriate official to independently verify the information provided by the licensee prior to making an NOED determination. In such circumstances, the staff may grant an NOED based on balancing the overall public health and safety implications of not operating, with the potential radiological or other hazards associated with continued operation of the facility while in nonconformance with the particular requirement. The request must provide details of the basis and nature of the emergency; its potential consequences such as plant trip, controlled shutdown, delayed startup; the condition and operational status of the plant (equipment out of service or otherwise inoperable); status, and potential challenges to off-site and on-site power sources, and the impact of the emergency on plant safety. The licensee must identify actions that it took to avert and/or alleviate the emergency situation, including steps taken to avoid being in the noncompliance, as well as efforts to minimize grid instabilities (e.g., coordinating with other utilities and the load dispatcher organization for buying additional power or for cycling load, shedding interruptible industrial or non-emergency loads). In addition, the licensee's request must be sufficiently detailed for the staff to evaluate the likelihood that the event could affect the plant, the capability of the ultimate heat sink, on-site and off-site emergency preparedness status, access to and from the plant, acceptability of any increased radiological risk to the public and the overall public benefit.

C. NOED PROCESS

1.0 Regional NOED

A region-issued NOED is appropriate when the noncompliance is nonrecurring, will not exceed 14 days in duration, and a license amendment is not practical because the plant will return to compliance with the existing license in a short period of time. Matters that a region-issued NOED may address include:

1. 1. A noncompliance of short duration with the limits of a function specified in an LCO.
2. 2. A noncompliance with an action statement time limit.
3. 3. A noncompliance with a surveillance interval or a one-time deviation from a surveillance requirement.

The authority to issue an NOED is assigned to the Regional Administrator, who may delegate the authority to the Regional Division Director of Reactor Projects. The NOED should be based on a written request (or in some cases an oral request followed by a written request within 24 hours) from a licensee. Before issuing an NOED, the region should obtain the concurrence of the NRR Project Director (PD). The PD, in turn, should consult with the cognizant NRR technical branch chief(s) concerning the acceptability of issuing the NOED. Whenever a regional NOED is exercised, the staff's evaluation of the licensee's request, including the applicable items in Section C.4 of this guidance, should be documented in a letter to the licensee from the Regional Administrator or his/her designated official. The letter should follow the format and content of Attachment A to this guidance, and specify and discuss the maximum period of time for which the NOED is in effect (not to exceed 14 days). The region may grant an NOED verbally, but this should be followed by written authorization within 2 working days of the verbal NOED authorization. Resolution of the condition that led to the request for enforcement discretion should terminate the NOED. All licensee - staff teleconferences to discuss NOED requests should be made through the NRC headquarter's Emergency Operations Center recorded telephone line (Telephone No. (301) 816-5100). This provides a record of the discussion and a basis for future verification of its consistency with the licensee's follow-up written request.

2.0. NRR NOED

Matters that an NRR-issued NOED may address include:

1. A noncompliance with an element specified in a limiting condition for operation until such time as the element can be revised by a license amendment.
2. A noncompliance with an action statement time limit for which a license amendment will be processed to make the extension either a one-time or a permanent change to the TS.
3. A noncompliance with a surveillance interval or change to a surveillance requirement that will be incorporated by an amendment.

The authority to issue an NOED is delegated to the appropriate PD. The NOED should be based on a written request (or in some cases, an oral request followed by a written request within 24 hours) from a licensee. Before issuing an NOED, the NRR PD should obtain concurrence from the responsible Regional Division Director of Reactor Projects. In addition, the PD should consult with and obtain written concurrence from the appropriate NRR technical branch chiefs. The staff may grant an NOED verbally, but this should be followed by written authorization within 2 working days of the verbal NOED

authorization. All licensee - staff teleconferences to discuss NOED requests should be made through the NRC headquarter's Emergency Operations Center recorded telephone line (Telephone No. (301) 816-5100). This provides a record of the discussion and a basis for verification of its consistency with the licensee's follow-up written request. Whenever an NRR NOED is granted, the staff's evaluation of the licensee's request, including the applicable items in Section C.4 of this guidance, should be documented in a letter to the licensee from the appropriate NRR PD. The letter should specify and discuss the maximum period of time for which the NOED is in effect (resolution of the condition that led to the request or issuance of the follow-up license amendment would return the licensee to a condition of compliance with the license), and should follow the format and content of Attachment A to this guidance. Follow-up license amendments for NRR-issued NOEDs should be processed on an exigent basis in accordance with the process for exigent amendments. The follow-up license amendment must be submitted by the licensee within 48 hours of its oral request and should be issued by the NRC staff within 4 weeks of the issuance of the NOED unless otherwise justified by any special circumstances. Such special circumstances should be documented promptly in a memorandum from the responsible PD to the Associate Director for Project Licensing and Technical Analysis. If necessary, an NOED-related issue that is part of a larger license amendment request should be handled as a separate amendment if that will expedite issuance. When amendments involving NOEDs are issued, the transmittal letter should identify the NOED which the amendment supersedes. Also, the NRR Project Manager (PM) should send an electronic copy of the letter issuing the follow-up license amendment to the E-mail address: NOED.

NRR is responsible for NOEDs involving severe weather conditions or other natural events. NRR has the lead for staff determination of the validity of the emergency and whether to grant an NOED. The PM, with assistance from appropriate technical staff, should make reasonable efforts to get a good assessment of the nature of the emergency. A teleconference should be held as soon as possible among senior licensee management, NRR and regional staffs. Participating staff personnel should include: NRR - PM, PD, cognizant technical branch chiefs, including the chief of the Electrical and Instrumentation and Controls branch, if possible, to evaluate the emergency assessment; Regional Projects Division Director, and Resident Inspector. Following the teleconference the licensee must immediately submit (within a few hours) a follow-up written request documenting all the bases, justifications, commitments and other considerations and conditions discussed and agreed upon in the teleconference. The PM should inform the Commission through the cognizant Regional Coordinator, OEDO, as expeditiously as possible following granting of the NOED. See Attachment B for a sample memorandum from the OEDO to the Commission. The cognizant PM should prepare this memorandum in draft and give it to the cognizant Regional Coordinator, OEDO, for finalization and processing.

3.0 Multiple NOEDs

There may be occasions when several plants in different regions may request NOEDs simultaneously to address common conditions, e.g, a vendor advisory letter. In such cases, the regions and NRR should coordinate closely with each other to avoid potential duplication of effort and/or inconsistent approaches and to obtain any special assistance or expertise needed from NRR. In such cases, plant-specific NOEDs will be issued, either by the region or NRR, in accordance with Sections C.1 and C.2 of this guidance, to individual licensees. To assure consistency in staff determinations relating to the NOED requests, approvals, root cause violations and enforcement actions, the cognizant NRR technical branch chief(s) should be included in all discussions and decisions.

4.0. Request for NOED

The staff should verify that the licensee's request for an NOED includes the following:

1. The TS or other license conditions that will be violated.
2. The circumstances surrounding the situation, including apparent root causes, the need for prompt action and identification of any relevant historical events.
3. The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action. This evaluation should include at least a qualitative risk assessment derived from the licensee's PRA.
4. The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public health and safety and that no significant hazard consideration is involved.
5. The basis for the licensee's conclusion that the noncompliance will not involve adverse consequences to the environment.
6. Any proposed compensatory measure(s).
7. The justification for the duration of the noncompliance.
8. A statement that the request has been approved by the facility organization that normally reviews safety issues (Plant On-site Review Committee, or its equivalent).
9. The request must specifically address which of the NOED criteria for appropriate plant conditions specified in Section B is satisfied and how it is satisfied.
10. If a follow-up license amendment is required, the NOED request must include marked-up TS pages showing the proposed TS changes and a commitment to submit the actual license amendment request within 48 hours.
11. For NOEDs involving severe weather or other natural events, the licensee's request must be sufficiently detailed for the staff to evaluate the likelihood that the event could affect the plant, the capability of the ultimate heat sink, on-site and off-site emergency preparedness status, access to and from the plant, acceptability of any increased radiological risk to the public and the overall public benefit. In addition to items 1-10 above, as appropriate, the licensee must provide:
    a. Details of the basis and nature of the emergency; potential consequences of forced compliance with the license conditions to the plant and to exacerbation of the emergency situation. The licensee must provide the name, organization and telephone number of the official that made the emergency assessment
    b. Status, and potential challenges to off-site and on-site power sources, and the impact of the emergency on plant safety.
    c. Demonstrated actions taken to avert and/or alleviate the emergency situation, including steps taken to avoid being in the noncompliance, as well as efforts to minimize grid instabilities (e.g., coordinating with other utilities and the load dispatcher organization for buying additional power or for cycling load, shedding interruptible industrial or non-emergency loads).

The request from the licensee should normally be sent by facsimile to the NRR PD and the Regional Projects Division Director. The signed original should be sent to the Document Control Desk. However, if circumstances do not permit time for the written request to be prepared and sent to the NRC, the licensee may make the request orally, describing to the best of its ability the information required by the staff. The licensee's oral request needs to be followed promptly by written documentation (within 24 hours) addressing the appropriate items listed above. In cases where a license amendment is appropriate, the written request for the NOED should be followed within 48 hours by the licensee's request for a

license amendment for NRC staff consideration under the provisions of 10 CFR 50.91. The licensee's amendment request must describe and justify the exigency.

If the request is made orally, the NRC should have sufficient information to reach the same conclusions as if it had received a written submittal. The follow-up written request should confirm the information that the staff relied upon in arriving at its conclusion to issue the NOED. If an NOED is authorized orally but the licensee subsequently determines that no violation of the license will occur and thus the NOED is not needed, the licensee and staff should still follow up with appropriate documentation. In such cases, the licensee must submit a letter within 24 hours, documenting its oral request, the NRC's oral approval, and the circumstances that led to the determination that the NOED is no longer needed.

D. STAFF EVALUATION AND DOCUMENTATION

Prior to issuance of an NOED, to the extent practicable, the regional Projects Branch Chief and/or the PM should verify the licensee's oral assertions, including root cause and compensatory measures, and that the NOED request is consistent with the staff's policy and guidance. If any of the verifications cannot be made prior to issuance of the NOED, this should be done subsequently, as soon as time permits. The results of the verification activities are to be documented in a subsequent inspection report. When an NOED is granted either by the region or NRR, the responsible resident inspector should open an Unresolved Item (URI), to facilitate prompt tracking, documentation and closure of inspection, verification and resolution activities, including enforcement action determinations, associated with the NOED.

The staff's letter documenting the NOED should be self-standing, address the appropriate items in Section C.4 of this guidance, and demonstrate that issuance of the NOED is consistent with the policy and guidance. The NOED letter should also clearly specify which of the licensee's arguments the staff accepted in reaching its decision and the criterion that is satisfied. The sequence of events in the staff's letter should be clear and include: how and when the licensee first requested the discretion, what the length of the AOT/surveillance interval involved was, when the allowed time would end, when (if applicable) verbal discretion was issued, the date of the licensee's follow-up written request (if the original was made verbally), the specific period of discretion starting at the end of the AOT and, if the NOED was terminated before the staff's letter is issued, the letter should contain the time the NOED was actually terminated. The staff should document in the NOED letter its verification of the consistency between the licensee's verbal and written requests. The letter should also identify by name and title, the key staff who participated in the NOED evaluation and approval and, if applicable, when the licensee's follow-up license amendment request will be or was submitted.

It is not acceptable to permit the licensee not to follow a TS or license condition while the staff considers a request for discretion. If the licensee is unable to provide the staff an adequate basis before the LCO time ends, the licensee must take the required actions to comply with the TS while endeavoring to provide the staff an adequate basis for granting the NOED. It is recognized that in cases involving short LCO times or complex issues, the staff may have to act before all the information is available. In such cases, if the information presented provides a clear basis that public health and safety is assured and that the criteria of the NOED policy are satisfied, then an NOED may be granted. If subsequent information fails to support the initial issuance of the NOED, it should be terminated, as discussed in Section E. In summary, the time it takes for the staff to evaluate the request for an NOED does not relieve the licensee from taking appropriate actions to comply with the TS.

E. ENFORCEMENT

1.0 Early Termination of NOED

If the NRC decides to terminate the NOED for any reason before the time specified in the NOED, the staff should verify that the licensee takes steps to achieve the appropriate plant status and implement the existing TS-required actions upon oral notification of the termination by the appropriate NRR PD or Regional Division Director.

Upon notification of termination of the NOED, the licensee must inform the NRC of the proposed course of action to restore the plant to a condition of compliance with the license. The termination of the NOED by the NRC should be documented in a letter to the licensee and should address the actions taken or planned by the licensee, including the time necessary for the licensee to achieve the required plant conditions in the most prudent manner considering safety. In all these cases, the NRC will not normally take enforcement action for the TS or license condition violations during the period the NOED was in effect, except for the root causes leading to the noncompliance, as discussed below.

2.0 Consideration of Enforcement

The decision to exercise enforcement discretion by issuing an NOED does not change the fact that a violation will occur, nor does it imply that enforcement discretion is being exercised for any violation that may have led to the need for the NOED. In each case where the NRC staff has chosen to exercise enforcement discretion, enforcement action will normally be taken for any violations that contributed to the root causes leading to the noncompliance. Such enforcement action is intended to emphasize that licensees should not rely on the NRC's NOED process as a routine substitute for compliance or for requesting a license amendment.

NRR-issued NOEDs should be closely coordinated with the appropriate region to ensure that the region considers the need for enforcement action for any root cause violations that led to the NOED issued by NRR. The staff should follow the guidance in the NRC Enforcement Manual, NUREG\BR-0195, to determine and process the appropriate enforcement action. OE approval is required for not issuing an enforcement action if a violation is involved. The enforcement action should reference the NOED number. All staff determinations regarding enforcement action associated with the issuance of an NOED should be documented by the region in the next appropriate inspection report under the URI established to track that NOED, regardless of whether or not the determination is to take enforcement action. If the root cause underlying an NOED request results in an escalated action, the time during which the NOED is effective will not be counted in considering the impact of the violation.

F. DISTRIBUTION

Copies of the letter to the licensee shall be distributed according to established regional and NRR procedures and shall include the following:

1. Regional Coordinator, OEDO
2. Regional Administrator
3. Associate Director for Project Licensing and Technical Analysis, NRR
4. Division Director, Division of Licensing Project Management (DLPM), NRR

5. Director, Office of Enforcement
6. Public
7. Technical Assistant, DLPM, NRR
8. Electronic copy (WordPerfect file) to E-mail address: NOED
9. Electronic copy (WordPerfect file) to NRC Internet Webmaster, E-mail: NRCWEB
10. Appropriate Branch Chiefs (Region and NRR)
11. Appropriate NRR PD and Section Chief
12. Appropriate NRR PM
13. Appropriate Senior Resident Inspector

Further, the issuing office should ensure that the licensee's request is also placed in the Public Document Room and that electronic copies of NOEDs are prepared in accordance with Attachment C. NRR will post the staff's NOED approval or denial letter on the NRC public web page. The NOED will remain on the bulletin board for 6 months for easy public access. The Technical Assistant (TA), DLPM, RR, will maintain a file of all NOEDs. Also, for NRR-issued NOEDs, the PM should send an electronic copy of the letter issuing the follow-up license amendment to the E-mail address: NOED.

G. TRACKING OF NOTICES OF ENFORCEMENT DISCRETION

The NRR PM should open a Technical Assignment Control (TAC) number under Licensing Action code LD for any NOED action involving NRR resources.

Each NOED will be assigned a number to permit tracking. The issuing office (region or NRR) will assign a number consisting of six digits. The first two digits indicate the year, the third digit indicates the number of the region (or 6 for NRR), and the last three digits are the sequential number of the NOED for the issuing office. For example, NOED 98-3-02 is the 2nd NOED issued by Region III in 1998. This number should be included in parenthesis at the end of the subject line for the NOED, for example: (NOED 98-3-02). The TA, DLPM, RR, will assign numbers for all NRR NOEDs and regional assignments will be made in accordance with regional procedures.

Each office (region or NRR) is responsible for tracking the NOEDs it issues and for entering the required data into its tracking system. Additionally, each region will be responsible for inspection, follow-up, and enforcement for all NOEDs issued, including those issued by NRR, for plants in that region.

On a semi-annual basis, the TA, DLPM ill request the regions to provide updated database information regarding follow-up actions to previously issued NOEDs. This should include reference documents and dates for verification of licensees' oral assertions in the NOED requests, the determination to take or to not take enforcement action for any violations that may have led to the need for the NOED, and any follow-up inspections of licensees' root cause determinations, and corrective actions.

H. NOED CHECKLIST

An NOED checklist is provided in Attachment D as an aid to the staff in assuring adherence to this guidance. It's use is discretionary and it is a companion, not a substitute, for the detailed guidance.

I. REFERENCE

NUREG-1600, "General Statement of Policy and Procedures for NRC Enforcement Actions, Section VII C. 'Exercise of Discretion for an Operating Facility'"

END

Attachment A: SAMPLE LETTER FOR NOED ISSUANCE

Addressee
SUBJECT: NOTICE OF ENFORCEMENT DISCRETION FOR [LICENSEE NAME] REGARDING [PLANT NAME(S)] [TAC NO. XXXXXX (if applicable), NOED NO.XXXX]

By letter dated [date of letter], you requested that the NRC exercise discretion not to enforce compliance with the actions required in [TS or license condition citation]. Your letter documented information previously discussed with the NRC in a telephone conference on [date] at [time]. The principal NRC staff members who participated in that telephone conference included [list name and titles of the principal staff participants]. You stated that on [date and time] the plant(s) would not be in compliance with [TS/license condition] which would require [statement of the requirement including the AOT and the date and time when the action statement was entered]. You requested that a Notice of Enforcement Discretion (NOED) be issued pursuant to the NRC's policy regarding exercise of discretion for an operating facility, set out in Section VII.c, of the "General Statement of Policy and Procedures for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600, and be effective for the period [state licensee's requested period for the NOED]. This letter documents our telephone conversation on [date and time] when we orally issued this NOED. [If appropriate: We understand that the condition causing the need for this NOED was corrected by you causing you to exit from the [TS/license condition] and from this NOED on [date and time].

[Briefly restate the licensee's description of the events leading up to the request for the NOED and a summary of their safety rationale for issuing the NOED. Include any compensatory measures that the licensee has proposed.]

[Summarize the staff's evaluation of the licensee's request and supporting safety rationale including the items in Section C.4 of this guidance, state which of the licensee's justifications the staff accepted to the extent that staff verification of the licensee's oral assertions including root causes and compensatory measures, has been made prior to issuance of this letter, such verification should be documented here], and cite the explicit criterion in Section B of this guidance that the licensee satisfied.]

On the basis of the staff's evaluation of your request, we have concluded that an NOED is warranted because we are clearly satisfied that this action involves minimal or no safety impact, is consistent with the enforcement policy and staff guidance, and has no adverse impact on public health and safety. Therefore, it is our intention to exercise discretion not to enforce compliance with [TS/license condition] for the period from [date and time] until [if region-issued: date and time; if NRR-issued: until issuance of a license amendment, and state when the amendment request was or will be submitted; state if the approved NOED effective duration differs from the requested time and why]. [For NRR-issued NOEDs: The staff plans to complete its review and issue the license amendment within 4 weeks of the date of this

letter.

As stated in the Enforcement Policy, action will be taken, to the extent that violations were involved, for the root cause that led to the noncompliance for which this NOED was necessary.

signature

Project Director, NRR
or
Regional Administrator or designee

Docket No(s).: 50-xxx

Attachment B: SAMPLE MEMORANDUM FOR NOTIFICATION OF NOED FOR SEVERE WEATHER OR OTHER NATURAL EVENT

SAMPLE MEMORANDUM FOR NOTIFICATION OF NOED FOR SEVERE WEATHER OR OTHER NATURAL EVENT(Date)

OFFICE OF NUCLEAR REACTOR REGULATION
NOTIFICATION OF ISSUANCE OF AN NOED
FOR SEVERE WEATHER OR OTHER NATURAL EVENT

Licensee: (Name of Licensee)
Facility:
Docket No:
NOED No.

To: Chairman and Commissioners
SUBJECT: ISSUANCE OF AN NOED FOR [Be specific: SEVERE WEATHER OR OTHER NATURAL EVENT]

This is to inform the Commission that a Notice of Enforcement Discretion (NOED) as a result of [severe weather or other natural events] was issued on [date] to [licensee name and facility].

This action is based on the licensee's request on [date] for an NOED. This is an information memorandum and requires no Commission action.

[Describe in summary form: the name, organization and telephone number of the official that made the emergency assessment, Details of the basis and nature of the emergency; consequences of forced compliance with the license conditions to the plant and to exacerbation of the emergency situation; status, and potential challenges to off-site and on-site power sources, and the impact of the emergency on plant safety; demonstrated actions taken to avert and/or alleviate the emergency situation, including steps taken to avoid being in the noncompliance, as well as efforts to minimize grid instabilities (e.g., coordinating with other utilities and the load dispatcher organization for buying additional power or for cycling load, shedding interruptible industrial or non emergency loads).

Contact: (name), NRR, 415-XXXX

Distribution: Regional Administrators
Director, NRR
Cognizant PM/PD

Attachment C: FILE FORMAT FOR ELECTRONIC COPY (WORDPERFECT FILE) OF NOED APPROVAL/DISAPPROVAL LETTER

FILE FORMAT FOR ELECTRONIC COPY (WORDPERFECT FILE)
OF NOED APPROVAL/DISAPPROVAL LETTER

1. Replace the WordPerfect Letterhead Paper Size with Standard Paper Size and include typed letter heading, and letter issue date, as follows:

UNITED STATES
NUCLEAR REGULATORY COMMISSION
Washington, D.C. 20555-0001
October 5, 1998

or for a Region

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW., Suite 23T85
Atlanta, GA 30303-3415
October 5, 1995

2. Remove the concurrence page and any attached internal distribution list.

3. Include the following above the letter author's name:
/original signed by (identify person who signed letter)/

4. Save the WordPerfect file with the following filename: NEyyrser.wpd
   where the number of the NOED is yy-r-ser, for example, NOED 98-1-001 for the first NOED issued by Region 1 in 1998. (WPD just tells users that it is a WordPerfect 6 document.)

5. E-mail WordPerfect file to NRCWEB and NOED.

Attachment D: NOED CHECKLIST

NOED CHECKLIST

NOTE: This is an aid to the staff in assuring adherence to this guidance. It's use is discretionary and it is a companion, not a substitute, for the detailed guidance.

Oral Request Date:_____ TAC No._____

NOED No. _____ NRC NOED Letter Date _____

I. APPLICABILITY

Item		Check		Guidance
1.	Non-compliance related to non-power or permanently shutdown power reactors	Yes	■	Stop. NOED is not applicable.
2.	Non-compliance with TS or license condition	Yes		
		No	■	Stop. NOED is not applicable.
3.	NOED is for short duration (not exceed 14 days), one-time situations	Yes		Regional responsibility
		No	■	NRR responsibility
4.	Non-compliance related to severe weather or other natural events that require balancing of overall public health and safety.	Yes		NRR responsibility. NOED per Section B3. Review justification per Section C 4, item 11. Inform the Commission of the NOED issuance expeditiously.
		No	■	
5.	NOED request is caused by licensee failing to apply for an amendment in a timely manner, i.e., Poor planning.	Yes		Carefully scrutinize to preclude abuse of NOED process. Evaluate criteria for an exigent amendment per 10 CFR 50.91.
		No		
6.	AOT has expired prior to staff approval of NOED	Yes	■	Stop. Licensee must comply with TS.
		No		
7.	Do any of the following apply:	Yes		NOED approval requires closer scrutiny.
	a. TS has been violated	No	■	
	b. Poor planning			
	c. Repeated NOEDs for same reasons			

II. SAFETY CONSIDERATIONS

Item		Check		Guidance
1.	NOED is for an operating plant	Yes		Item 1a or 1b, must be satisfied.
		No		Proceed to Item 2.
	a) NOED is for avoiding undesirable plant transient, i.e., shutdown.	Yes		
		No	■	

	b)	NOED would eliminate testing, inspection or system realignment that is inappropriate for particular plant conditions.	Yes		Item 1a or 1b, must be satisfied
			No	■	
2.	Is the plant in a shutdown condition?		Yes		Item 2a must be satisfied.
			No		Skip 2a and proceed to Item 3.
	a.	NOED would reduce shutdown risk by avoiding testing, inspection or system realignment that is inappropriate for particular plant conditions?	Yes		
			No	■	NOED is not allowed.
3.	Is the plant in a startup condition?		Yes		Item 3a, 3b or 3c must be satisfied
			No	■	
	a)	the equipment or system does not perform a safety function in the mode in which operation is to occur, or			Item 3a, 3b or 3c must be satisfied
	b)	equipment or system safety function is of only marginal safety benefit, and remaining in the current mode increases the likelihood of an unnecessary plant transient, or			
	c)	test, inspection or system realignment is inappropriate for the particular plant conditions because it does not provide a safety benefit, or may be detrimental to safety			

III. PROCESS

Item		Check	Guidance
1.	Licensee's request		1. May be oral. Arrange licensee-staff telephone discussions thru the recorded line (301) 816-5100. 2. Written request within 24 hours. Address items in Section C.4. 3. Submit follow-up license amendment within 48 hrs.
2.	TAC number assigned		Licensing Action Code: LD.
3.	Verification		Region project's Branch Chief/ NRR PM - Verify licensee's oral assertions, to the extent practical.
4.	Concurrence		Region-issued: Requires NRR (PD) concurrence. NRR-issued: Requires regional Divisional Director of Reactor Projects' and cognizant NRR technical branch chief(s) concurrence.

4.	Issuing authority			Region: Regional Administrator or designee NRR: Project Director
5.	NOED number			NRR: Obtain from TA,. DLPM. Region: Per Region guidance
6.	NOED granting			May be oral, to be followed by NOED letter within 2 working days.
7.	Specify maximum period for which NOED is in effect			Region: Maximum 14 days NRR: Until the issuance of amendment (4 weeks maximum).
8.	NOED letter		1.	Follow sample (See Attachment A).
			2.	If subsequent to oral granting of an NOED, the licensee determines that no violation of the license will occur and thus the NOED is not needed, the licensee and staff should still followup with appropriate documentation.
			3.	Document consistency between the oral and written requests.
			4.	Cite and demonstrate how the specific NOED criteria satisfied.
			5.	Identify by name and title principal staff participants in the NOED approval.
			6.	Evaluate and document applicable items in Section C
			7.	Specify time period for which NOED will be in effect..
9.	Follow-up license amendment (NRR)		1.	Issue exigent amendment within 4 weeks. If not, justify promptly by a memo to. Associate Director for Project Licensing and Technical Analysis, NRR.
			2.	Send a copy of the amendment letter to email:NOED
10.	Root cause violations			Determination made. NRR coordinate with the regions
11.	Inspection Report			Region to document root cause violation determination, NOED approval basis, results of verification activities to close URI.
12.	Enforcement action			Coordinate with OE. For all NOEDs, Region to open an URI and document determinations in the next appropriate inspection report.

13.	Licensee LER		Required even if NOED is issued (if otherwise required).
14.	Distribution		See Part 9900. Note: Electronic copy of Word Perfect file to Email addresses: NOED and NRCWEB

IV. LICENSEE REQUEST FOR ENFORCEMENT DISCRETION

Item			Chk	Remarks
1.	The TS or other license conditions that will be violated.			
2.	The circumstances surrounding the situation, including root causes, the need for prompt action and identification of any relevant historical events.			
3.	The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action.			
4.	The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public health and safety and that a significant hazard consideration is involved.			
5..	The basis for the licensee's conclusion that the noncompliance will not involve adverse consequences to the environment			
6.	Any proposed compensatory measure(s).			
7.	The justification for the duration of the noncompliance.			
8.	A statement that the request has been approved by the facility organization that normally reviews safety issues (Plant Onsite Review Committee, or its equivalent).			
9.	The request must specifically address which of the criteria specified in Section B is satisfied and how.			
10.	If a follow-up license amendment is required, the request must include marked-up TS pages showing the proposed TS changes. and a commitment to submit the actual license amendment request within 48 hours.			
11.	For NOEDs involving severe weather or other natural events, the licensee must provide:			
	a.	details of the basis and nature of the emergency; potential consequences of forced compliance with the license conditions to the plant and to exacerbation of the emergency situation. The licensee must provide the name, organization and telephone number of the official that made the emergency assessment		
	b.	status, and potential challenges to offsite and onsite power sources, and the impact of the emergency on plant safety.		
	c.	demonstrated actions taken to avert and/or alleviate the emergency situation, including steps taken to avoid being in the noncompliance, as well as efforts to minimize grid instabilities (e.g., coordinating with other utilities and the load dispatcher organization for buying additional power or for cycling load, shedding interruptible industrial or non-emergency loads).		

1. For purposes of this guidance, "startup" is defined as any condition with the reactor being in other than "operation" in Mode 1 or cold shutdown.

§50.54 Conditions of licenses.

Whether stated therein or not, the following shall be deemed conditions in every license issued:

(a)(1) Each nuclear power plant or fuel reprocessing plant licensee subject to the quality assurance criteria in appendix B of this part shall implement, pursuant to §50.34(b)(6)(ii) of this part, the quality assurance program described or referenced in the Safety Analysis Report, including changes to that report.

(2) Each licensee described in paragraph (a)(1) of this section shall, by June 10, 1983, submit to the appropriate NRC Regional Office shown in appendix D of part 20 of this chapter the current description of the quality assurance program it is implementing for inclusion in the Safety Analysis Report, unless there are no changes to the description previously accepted by NRC. This submittal must identify changes made to the quality assurance program description since the description was submitted to NRC. (Should a licensee need additional time beyond June 10, 1983 to submit its current quality assurance program description to NRC, it shall notify the appropriate NRC Regional Office in writing, explain why additional time is needed, and provide a schedule for NRC approval showing when its current quality assurance program description will be submitted.)

(3) Each licensee described in paragraph (a)(1) of this section may make a change to a previously accepted quality assurance program description included or referenced in the Safety Analysis Report without prior NRC approval, provided the change does not reduce the commitments in the program description as accepted by the NRC. Changes to the quality assurance program description that do not reduce the commitments must be submitted to the NRC in accordance with the requirements of Sec. 50.71(e). In addition to quality assurance program changes involving administrative improvements and clarifications, spelling corrections, punctuation, or editorial items, the following changes are not considered to be reductions in commitment:

(i) The use of a QA standard approved by the NRC which is more recent than the QA standard in the licensee's current QA program at the time of the change;

(ii) The use of a quality assurance alternative or exception approved by an NRC safety evaluation, provided that the bases of the NRC approval are applicable to the licensee's facility;

(iii) The use of generic organizational position titles that clearly denote the position function, supplemented as necessary by descriptive text, rather than specific titles;

(iv) The use of generic organizational charts to indicate functional relationships, authorities, and responsibilities, or, alternately, the use of descriptive text;

(v) The elimination of quality assurance program information that duplicates language in quality assurance regulatory guides and quality assurance standards to which the licensee is committed; and

(vi) Organizational revisions that ensure that persons and organizations performing quality assurance functions continue to have the requisite authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations.

(4) Changes to the quality assurance program description that do reduce the commitments must be submitted to the NRC and receive NRC approval prior to implementation, as follows:

(i) Changes made to the quality assurance program description as presented in the Safety Analysis Report or in a topical report must be submitted as specified in Sec. 50.4.

(ii) The submittal of a change to the Safety Analysis Report quality assurance program description must include all pages affected by that change and must be accompanied by a forwarding letter identifying the change, the reason for the change, and the basis for concluding that the revised program incorporating the change continues to satisfy the criteria of appendix B of this part and the Safety Analysis Report quality assurance program description commitments previously accepted by the NRC (the letter need not provide the basis for changes that correct spelling, punctuation, or editorial items).

(iii) A copy of the forwarding letter identifying the change must be maintained as a facility record for three years.

(iv) Changes to the quality assurance program description included or referenced in the Safety Analysis Report shall be regarded as accepted by the Commission upon receipt of a letter to this effect from the appropriate reviewing office of the Commission or 60 days after submittal to the Commission, whichever occurs first.

(b) No right to the special nuclear material shall be conferred by the license except as may be defined by the license.

(c) Neither the license, nor any right thereunder, nor any right to utilize or produce special nuclear material shall be transferred, assigned, or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, unless the Commission shall, after securing full information, find that the transfer is in accordance with the provisions of the act and give its consent in writing.

(d) The license shall be subject to suspension and to the rights of recapture of the material or control of the facility reserved to the Commission under section 108 of the act in a state of war or national emergency declared by Congress.

(e) The license shall be subject to revocation, suspension, modification, or amendment for cause as provided in the act and regulations, in accordance with the procedures provided by the act and regulations.

(f) The licensee shall at any time before expiration of the license, upon request of the Commission, submit, as specified in §50.4, written statements, signed under oath or affirmation, to enable the Commission to determine whether or not the license should be modified, suspended, or revoked. Except for information sought to verify licensee compliance with the current licensing basis for that facility, the NRC must prepare the reason or reasons for each information request prior to issuance to ensure that the burden to be imposed on respondents is justified in view of the potential safety significance of the issue to be addressed in the requested information. Each such justification provided for an evaluation performed by the NRC staff must be approved by the Executive Director for Operations or his or her designee prior to issuance of the request.

(g) The issuance or existence of the license shall not be deemed to waive, or relieve the licensee from compliance with, the antitrust laws, as specified in subsection 105a of the Act. In the event that the licensee should be found by a court of competent jurisdiction to have violated any provision of such antitrust laws in the conduct of the licensed activity, the Commission may suspend or revoke the license

or take such other action with respect to it as shall be deemed necessary.

(h) The license shall be subject to the provisions of the Act now or hereafter in effect and to all rules, regulations, and orders of the Commission. The terms and conditions of the license shall be subject to amendment, revision, or modification, by reason of amendments of the Act or by reason of rules, regulations, and orders issued in accordance with the terms of the act.

(i) Except as provided in §55.13 of this chapter, the licensee may not permit the manipulation of the controls of any facility by anyone who is not a licensed operator or senior operator as provided in part 55 of this chapter.

(i - 1) Within three months after issuance of an operating license, the licensee shall have in effect an operator requalification program which must as a minimum, meet the requirements of §55.59(c) of this chapter. Notwithstanding the provisions of §50.59, the licensee may not, except as specifically authorized by the Commission decrease the scope of an approved operator requalification program.

(j) Apparatus and mechanisms other than controls, the operation of which may affect the reactivity or power level of a reactor shall be manipulated only with the knowledge and consent of an operator or senior operator licensed pursuant to part 55 of this chapter present at the controls.

(k) An operator or senior operator licensed pursuant to part 55 of this chapter shall be present at the controls at all times during the operation of the facility.

(l) The licensee shall designate individuals to be responsible for directing the licensed activities of licensed operators. These individuals shall be licensed as senior operators pursuant to part 55 of this chapter.

(m)(1) A senior operator licensed pursuant to part 55 of this chapter shall be present at the facility or readily available on call at all times during its operation, and shall be present at the facility during initial start-up and approach to power, recovery from an unplanned or unscheduled shut-down or significant reduction in power, and refueling, or as otherwise prescribed in the facility license.

(2) Notwithstanding any other provisions of this section, by January 1, 1984, licensees of nuclear power units shall meet the following requirements:

(i) Each licensee shall meet the minimum licensed operator staffing requirements in the following table:

Minimum Requirements[1] Per Shift for On-Site Staffing of Nuclear Power Units by Operators and Senior Operators Licensed Under 10 CFR Part 55

		One Unit	Two units		Three units	
Number of nuclear power units operating[2]	**Position**	**One control room**	**One control room**	**Two control rooms**	**Two control rooms**	**Three control rooms**
None	Senior Operator	1	1	1	1	1
	Operator	1	2	2	3	3
One	Senior Operator	2	2	2	2	2
	Operator	2	3	3	4	4
Two	Senior Operator		2	3	[3]3	3
	Operator		3	4	[3]5	5

Three	Senior Operator	3	4
	Operator	5	6

[1]Temporary deviations from the numbers required by this table shall be in accordance with criteria established in the unit's technical specifications.

[2]For the purpose of this table, a nuclear power unit is considered to be operating when it is in a mode other than cold shutdown or refueling as defined by the unit's technical specifications.

[3]The number of required licensed personnel when the operating nuclear power units are controlled from a common control room are two senior operators and four operators.

(ii) Each licensee shall have at its site a person holding a senior operator license for all fueled units at the site who is assigned responsibility for overall plant operation at all times there is fuel in any unit. If a single senior operator does not hold a senior operator license on all fueled units at the site, then the licensee must have at the site two or more senior operators, who in combination are licensed as senior operators on all fueled units.

(iii) When a nuclear power unit is in an operational mode other than cold shutdown or refueling, as defined by the unit's technical specifications, each licensee shall have a person holding a senior operator license for the nuclear power unit in the control room at all times. In addition to this senior operator, for each fueled nuclear power unit, a licensed operator or senior operator shall be present at the controls at all times.

(iv) Each licensee shall have present, during alteration of the core of a nuclear power unit (including fuel loading or transfer), a person holding a senior operator license or a senior operator license limited to fuel handling to directly supervise the activity and, during this time, the licensee shall not assign other duties to this person.

(3) Licensees who cannot meet the January 1, 1984 deadline must submit by October 1, 1983 a request for an extension to the Director of the Office of Nuclear Regulation and demonstrate good cause for the request.

(n) The licensee shall not, except as authorized pursuant to a construction permit, make any alteration in the facility constituting a change from the technical specifications previously incorporated in a license or construction permit pursuant to §50.36 of this part.

(o) Primary reactor containments for water cooled power reactors, other than facilities for which the certifications required under §50.82(a)(1) have been submitted, shall be subject to the requirements set forth in appendix J to this part.

(p)(1) The licensee shall prepare and maintain safeguards contingency plan procedures in accordance with appendix C of part 73 of this chapter for effecting the actions and decisions contained in the Responsibility Matrix of the safeguards contingency plan. The licensee may make no change which would decrease the effectiveness of a security plan, or guard training and qualification plan, prepared pursuant to §50.34(c) or part 73 of this chapter, or of the first four categories of information (Background, Generic Planning Base, Licensee Planning Base, Responsibility Matrix) contained in a licensee safeguards contingency plan prepared pursuant to §50.34(d) or part 73 of this chapter, as applicable, without prior approval of the Commission. A licensee desiring to make such a change shall

submit an application for an amendment to the licensee's license pursuant to §50.90.

(2) The licensee may make changes to the plans referenced in paragraph (p)(1) of this section, without prior Commission approval if the changes do not decrease the safeguards effectiveness of the plan. The licensee shall maintain records of changes to the plans made without prior Commission approval for a period of three years from the date of the change, and shall submit, as specified in §50.4, a report containing a description of each change within two months after the change is made. Prior to the safeguards contingency plan being put into effect, the licensee shall have:

(i) All safeguards capabilities specified in the safeguards contingency plan available and functional,

(ii) Detailed procedures developed according to appendix C to part 73 available at the licensee's site, and

(iii) All appropriate personnel trained to respond to safeguards incidents as outlined in the plan and specified in the detailed procedures.

(3) The licensee shall provide for the development, revision, implementation, and maintenance of its safeguards contingency plan. The licensee shall ensure that all program elements are reviewed by individuals independent of both security program management and personnel who have direct responsibility for implementation of the security program either:

(i) At intervals not to exceed 12 months, or

(ii) As necessary, based on an assessment by the licensee against performance indicators, and as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that potentially could adversely affect security, but no longer than 12 months after the change. In any case, all elements of the safeguards contingency plan must be reviewed at least once every 24 months.

(4) The review must include a review and audit of safeguards contingency procedures and practices, an audit of the security system testing and maintenance program, and a test of the safeguards systems along with commitments established for response by local law enforcement authorities. The results of the review and audit, along with recommendations for improvements, must be documented, reported to the licensee's corporate and plant management, and kept available at the plant for inspection for a period of 3 years.

(q) A licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in §50.47(b) and the requirements in appendix E of this part. A licensee authorized to possess and/or operate a research reactor or a fuel facility shall follow and maintain in effect emergency plans which meet the requirements in appendix E to this part. The licensee shall retain the emergency plan and each change that decreases the effectiveness of the plan as a record until the Commission terminates the license for the nuclear power reactor. The nuclear power reactor licensee may make changes to these plans without Commission approval only if the changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the standards of §50.47(b) and the requirements of appendix E to this part. The research reactor and/or the fuel facility licensee may make changes to these plans without Commission approval only if these changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the requirements of appendix E to this part. This nuclear power reactor, research reactor, or fuel facility licensee shall retain a record of each change to the emergency plan made without prior Commission approval for a period of three years from the date of the change. Proposed changes that decrease the effectiveness of the approved

emergency plans may not be implemented without application to and approval by the Commission. The licensee shall submit, as specified in §50.4, a report of each proposed change for approval. If a change is made without approval, the licensee shall submit, as specified in §50.4, a report of each change within 30 days after the change is made.

(r) Each licensee who is authorized to possess and/or operate a research or test reactor facility with an authorized power level greater than or equal to 2 MW thermal, under a licensee of the type specified in §50.21(c), shall submit emergency plans complying with 10 CFR part 50, appendix E, to the Director of the Office of Nuclear Reactor Regulation for approval by September 7, 1982. Each licensee who is authorized to possess and/or operate a research or test reactor facility with an authorized power level less than 2 MW thermal, under a license of the type specified in §50.21(c), shall submit emergency plans complying with 10 CFR part 50, appendix E, to the Director of the Office of Nuclear Reactor Regulation for approval by November 3, 1982.

(s)(1) Each licensee who is authorized to possess and/or operate a nuclear power reactor shall submit to NRC within 60 days of the effective date of this amendment the radiological emergency response plans of State and local governmental entities in the United States that are wholly or partially within a plume exposure pathway EPZ, as well as the plans of State governments wholly or partially within an ingestion pathway EPZ.[(1),(2)] Ten (10) copies of the above plans shall be forwarded to the Director of Nuclear Reactor Regulation with 3 copies to the Administrator of the appropriate NRC regional office. Generally, the plume exposure pathway EPZ for nuclear power reactors shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs for a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway EPZ shall focus on such actions as are appropriate to protect the food ingestion pathway.

(2)(i) For operating power reactors, the licensee, State, and local emergency response plans shall be implemented by April 1, 1981, except as provided in section IV.D.3 of appendix E to this part.

(ii) If after April 1, 1981, the NRC finds that the state of emergency preparedness does not provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency (*including findings based on requirements of appendix E, section IV.D.3*) and if the deficiencies (*including deficiencies based on requirements of appendix E, section IV.D.3*) are not corrected within four months of that finding, the Commission will determine whether the reactor shall be shut down until such deficiencies are remedied or whether other enforcement action is appropriate. In determining whether a shutdown or other enforcement action is appropriate, the Commission shall take into account, among other factors, whether the licensee can demonstrate to the Commission's satisfaction that the deficiencies in the plan are not significant for the plant in question, or that adequate interim compensating actions have been or will be taken promptly, or that that there are other compelling reasons for continued operation.

(3) The NRC will base its finding on a review of the FEMA findings and determinations as to whether State and local emergency plans are adequate and capable of being implemented, and on the NRC assessment as to whether the licensee's emergency plans are adequate and capable of being implemented.

Nothing in this paragraph shall be construed as limiting the authority of the Commission to take action under any other regulation or authority of the Commission or at any time other than that specified in this paragraph.

(t)(1) The licensee shall provide for the development, revision, implementation, and maintenance of its emergency preparedness program. The licensee shall ensure that all program elements are reviewed by persons who have no direct responsibility for the implementation of the emergency preparedness program either:

(i) At intervals not to exceed 12 months or,

(ii) As necessary, based on an assessment by the licensee against performance indicators, and as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness, but no longer than 12 months after the change. In any case, all elements of the emergency preparedness program must be reviewed at least once every 24 months.

(2) The review must include an evaluation for adequacy of interfaces with State and local governments and of licensee drills, exercises, capabilities, and procedures. The results of the review, along with recommendations for improvements, must be documented, reported to the licensee's corporate and plant management, and retained for a period of 5 years. The part of the review involving the evaluation for adequacy of interface with State and local governments must be available to the appropriate State and local governments.

(u) Within 60 days after the effective date of this amendment, each nuclear power reactor licensee shall submit to the NRC plans for coping with emergencies that meet standards in §50.47(b) and the requirements of appendix E to this part.

(v) Each licensee subject to the requirements of part 73 of this chapter shall ensure that physical security, safeguards contingency and guard qualification and training plans and other related Safeguards Information are protected against unauthorized disclosure in accordance with the requirements of §73.21 of this chapter, as appropriate.

(w) Each power reactor licensee under this part for a production or utilization facility of the type described in §§50.21(b) or 50.22 shall take reasonable steps to obtain insurance available at reasonable costs and on reasonable terms from private sources or to demonstrate to the satisfaction of the NRC that it possesses an equivalent amount of protection covering the licensee's obligation, in the event of an accident at the licensee's reactor, to stabilize and decontaminate the reactor and the reactor station site at which the reactor experiencing the accident is located, provided that:

(1) The insurance required by paragraph (w) of this section must have a minimum coverage limit for each reactor station site of either $1.06 billion or whatever amount of insurance is generally available from private sources, whichever is less. The required insurance must clearly state that, as and to the extent provided in paragraph (w)(4) of this section, any proceeds must be payable first for stabilization of the reactor and next for decontamination of the reactor and the reactor station site. If a licensee's coverage falls below the required minimum, the licensee shall within 60 days take all reasonable steps to restore its coverage to the required minimum. The required insurance may, at the option of the licensee, be included within policies that also provide coverage for other risks, including, but not limited to, the risk of direct physical damage.

(2)(i) With respect to policies issued or annually renewed on or after April 2, 1991, the proceeds of such required insurance must be dedicated, as and to the extent provided in this paragraph, to reimbursement or payment on behalf of the insured of reasonable expenses incurred or estimated to be incurred by the licensee in taking action to fulfill the licensee's obligation, in the event of an accident at the licensee's reactor, to ensure that the reactor is in, or is returned to, and maintained in, a safe and stable condition and that radioactive contamination is removed or controlled such that personnel exposures are consistent with the occupational exposure limits in 10 CFR part 20. These actions must be consistent with any other obligation the licensee may have under this chapter and must be subject to paragraph (w)(4) of this section. As used in this section, an "accident" means an event that involves the release of radioactive material from its intended place of confinement within the reactor or on the reactor station site such that there is a present danger of release off site in amounts that would pose a threat to the public health and safety.

(ii) The stabilization and decontamination requirements set forth in paragraph (w)(4) of this section must apply uniformly to all insurance policies required under paragraph (w) of this section.

(3) The licensee shall report to the NRC on April 1 of each year the current levels of this insurance or financial security it maintains and the sources of this insurance or financial security.

(4)(i) In the event of an accident at the licensee's reactor, whenever the estimated costs of stabilizing the licensed reactor and of decontaminating the reactor and the reactor station site exceed $100 million, the proceeds of the insurance required by paragraph (w) of this section must be dedicated to and used, first, to ensure that the licensed reactor is in, or is returned to, and can be maintained in, a safe and stable condition so as to prevent any significant risk to the public health and safety and, second, to decontaminate the reactor and the reactor station site in accordance with the licensee's cleanup plan as approved by order of the Director of the Office of Nuclear Reactor Regulation. This priority on insurance proceeds must remain in effect for 60 days or, upon order of the Director, for such longer periods, in increments not to exceed 60 days except as provided for activities under the cleanup plan required in paragraphs (w)(4)(iii) and (w)(4)(iv) of this section, as the Director may find necessary to protect the public health and safety. Actions needed to bring the reactor to and maintain the reactor in a safe and stable condition may include one or more of the following, as appropriate: (A) Shutdown of the reactor; (B) Establishment and maintenance of long-term cooling with stable decay heat removal; (C) Maintenance of sub-criticality; (D) Control of radioactive releases; and (E) Securing of structures, systems, or components to minimize radiation exposure to onsite personnel or to the offsite public or to facilitate later decontamination or both.

(ii) The licensee shall inform the Director of the Office of Nuclear Reactor Regulation in writing when the reactor is and can be maintained in a safe and stable condition so as to prevent any significant risk to the public health and safety. Within 30 days after the licensee informs the Director that the reactor is in this condition, or at such earlier time as the licensee may elect or the Director may for good cause direct, the licensee shall prepare and submit a cleanup plan for the Director's approval. The cleanup plan must identify and contain an estimate of the cost of each cleanup operation that will be required to decontaminate the reactor sufficiently to permit the licensee either to resume operation of the reactor or to apply to the Commission under §50.82 for authority to decommission the reactor and to surrender the license voluntarily. Cleanup operations may include one or more of the following, as appropriate: (A) Processing any contaminated water generated by the accident and by decontamination operations to remove radioactive materials; (B) Decontamination of surfaces inside the auxiliary and fuel-handling

buildings and the reactor building to levels consistent with the Commission's occupational exposure limits in 10 CFR part 20, and decontamination or disposal of equipment; (C) Decontamination or removal and disposal of internal parts and damaged fuel from the reactor vessel; and (D) Cleanup of the reactor coolant system.

(iii) Following review of the licensee's cleanup plan, the Director will order the licensee to complete all operations that the Director finds are necessary to decontaminate the reactor sufficiently to permit the licensee either to resume operation of the reactor or to apply to the Commission under §50.82 for authority to decommission the reactor and to surrender the license voluntarily. The Director shall approve or disapprove, in whole or in part for stated reasons, the licensee's estimate of cleanup costs for such operations. Such order may not be effective for more than 1 year, at which time it may be renewed. Each subsequent renewal order, if imposed, may be effective for not more than 6 months.

(iv) Of the balance of the proceeds of the required insurance not already expended to place the reactor in a safe and stable condition pursuant to paragraph (w)(2)(i) of this section, an amount sufficient to cover the expenses of completion of those decontamination operations that are the subject of the Director's order shall be dedicated to such use, provided that, upon certification to the Director of the amounts expended previously and from time to time for stabilization and decontamination and upon further certification to the Director as to the sufficiency of the dedicated amount remaining, policies of insurance may provide for payment to the licensee or other loss payees of amounts not so dedicated, and the licensee may proceed to use in parallel (and not in preference thereto) any insurance proceeds not so dedicated for other purposes.

(x) A licensee may take reasonable action that departs from a license condition or a technical specification (contained in a license issued under this part) in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical specifications that can provide adequate or equivalent protection is immediately apparent.

(y) Licensee action permitted by paragraph (x) of this section shall be approved, as a minimum, by a licensed senior operator, or, at a nuclear power reactor facility for which the certifications required under §50.82(a)(1) have been submitted, by either a licensed senior operator or a certified fuel handler, prior to taking the action.

(z) Each licensee with a utilization facility licensed pursuant to sections 103 or 104b. of the Act shall immediately notify the NRC Operations Center of the occurrence of any event specified in §50.72 of this part.

(aa) The license shall be subject to all conditions deemed imposed as a matter of law by sections 401(a)(2) and 401(d) of the Federal Water Pollution Control Act, as amended (33 U.S.C.A. 1341(a)(2) and (d).)

(bb) For nuclear power reactors licensed by the NRC, the licensee shall, within 2 years following permanent cessation of operation of the reactor or 5 years before expiration of the reactor operating license, whichever occurs first, submit written notification to the Commission for its review and preliminary approval of the program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor following permanent cessation of operation of the reactor until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its

ultimate disposal in a repository. Licensees of nuclear power reactors that have permanently ceased operation by April 4, 1994 are required to submit such written notification by April 4, 1996. Final Commission review will be undertaken as part of any proceeding for continued licensing under part 50 or part 72 of this chapter. The licensee must demonstrate to NRC that the elected actions will be consistent with NRC requirements for licensed possession of irradiated nuclear fuel and that the actions will be implemented on a timely basis. Where implementation of such actions requires NRC authorizations, the licensee shall verify in the notification that submittals for such actions have been or will be made to NRC and shall identify them. A copy of the notification shall be retained by the licensee as a record until expiration of the reactor operating license. The licensee shall notify the NRC of any significant changes in the proposed waste management program as described in the initial notification.

(cc)(1) Each licensee shall notify the appropriate NRC Regional Administrator, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11 (Bankruptcy) of the United States Code by or against:

(i) The licensee;

(ii) An entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or

(iii) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.

(2) This notification must indicate:

(i) The bankruptcy court in which the petition for bankruptcy was filed; and

(ii) The date of the filing of the petition.

(dd) A licensee may take reasonable action that departs from a license condition or a technical specification (contained in a license issued under this part) in a national security emergency:

(1) When this action is immediately needed to implement national security objectives as designated by the national command authority through the Commission, and

(2) No action consistent with license conditions and technical specifications that can meet national security objectives is immediately apparent.

A national security emergency is established by a law enacted by the Congress or by an order or directive issued by the President pursuant to statutes or the Constitution of the United States. The authority under this paragraph must be exercised in accordance with law, including section 57e of the Act, and is in addition to the authority granted under paragraph (x) of this section, which remains in effect unless otherwise directed by the Commission during a national security emergency.

(ee)(1) Each license issued under this part authorizing the possession of byproduct and special nuclear material produced in the operation of the licensed reactor includes, whether stated in the license or not, the authorization to receive back that same material, in the same or altered form or combined with byproduct or special nuclear material produced in the operation of another reactor of the same licensee located at that site, from a licensee of the Commission or an Agreement State, or from a non-licensed entity authorized to possess the material.

(2) The authorizations in this subsection are subject to the same limitations and requirements applicable to the original possession of the material.

(3) This paragraph does not authorize the receipt of any material recovered from the reprocessing of irradiated fuel.

(ff) For licensees of nuclear power plants that have implemented the earthquake engineering criteria in Appendix S to this part, plant shutdown is required as provided in Paragraph IV(a)(3) of Appendix S to this part. Prior to resuming operations, the licensee shall demonstrate to the Commission that no functional damage has occurred to those features necessary for continued operation without undue risk to the health and safety of the public and the licensing basis is maintained.

[21 FR 355, Jan. 19, 1956]

EDITORIAL NOTE: For additional FEDERAL REGISTER citations affecting §50.54, see the List of CFR Sections Affected in the Finding Aids section of this volume.

[**CFR Index** | **Part 50 Index** | **NRC Home Page**]

[1] Emergency Planning Zones (EPZs) are discussed in NUREG - 0396; EPA 520/1 - 78 - 016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978.

[2] If the State and local emergency response plans have been previously provided to the NRC for inclusion in the facility docket, the applicant need only provide the appropriate reference to meet this requirement.

November 24, 1999

MEMORANDUM TO: Frank J. Congel, Director
Incident Response Operations

FROM: Original signed by Brian W. Sheron FOR
Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

SUBJECT: IMPLEMENTING PROCEDURE FOR POWER REACTOR NOEDs PROCESSED DURING THE Y2K TRANSITION

The staff has prepared the attached implementing procedure (Attachment 1) for power reactor Year 2000 (Y2K)-related Notices of Enforcement Discretion (NOEDs) for inclusion in the agency Y2K contingency plan. This procedure was prepared in accordance with SECY-99-134, “Agency Contingency Plans for the Year 2000 [Y2K] Computer Problem in the Nuclear Industry,” and consistent with SECY-99-135, "Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition." The interim enforcement policy was published in the *Federal Register* on July 30, 1999, and in the NRC Enforcement Policy on November 9, 1999.

NRR staff consulted with members of the Incident Response Operations (IRO) and regional staffs in developing this procedure. This memorandum confirms the procedure that NRR and IRO staff have jointly developed for use by the Y2K Response Team and reflects extensive interaction with the regional staffs and lessons learned from the October 15, 1999, Y2K exercise. A copy of the procedure will be provided to licensees via a regulatory issue summary.

This procedure contains the process for granting or denying NOEDs during the Y2K transition, a copy of the signed delegation of authority memorandum from the Director of NRR, the proposed staffing plan, a sample NOED processing worksheet, and examples of possible NOED scenarios.

Attachment: Implementing Procedure for Power Reactor NOEDs Processed During the Y2K Transition

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IMPLEMENTING PROCEDURE FOR POWER REACTOR
NOEDs PROCESSED DURING THE Y2K TRANSITION

1 PURPOSE/DESCRIPTION

The NRC's Enforcement Policy, Appendix E (included in the *Federal Register* notice provided in Attachment 1A), describes NRC's Interim Policy for Exercising Notices of Enforcement Discretion (NOEDs) for Nuclear Power Plants During the Year 2000 Transition[1]. All licensees have been declared Y2K-ready and the need for enforcement discretion is considered unlikely.

The NRC recognizes that, despite licensees' efforts, power reactors may be susceptible to events during the Y2K transition resulting in potential noncompliance with the license and requiring shutdown. Such shutdowns could exacerbate localized or widespread power outages. Accordingly, continued safe operation of nuclear power plants during critical Y2K periods may be necessary to help in maintaining stable and reliable electrical power. NRC enforcement discretion may be requested by power reactor licensees to deal with noncompliance situations.

The decision to exercise enforcement discretion does not change the fact that the licensee will be in noncompliance nor does it imply that enforcement discretion is being exercised for any noncompliance that may have led to the noncompliance at issue. To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was granted. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision. Consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include assessment of civil penalties and the issuance of orders.

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[1]On November 9, 1999, the revised NRC Enforcement Policy was published. This revision includes the interim Y2K policy, though the "Appendix E" designation has been eliminated.

2 CRITERIA

2.1 NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion

Criteria for granting or denying a regular or weather-related NOED are contained in Inspection Manual Part 9900. For a Y2K-related situation,[2] licensee NOED requests should address all of these criteria to the extent practicable except as provided in the Y2K interim NOED policy.

2.2 Criteria Unique to Y2K

Criteria unique to Y2K are prescribed in the NRC Enforcement Policy with additional background material provided in the *Federal Register* notice (Attachment 1A). In Y2K-related situations in which forced compliance with license conditions (including technical specifications (TSs)) would require a plant shutdown, and continued plant operation is needed to help maintain a reliable and stable grid, licensees may request a NOED. The staff will consider such a request when the licensee has determined that:

(a) Complying with the license conditions, including TSs, in a Y2K-related situation would require a plant shutdown;

(b) Continued plant operation is needed to help maintain a reliable and stable grid; and

(c) Any decrease in safety as a result of continued plant operation is small (considering both risk and deterministic aspects), and reasonable assurance of public health and safety, the environment, and security is maintained with the enforcement discretion.

3 PROCESS

The guidance in NRC Inspection Manual Part 9900 should be followed to the extent possible. In recognition of potential communication challenges during the Y2K transition, staff communications and NOED processing should follow this implementing procedure. Attachment 1B provides a list of sequential steps for the NRC to follow to gather sufficient information to support a decision on each NOED request.

During the Y2K transition period, if a situation arises that generates a need for a regular or severe weather NOED request, the normal NOED guidance in NRC Inspection Manual Part 9900 should be followed.

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[2] A Y2K-related situation is any situation occurring during the Y2K transition involving potential grid problems, whether or not the situation or the grid issue is caused by a Y2K deficiency.

3.1 Licensee Responsibilities

In seeking NOEDs, power reactor licensees should:

(a) Follow the existing guidance in the NRC Inspection Manual Part 9900 to the extent possible, and provide as much information as possible to enable the NRC staff to make a determination for exercising enforcement discretion. (See Section C.4.0, Part 9900, NOED guidance). Specifically, licensees should provide details of the status of the plant; basis and nature of the issue; potential challenges to offsite and onsite power sources; and consequences of forced compliance with license conditions to the plant and to exacerbation of the situation.

(b) Address criteria in Section 2 above.

(c) Contact the NRC early in the evaluation process, particularly in time-critical situations, even though complete information, as specified in NRC Inspection Manual Part 9900, may not be available.

(d) Contact, in the following order, the NRC Headquarters Operations Center, the Region IV Incident Response Center (IRC), or any other available regional IRC.

(e) Provide a written justification or, in hardship circumstances, justification by telephone followed within 24 hours, or as soon as possible, by written justification. Hardship circumstances may include time limitations or inability to provide written material due to communications difficulties.

(f) Provide a facsimile of the applicable TS pages, if necessary.

3.2 Communications

Communication protocol will be ensured through NOED team training and following the sequential process outlined in Attachment 1B. Communication with NRC and NRC staff approval are required for continued plant operation. Without NRC approval, licensees should take actions in conformance with their license conditions and applicable regulations (for example, 10 CFR 50.54(x), if appropriate). If communications are established but the volume of requests is such that the NRC staff cannot review and approve or deny them in a timely fashion, then the staff will obtain sufficient safety-significant information from the licensee to make a prompt initial assessment. Unless the assessment is unfavorable, the licensee will be permitted to proceed with its planned course of action. A more detailed assessment will be made as soon as possible.

3.3 Headquarters and Regional NOED Team Responsibilities

The Interim Policy, as published in the *Federal Register*, directs power reactor licensees to contact the Headquarters Operations Center if they seek enforcement discretion during the Y2K transition. Contacting Headquarters parallels the approach taken in situations of severe weather, where the NOED action is managed by the Headquarters staff, with the decision authority delegated to the appropriate NRR project director. Typically, the severe weather NOED decision is made by Headquarters with regional concurrence. This approach was also

established for all NOEDs during the Y2K transition in recognition of the high confidence in the communications capabilities of the Headquarters Operations Center and the substantial staff expected to be on duty at the Headquarters Operations Center during the Y2K transition. It is expected, however, that most NOED requests will involve situations in which, under other circumstances, the NOED decision would be made by the region, with Headquarters concurrence, as described in NRC Inspection Manual Part 9900 (that is, these NOEDs will likely not necessitate an exigent TS change.) On the basis of these considerations, the following sections describe the Headquarters and regional responsibilities in dealing with power reactor NOED requests during the Y2K transition.

(a) The reactor safety team director, or his designee, and the regional administrators, or their designees, are delegated the authority from the Director, NRR, to grant or deny NOEDs. (See Attachment 1C for delegation of authority and Attachment 1D for staffing plans.)

(b) The Headquarters Y2K Response Team expects that the Region IV and cognizant regional IRC teams (if other than Region IV) will participate in all telephone discussions with the licensee and all internal staff discussions, to the extent possible. The cognizant regional team should assure participation by the appropriate resident inspector, if possible.

(c) The Headquarters Y2K Response Team will coordinate all NOED requests and activities will be conducted in conjunction with the cognizant regional team. Both teams will jointly evaluate such requests. Following the Part 9900 analogy for severe weather NOEDs, the Headquarters Y2K Response Team will assume lead responsibility for the agency response to all NOED requests. Depending on the nature of the request and the competing activities, the Headquarters team may request a regional team to take the lead for some NOED evaluations.

(d) In the case of a Headquarters communications loss or an event such that the Headquarters Operations Center is no longer functional, the Region IV IRC will assume the coordination role. Region IV will attempt to restore communications between the licensee and the cognizant regional IRC team. In this situation, it is expected that Region IV will transfer the lead for NOED approval or denial to the cognizant regional IRC team on a case-by-case basis.

(e) If situations arise that result in a loss of communications between licensees and Headquarters and Region IV, any region can process and grant or deny NOEDs, consistent with the Y2K delegation of authority (Attachment 1C).

(f) When multiple NOED requests need to be evaluated simultaneously, the Headquarters Y2K Response Team, in coordination with the regional teams, to the extent possible, will prioritize the requests based on:

(i) overall safety significance of the issue
(ii) grid stability and reliability
(iii) duration of the allowed outage time (AOT) and remaining time before AOT expires
(iv) operability of other safety-related systems
(v) compensatory measures in place

(g) The Headquarters Y2K Response Team should prepare a real-time worksheet to document the initial processing of each NOED teleconference and evaluation, as shown in Attachment 1B.

(h) The organization having the lead will grant or deny the NOED by telephone. The necessary followup documentation to the licensee will be prepared by the region or project manager, depending on whether the region or Headquarters had responsibility for the NOED processing.

(i) NOED sequence numbers will be assigned by the approving office. NOED database updates will be completed after the Y2K transition.

4 POSSIBLE SCENARIOS

Possible power reactor NOED scenarios are presented in Attachment 1E.

5 LIST OF ATTACHMENTS

1A Y2K Enforcement Discretion Federal Register Notice Dated July 30, 1999
1B NOED Desktop Worksheet
1C Delegation of Authority for all Power Reactor NOEDs Processed During the Y2K Transition
1D Staffing Plan
1E NOED Scenarios

Y2K Enforcement Discretion Federal Register Notice Dated July 30, 1999
(Volume 64, Number 146)

NUCLEAR REGULATORY COMMISSION
[NUREG-1600, Revision 1]
Policy and Procedure for NRC Enforcement Actions; Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition

AGENCY: Nuclear Regulatory Commission.

ACTION: Policy statement; amendment.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, Revision 1 (Enforcement Policy), by adding Appendix E. This amendment adds an interim enforcement policy that the NRC will follow to exercise enforcement discretion for noncompliance with license conditions, including technical specifications (TSs), because of year 2000 (Y2K) related situations.

DATES: This action is effective August 30, 1999. Comments on this revision should be submitted within 30 days of publication in the Federal Register and will be considered by the NRC prior to the next Enforcement Policy revision.

ADDRESSES: Submit written comments to David L. Meyer, Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mail Stop T-6 D59, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland, between 7:30 a.m. and 4:15 p.m., Federal workdays. Copies of comments received may be examined at the NRC Public Document Room, 2120 L Street, NW, (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Richard Wessman, Deputy Director, Division of Engineering, 301-415-3298, or Allen Hansen, Lead Project Manager, Division of Licensing Project Management, 301-415-1390, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

SUPPLEMENTARY INFORMATION:

Background

Y2K-related events arise from a date-related problem that is experienced by a software system, a software application, or a digital device at a key rollover date when the system, application, or device does not perform its intended function. The key rollover dates are January 1, 2000; February 29, 2000 (an uncommon leap day); and December 31, 2000 (the 366th day of an uncommon leap year). The nuclear utility industry is engaged in Y2K readiness programs at all nuclear power plant facilities to seek out and correct Y2K-related problems that have any potential to adversely affect facility operations.

Y2K concerns result from licensees' reliance upon

(1) Software to schedule maintenance and technical specification surveillances;

(2) Programmable logic controllers and other commercial off-the-shelf software and hardware;

(3) Digital process control systems;

(4) Software to support facility operation;

(5) Digital systems for collection of operating data; and

(6) Digital systems to monitor post-accident plant conditions.

It is recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the problem. Additionally, software, data, and systems external to the facility could adversely affect the facility (for example, interruption of communications or partial loss of offsite power).

The electricity production and delivery systems, as two of the more important elements of the North American economic and social infrastructure, must remain dependable during Y2K transition or rollover periods. Most other critical elements of the infrastructure depend on the availability of an interconnected, stable, and reliable supply of electrical power. There is no doubt that cascading or even localized outages of generators and transmission facilities could have serious short-term and long-term consequences.

Continued safe operation of nuclear power plants during Y2K transition or rollover periods will play a major role in maintaining stable and reliable electrical power supply systems, providing necessary reserve power if there are major losses at other generating facilities. The NRC staff is issuing interim guidance on the process for the NRC to exercise enforcement discretion in certain situations where power reactor licensees encounter Y2K-associated compliance problems in the Y2K transition period (December 31, 1999, through the first few days of 2000) or in other key rollover periods. The exercise of enforcement discretion may support a licensee decision to keep the plant in operation, if the licensee has determined that safety will not be unacceptably affected, in order to help maintain electrical grid stability and reliability. The NRC Headquarters Operations Center and the NRC Region IV Incident Response Center will have staff augmented during the key transition from December 31, 1999, to January 1, 2000, to ensure that appropriate actions can be taken for any regulatory issues that arise.

Scope

This interim enforcement policy provides for the exercise of enforcement discretion to address noncompliance with license conditions, including TSs, because of Y2K transition or rollover issues. The interim enforcement policy applies to situations in which plant operation is needed to help maintain the stability and reliability of the electrical power supply system, even when license conditions, including TSs, would require a plant shutdown. If such situations

occur, licensees are expected to follow the existing guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion <http://www.nrc.gov/NRC/IM/noed.html> to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. Licensees may decide to continue operations upon making a determination that it is safe and prudent to do so to help maintain electrical grid stability and reliability, and when certain criteria are met. This enforcement discretion does not extend to situations in which the licensee may be unable to communicate with the NRC. (The staff assessment of telecommunications capability indicates that a loss of all telecommunications between NRC and licensees is highly unlikely.)

To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was used. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision. Consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include the assessment of civil penalties and the issuance of orders.

Paperwork Reduction Act Statement

This interim policy statement does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval number 3150-0136.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

The NRC is revising the NRC Enforcement Policy by adding Appendix E to read as follows:

GENERAL STATEMENT OF POLICY AND PROCEDURE FOR NRC ENFORCEMENT ACTIONS

* * * * *

Appendix E: Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition

This appendix sets forth the interim enforcement policy that will govern the exercise of enforcement discretion by the NRC staff when licensees of operating nuclear power plants find it necessary to deviate from license conditions, including technical specifications (TSs), in those cases in which year 2000 (Y2K) related complications would otherwise require a plant shutdown

that could adversely affect the stability and reliability of the electrical power grid. This policy does not extend to situations in which a licensee may be unable to communicate with the NRC.

The policy is effective August 30, 1999, and will remain in effect through January 1, 2001. This policy only applies during Y2K transition or rollover periods (December 31, 1999, through January 3, 2000; February 28, 2000, through March 1, 2000; and December 30, 2000, through January 1, 2001). During these periods, a licensee may contact the NRC Headquarters Operations Center and seek NRC enforcement discretion with regard to the potential noncompliance with license conditions, including TSs, if the licensee has determined that:

(a) Complying with license conditions, including TSs, in a Y2K-related situation would require a plant shutdown;

(b) Continued plant operation is needed to help maintain a reliable and stable grid; and

(c) Any decrease in safety as a result of continued plant operation is small (considering both risk and deterministic aspects), and reasonable assurance of public health and safety, the environment, and security is maintained with the enforcement discretion.

Licensees are expected to follow the existing guidance as stated in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion to the maximum extent practicable, particularly regarding a safety determination and notification of NRC. A licensee seeking NRC enforcement discretion must provide a written justification, or in circumstances in which good cause is shown, an oral justification followed as soon as possible by written justification. The justification must document the need and safety basis for the request and provide whatever other information the NRC staff needs to make a decision regarding whether the exercise of discretion is appropriate. The NRC staff may grant enforcement discretion on the basis of balancing the public health and safety or common defense and security of not operating against potential radiological or other hazards associated with continued operation, and a determination that safety will not be unacceptably affected by exercising the discretion. The Director of the Office of Nuclear Reactor Regulation, or designee, will advise the licensee whether the NRC has approved the licensee’s request and, if so, will subsequently confirm the exercise of discretion in writing. Enforcement discretion will only be exercised if the NRC staff is clearly satisfied that the action is consistent with protecting public health and safety and is warranted in the circumstances presented by the licensee.

If the volume of requests to the NRC Headquarters Operations Center is such that the NRC staff cannot review and approve all licensee requests in a timely fashion, the NRC staff will obtain the safety-significant information from the licensee to enable the NRC staff to make a prompt initial assessment. Unless the assessment is unfavorable, the licensee would be permitted to proceed with its planned course of action. The NRC staff will complete these assessments as time permits and the licensee will be advised of the results orally, if possible, and then in writing. If the NRC staff's prompt initial assessment or subsequent assessment determines that a licensee’s actions raise safety concerns, the licensee would be so informed. The licensee would then be required to follow its license conditions, including TSs.

If there are communications difficulties between the licensee and the NRC, the licensee is encouraged to interact with the NRC inspector onsite who will have a dedicated satellite telephone. The inspector should be able to facilitate communication with the NRC

Headquarters Operations Center and/or the NRC Regional Incident Response Centers (IRCs). If communication with the NRC Headquarters Operations Center is not possible, then the licensee should contact the IRC in NRC Region IV to discuss enforcement discretion. Similarly, if the Region IV IRC cannot be reached, then the licensee should attempt to contact the Region I, II and III IRCs. Although it is considered highly unlikely, if communication with NRC is not possible, the licensee should follow the plant license conditions, including technical specifications.

In conducting its assessments, the licensee should follow, to the extent practicable, the guidance in NRC Inspection Manual Part 9900 for Notices of Enforcement Discretion. Contrary to Part 9900 Section B.3 guidance, it is not necessary for an emergency to be declared by a government entity. Licensees are encouraged to contact NRC early in their evaluation process, particularly if time is of the essence, even though complete information as specified in Part 9900 may not be available.

The decision to exercise enforcement discretion does not change the fact that the licensee will be in noncompliance nor does it imply that enforcement discretion is being exercised for any noncompliance that may have led to the noncompliance at issue. To the extent noncompliance was involved, the NRC staff will normally take enforcement action for the root causes that led to the noncompliance for which enforcement discretion was granted. Enforcement action will also be considered in those cases in which incorrect or incomplete information was provided to the NRC staff by a licensee in its justification. The NRC recognizes that a licensee will need to exercise judgement in making a determination under this discretion provision. Consistent with the NRC's position involving 10 CFR 50.54(x), enforcement action for a violation of a license condition, including a TS, will not be taken unless a licensee's action was clearly unreasonable considering all the relevant circumstances. Enforcement action could include assessment of civil penalties and the issuance of orders.

Dated at Rockville, Maryland, this 26th day of July, 1999.

For the Nuclear Regulatory Commission.

/s/

Annette Vietti-Cook,
Secretary of the Commission.

NOED DESKTOP WORKSHEET

Notes	STEP 1: INITIAL CONTACT BETWEEN NRC AND UTILITY
NRC Lead Communicator: PM ___ or _____	Plant_____ Licensee Lead Contact _____ Phone numbers_____ Bridge #_____ NOED Project Manager (PM)_____ **Once information is identified proceed to step 2**

Notes	STEP 2: ESTABLISHMENT OF BASIC COMMUNICATIONS
NRC Lead Communicator: PM ___ or _____	Issue_____ TS #_____ TS Description_____ AOT_____ LCO Expiration Date/Time_____/_____ Eastern Standard Time (EST) Required Principal Personnel on Bridge? Licensee - name_____ HQ - name_____ RG IV - name_____ Region ___ - name_____ Resident Inspectors_____ **Once reasonable efforts have been made to establish NRR and regional participation proceed to step 3**

Notes	STEP 3: PLANT STATUS
NRC Lead Communicator: **PM ___ or _____**	**Status:** **Radiological safety issue_____** **Grid status_____** **Emergency diesel generator status_____** **Station blackout power supply availability_____** **Equipment out of service_____** **Other anomalies_____** **Once sufficient data have been obtained proceed to step 4**

Notes	STEP 4: NOED DETERMINATION
NRC Lead Communicator: **PM ___ or _____**	**<u>Y2K NOED Criteria</u>** **a. Shutdown Required?_____** **b. Grid Stability Issue?** **_____** **c. Safety Decrease Small?_____** **"Does the resident inspector have anything to add?"_____** **"Does the affected NRC Region or Region IV have anything to add?"_____** **Circle type: Y2K / regular / weather** **Circle: determined by HQ / Region 1 / 2 / 3 / 4** **"Does the affected Region concur?"** **_____** **Summarize NOED disposition with the following statement on line:** **"Bridge # _____Plant _____ NOED request is assigned to (name) _____Region/HQ for resolution."** **Proceed to Step 5**

Notes	STEP 5: INSPECTION MANUAL PART 9900 CHECKLIST
NRC Lead Communicator: PM ___ or _____	THE 11 STEPS IN PART 9900 SHOULD BE ADDRESSED, AS APPROPRIATE. (note: a reprint of the Part 9900 Checklist is on the next page) Review of the Part 9900 Checklist is complete Name/Responsible Organization_____ Concur that the review of the Part 9900 Checklist is complete Name/Responsible Organization_____ Proceed to step 6

Notes	STEP 6: NOED DECISION
NRC Lead Communicator: PM ___ or _____	NOED is Approved / Denied Date/Time:_____/_____(EST) Approved / Denied by _____Name/Organization Title _____ Concurred by_____Name/Organization Title _____ Proceed to step 7

Notes	STEP 7: ADMINISTRATIVE CLOSURE OF NOED ACTIONS
NRC Lead Communicator: PM ___ or _____	___ Verify written justification for NOED provided by the licensee within 24 hours (responsible:_____) ___ Followup documentation to the licensee is prepared by NRC (responsible: _____) ___ NOED tracking number is verified to be assigned (responsible: _____)

PART 9900 CHECKLIST

Item	Chk	Remarks
1. The TS or other license conditions that will be violated.		
2. The circumstances surrounding the situation, including root causes, the need for prompt action and identification of any relevant historical events.		
3. The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action.		
4. The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public health and safety and that a significant hazard consideration is involved.		
5. The basis for the licensee's conclusion that the noncompliance will not involve adverse consequences to the environment.		
6. Any proposed compensatory measure(s).		
7. The justification for the duration of the noncompliance.		
8. A statement that the request has been approved by the facility organization that normally reviews safety issues (Plant Onsite Review Committee, or its equivalent).		
9. The request must specifically address which of the criteria specified in Section B is satisfied and how.		
10. If a follow-up license amendment is required, the request must include marked-up TS pages showing the proposed TS changes. and a commitment to submit the actual license amendment request within 48 hours.		
11. For NOEDs involving severe weather or other natural events, the licensee must provide: a. details of the basis and nature of the emergency; potential consequences of forced compliance with the license conditions to the plant and to exacerbation of the emergency situation. The licensee must provide the name, organization and telephone number of the official that made the emergency assessment b. status, and potential challenges to offsite and onsite power sources, and the impact of the emergency on plant safety. c. demonstrated actions taken to avert and/or alleviate the emergency situation, including steps taken to avoid being in the noncompliance, as well as efforts to minimize grid instabilities (e.g., coordinating with other utilities and the load dispatcher organization for buying additional power or for cycling load, shedding interruptible industrial or non-emergency loads).		

November 24, 1999

MEMORANDUM TO: Gary M. Holahan, Director
Division of Systems Safety & Analysis
Office of Nuclear Reactor Regulation

Hubert J. Miller, Regional Administrator
Region I

Luis A. Reyes, Regional Administrator
Region II

James E. Dyer, Regional Administrator
Region III

Ellis W. Merschoff, Regional Administrator
Region IV

Original signed by Brian W. Sheron FOR

FROM: Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

SUBJECT: DELEGATION OF AUTHORITY FOR ALL POWER REACTOR NOEDS PROCESSED DURING THE Y2K TRANSITION

As part of the agency's contingency planning for handling the Year 2000 (Y2K) computer problem, augmented staff has been assigned to the NRC Operations Center and to the regional Incident Response Centers (IRCs). Mr. Holahan has been assigned as the reactor safety team director. Regional administrators have indicated their intent to either be present at their IRC or to be available to their regional IRC teams.

In accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Nuclear Power Plants During the Year 2000 Transition," and its implementing procedures, the director of the reactor safety team and the regional administrators are hereby delegated the authority to grant and deny power reactor NOEDs that are requested by any nuclear power plant licensees, regardless of which region the plant is located, during the Y2K transition (that is, the period December 31, 1999, through January 3, 2000). They may re-delegate this authority, either in writing or by telephone, to an SES-level manager in their organizations.

Authority for granting and denying power reactor NOEDs after January 3, 2000, is delegated as specifically identified in NRC Inspection Manual Part 9900, "Technical Guidance-Operations-Notices of Enforcement Discretion."

cc: Frank Miraglia
Roy Zimmerman
Brian Sheron
Frank Congel
Joseph Giitter

Attachment 1C

STAFFING PLAN

Minimum Staffing for Headquarters Operations Center Power Reactor NOED Team

1. One team manager (SES). Responsible for coordinating and managing the team members and facilitating the decision process, This person may have delegated or re-delegated authority from the Director, NRR, to verbally grant or deny the NOED request.

2. Three senior project managers knowledgeable in the NOED process, TS requirements, and plant safety systems. These members will be responsible for obtaining necessary information from the licensee and resident inspectors, and will assist the NOED team in its evaluation and approval or denial of the NOED.

3. One senior TS specialist to provide understanding and interpretation of TS requirements.

4. Three or four technical branch section chiefs or senior reviewers representing Reactor Systems, Electrical, Instrumentation and Controls, Plant Systems and Probability Risk Assessment branches to develop safety assessments as input to NOED decisions.

Sample Regional Incident Response Center Power Reactor NOED Team Staffing*

(Note: Actual staffing levels and personnel selections for the regions will be determined by the respective regional administrators.)

1. One team manager (regional administrator or designated SES manager) to serve the same function as the Headquarters' team manager. This person will have delegated or re-delegated authority from the Director, NRR, to verbally grant or deny the NOED request.

2. One Projects branch chief to serve the same function as the Headquarters senior PMs.

3. A license examiner or senior resident inspector (SRI) to serve the same function as the Headquarters senior TS specialist. (A member of the regional staff qualified as an operations inspector is acceptable.)

4. A senior reactor analyst, if available.

5. Sufficient DRS branch chiefs and/or technical staff available to represent the same disciplines and serving the same functions as the Headquarters section chiefs.

*NOTE: Region IV will be staffed in accordance with Section 400 of the implementing procedures.

Attachment 1D

EXAMPLES OF POSSIBLE POWER REACTOR NOED SCENARIOS

Example 1: EDG Inoperability

THE EVENT

On December 31, 1999, the plant is operating at normal power level. At 8:00 p.m., due to an unanticipated condition, Train A EDG is rendered inoperable. The NRC is immediately notified by the licensee to provide a "heads-up" due to the impending Y2K transition. TSs require verification within 24 hours that there is no common-cause failure. Otherwise, TSs require surveillance on Train B EDG by starting the EDG.

At 9:30 p.m., the licensee notifies NRC that a potential for a common-cause failure has not been eliminated, and that the Train B EDG surveillance test is now being conducted. At 10:30 p.m., the licensee notifies NRC that during the TS surveillance testing the Train B EDG failed to start. With both EDGs inoperable, TSs require restoration of one EDG to operable status within 2 hours or begin shutdown of the plant. The licensee expects to restore one EDG to operable status within the 2-hour allowed outage time (AOT), that is, by 12:30 a.m. on January 1, 2000. At this time, all offsite circuits are available and the grid is stable.

At 11:30 p.m., the licensee notifies NRC that it was notified by the load dispatcher that, although the grid is currently stable, there is some concern that, because of unanticipated Y2K problems affecting utilities in an earlier time zone, the grid could be adversely affected after midnight, and that operation of the nuclear unit would provide added margin to ensure that grid stability is maintained. At this point, the licensee had also concluded that an additional 2 hours will be needed to complete repairs on one EDG.

The licensee has a 5-megawatt station blackout (SBO) gas turbine that is operable based on a surveillance test completed 3 days ago. The licensee stated that one of the inoperable diesels can be manually started if required, and that equipment operators have been stationed at critical plant locations to ensure that EDG and/or SBO power can be provided. No other equipment is inoperable.

NOED CRITERIA

(a) complying with the license conditions would require a plant shutdown: Yes.

(b) continued plant operation is needed to help maintain a reliable and stable grid: Not at this time, but possible grid problems are anticipated. The licensee provided additional information which the NRC determined was sufficient to satisfy this criterion.

(c) any decrease in safety as a result of continued plant operation is small: Licensee has stated that the decrease in safety is small due to the manual EDG start capability, the strategic placement of equipment operators, and the capability of the SBO turbine.

DECISION

NRC reviewed the licensee's information and agreed with the analysis. Therefore, the NOED was granted.

Example 2: Main Steam Isolation Valve (MSIV) Inoperability

THE EVENT

On December 31, 1999, a BWR plant is operating at 80 percent power level. At approximately 9:00 p.m., due to leaking nitrogen, the licensee declares one MSIV inoperable, and immediately notifies NRC of the issue. The backup motive force for MSIV closure is provided by a hydraulic source with Class 1E power. TSs require restoring the MSIV to operable status within 8 hours or initiate a plant shutdown. At 11:00 p.m., the licensee determines that restoration of the nitrogen supply will be completed within 10 hours from the declaration. The licensee requests a NOED to extend the AOT to 10 hours instead of 8 hours.

The licensee stated that both EDGs are operable. In addition, there are no historical problems with the MSIVs at this site. The 2.5-megawatt SBO diesel is operable based on a surveillance test completed 14 days ago, and can provide power to the backup MSIV control system. No other equipment is inoperable. Plant staff has been significantly augmented due to the Y2K transition, and is stationed throughout the plant in critical locations to ensure rapid response to requests. The licensee was notified at 10:30 p.m. by the load dispatcher that the grid is currently stable, and that there are no anticipated Y2K concerns.

NOED CRITERIA

(a) complying with the license conditions would require a plant shutdown: Yes.

(b) continued plant operation is needed to help maintain a reliable and stable grid: Not at this time, and no grid problems are anticipated.

(c) any decrease in safety as a result of continued plant operation is small: Licensee has stated that due to the short (2 hour) extension of the AOT, the robust backup power and actuation capability, and the augmented staff, the level of safety is maintained.

DECISION

NRC staff and management have reviewed the licensee's information, and agree with the analysis. However, this request does not conform to the Y2K NOED criteria due to a negative response to item (b). After further consideration, the licensee modifies the request to a "regular NOED." On this basis, the NOED is granted.

Example 3: Offsite AC Power Partial Loss

THE EVENT

On December 29, 1999, a west coast plant is operating at 80 percent power. At 2:00 a.m. (all times are Pacific time), one required offsite circuit became inoperable due to the failure of a switchyard component. TSs require restoring the offsite circuit within 72 hours. The AOT expires at 2:00 a.m. on January 1, 2000. After evaluating the situation and due to the pending Y2K transition, the licensee notifies NRC at 8:00 a.m. on December 29 that restoration should be completed within the AOT.

At 6:00 p.m. on December 31, the licensee determines that it will not be able to complete the required action by 2:00 a.m. on January 1 because a replacement part, which previously passed all pre-installation tests, failed during post-maintenance testing. The licensee promptly gives the NRC a "heads-up" phone call, and then at 9:30 p.m. on December 31, after diagnosing the failure, requests a NOED to extend the AOT from 72 hours to 96 hours to complete the required action. During this call, the licensee stated that, at 9:15 p.m. on December 31, the load dispatcher told the licensee that, although the grid is currently stable, there is some concern that, because of unanticipated Y2K problems affecting utilities in the eastern time zone, the grid could be adversely affected after midnight, and that operation of the nuclear unit would provide added margin to ensure that grid stability is maintained.

The licensee stated that both EDGs and the 1.2-megawatt SBO diesel are operable based on recent surveillance tests. No other plant equipment is inoperable. Extra auxiliary and reactor operators are on site in anticipation of the Y2K transition.

NOED CRITERIA

(a) complying with the license conditions would require a plant shutdown: Yes.

(b) continued plant operation is needed to help maintain a reliable and stable grid: Not at this time, but possible grid problems are anticipated. The licensee provided additional information which the NRC determined was sufficient to satisfy this criterion.

(c) any decrease in safety as a result of continued plant operation is small: Licensee has stated that the decrease in safety is small due to the capability of the EDGs and the SBO diesel, and the small requested increase in the AOT from 72 hours to 85 hours.

DECISION

NRC staff and management have reviewed the licensee's information, and agree with the analysis. Therefore, the NOED is granted.

Example 4: Loss of Vital DC Power

THE EVENT

On December 31, 1999, at 11:00 p.m., a Class 1E Train A DC system ground alarm is received. The licensee declares the DC bus inoperable. TSs require restoring the DC system within 2 hours or be in Mode 3 within 6 hours. The DC ground fault clearing procedure calls for de-energizing each circuit one at a time and would cause one train of safety system inoperability. The licensee promptly notifies NRC of the problem and, at 11:30 p.m., after preparing a recovery plan, requests a NOED for extending the AOT from 2 hours to 8 hours.

The licensee stated that the location of the ground has not been determined yet, and that the plant has experienced several other ground faults in different systems during the past 3 months and all have been repaired within 8 hours. Both EDGs and the 0.6-megawatt SBO diesel are operable. The load dispatcher just notified the licensee that the grid was stable and no problems were anticipated due to the significant margin.

NOED CRITERIA

(a) complying with the license conditions would require a plant shutdown: Yes.

(b) continued plant operation is needed to help maintain a reliable and stable grid: No. However, the licensee, in anticipation of the Y2K transition, wants to be in a position to support the grid.

(c) any decrease in safety as a result of continued plant operation is small: Licensee has stated that the decrease in safety is small due to the capability of the EDGs and the SBO diesel, the current staffing level at the plant, and their experience with several similar problems in recent months.

INITIAL DECISION

NRC staff and management have reviewed the licensee's information. Because there are no current or anticipated grid issues, a Y2K NOED cannot be granted. In addition, because there is a decrease in safety, a "regular NOED" may not be appropriate. Therefore, the NOED is denied.

SUBSEQUENT EVENT AND FINAL DECISION

At 12:10 a.m., the licensee is notified by the load dispatcher that several fossil units have tripped. Although the grid is stable, margin has been significantly decreased and the dispatcher has requested the unit to stay at power if possible. The licensee immediately calls NRC and states that the unit is still operating. The licensee is trying to complete the repair within the AOT, but still anticipates requiring the additional 6 hours previously requested. They are asking the NRC to reconsider their previous request. NRC evaluates the new information and agrees with the licensee that the conditions for a Y2K NOED are met. Therefore, this followup request for a NOED is granted.

ATTACHMENT 1: IMPLEMENTING PROCEDURE TO BE ATTACHED HERE

NRC-NEI MEETING ON YEAR 2000 SOFTWARE ISSUES FOR NUCLEAR POWER PLANTS

October 7, 1997

LIST OF ATTENDEES

Name	Organization
William F. Asen	NUSMG Program Manager
Terry M. Baxter**	NEI/Union Electric Co. Manager
George W. Busch**	GPU Nuclear, Inc. Manager
Rick Cowles	Self
Sidney Crawford	Self
James W. Davis	Nuclear Energy Institute
Patrick E. Fitch	Self & SEMA, Inc.
H. M. Fontecilla	Virginia Power, Arizona Public Service
Wayne H. Glidden**	Duquesne Light
Allen Hansen	NRC/NRR/PD3-3
Anne P. Houck**	Duke Energy
John Jolicoeur	NRC/AEOD
Debbie LaPay	Westinghouse
Arnold E. (Moe) Levin*	NRC/IRM
Morgan D. Libby	NUSMG
Richard H. Lomax**	Nebraska Public Power District
Melinda Malloy	NRC/NRR/DRPM/PGEB
Jerry L. Mauck	NRC/NRR/DRCH/HICB
Steve Mixon	NUS Information Services
William Olsen**	Quality Systems, Inc.
Gary Purdy	NRC/NMSS/INMS
Judith H. Schulte**	Duke Energy
Deirdre Spaulding	NRC/NRR/DRCH/HICB
R. Lee Spessard	NRC/NRR/DRCH
Hugh L. Thompson*	NRC/DEDR
John Voglewede	NRC/IRM
Jared S. Wermiel	NRC/NRR/DRCH/HICB

* Partial attendance
** NUSMG task force

Abbreviations

AEOD	Office for Analysis and Evaluation of Operational Data
DEDR	Deputy Executive Director for Regulatory Programs
DRCH	Division of Reactor Controls and Human Factors
DRPM	Division of Reactor Program Management
HICB	Instrumentation and Controls Branch

IMNS	Division of Industrial and Medical Nuclear Safety
IRM	Office of Information Resources Management
NEI	Nuclear Energy Institute
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NUSMG	Nuclear Utility Software Management Group
PD	project directorate
PGEB	Generic Issues and Environmental Projects Branch
SEMA	Systems Engineering and Management Associates

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NRC-NEI MEETING ON "YEAR 2000" SOFTWARE ISSUES

Rockville, MD
October 7, 1997

AGENDA

1.	Introduction of Attendees	All
2.	Purpose of Meeting	NRC Staff
3.	Description of Update to ERDS	AEOD
4.	Description of NEI/NUSMG Year 2000 Task Force Efforts	NEI/NUSMG
5.	NRC Plans for Confidence in Licensee Year 2000 Efforts	NRC Staff
6.	Summary and Future Actions	NRC Staff/NEI

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This material is based on a presentation to
the staff of the Nuclear Regulatory Commission
by the Nuclear Energy Institute
during a meeting on October 7, 1997

Year 2000 and Nuclear Utilities

Safe and On-Line

A contribution to the Nuclear Utility Industry
by
the Nuclear Utilities Software Management Group
and
the Nuclear Energy Institute

Setting the Stage

- Fall 96 - Y2K made a NUSMG Issue by Steering Committee
- May 97 - Y2K takes center stage at NUSMG meeting but more is needed
- July 97 - Special 2 day Y2K meeting
  - significant progress and capability by utilities
  - opportunity for NUSMG to communicate it
  - NEI desire to facilitate
  - committed resources to this Task Force

Producing the Document

- Aug. 25th - first Task Force Meeting
- Sept. 12th - first draft issued
- End of Oct. - distribute to NUSMG Reps. and NEI Administrative Points of Contact
- Nov. 14th - provide full day training for **all** interested parties
- Provide continuing support as requested

Which brings us to today

- This discussion:
  - Present an overview of the draft of our document
  - Discuss the content and answer questions
  - Provide an opportunity for further understanding of concerns and issues
- After the discussion - reflect on the discussions and determine any appropriate additions or changes

---

Features of the Document

- Pooled resources means the best of the best:
  - Awareness - Management and staff
  - Commitment - to the Project and Stakeholders
    - Ownership
    - Participation
  - Manage as a Project
  - Address appropriate software and Interfaces
  - Quality Assure products and processes
  - Document activities and decisions

---

1. Introduction

- This is an Awareness statement to senior management of utilities and their direct reports.
- It expresses the commitment of both NUSMG and NEI to assist nuclear utilities with an important and complex problem

---

2. Purpose and Scope

- Our Purpose is to recommend methods to address the Y2K problem.
- The Scope is broad
  - It fully encompasses safety and all license requirements and commitments
  - It emphasizes the need for nuclear generating units to be on-line through the date rollover

---

3. Definitions

- We have used standard Y2K terminology
- We have used common nuclear terminology

Y2K Ready	Validation
Y2K Compliant	Objective Evidence
Remediation	Interfaces

---

4. Management Plan

- This is more than an IT project - it must be managed as the business would a major component replacement or remediation
- The Project must establish interfaces
- It must receive oversight from management

---

4. Management Plan

Awareness
Sponsorship
Project Leadership
Project Objectives
Project Management Team
Management Plan
Project Reports
Interfaces
Resources
Oversight
Quality Assurance
Implementation Plan

---

5. Implementation Plan

- In the Initial Assessment we:
  - Ensure Awareness
  - Establish the inventory
  - Categorize according to "type"
  - Classify according to "importance"
  - Prioritize the detailed evaluations
  - Revise estimates and plans

---

5. Implementation Plan

- In the Detailed Assessment we:
  - Establish vendor responsibility
  - Evaluate utility-responsible software
  - Evaluate interfaces
  - Plan the Remediation effort
  - Notify affected parties

---

5. Implementation Plan

Awareness

Initial Assessment

Detailed Assessment

Remediation

Validation

Notification

5.2 Initial Assessment

Inventory

Categorization

Classification

Prioritization

Adjust Plans

5.3 Detailed Assessment

Vendor Evaluation - Testing

Utility-Owned Evaluation - Testing

Interface Evaluation - Testing

Remediation Planning

---

6. Quality Assurance

- Quality Assurance measures are an integral part of the process
- QA provides a barrier that prevents software from compromising safety or operability
- Existing QA processes are acceptable

---

7. Regulatory Considerations

- 10 CFR 50.59
- NRC Safety Evaluations
- Reportability Evaluations
    - Part 21, 50.72, 50.73
- Operability Evaluations
- Changes to Safety Analysis Report
- Emergency Response Systems
- Financial and Legal Obligations

---

8. Documentation

- Imparts expectations
- Provides Objective Evidence
- Facilitates oversight and management
- Records the bases of management and technical decisions made

---

8. Documentation

Establishes Requirements

Captures Management Records

Captures Vendor Records

Inventory Information

Checklists

Certificates of Completion

Retains Records

The continuing commitment of NEI and NUSMG

- NEI will provide on-line information exchange mechanism for nuclear utilities
- NUSMG will provide training and consultation services to nuclear utilities
- Both will ensure consistent information is communicated to all nuclear utilities
- Both will encourage utility implementation of the Y2K Document

---

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July 19, 1999

MEMORANDUM TO: William D. Travers
Executive Director for Operations

FROM: Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

SUBJECT: PRELIMINARY REPORT ON NUCLEAR POWER PLANT YEAR 2000 READINESS

This memorandum provides the staff's preliminary report on nuclear power plant (NPP) year 2000 (Y2K) readiness. The report integrates the results of regional staff reviews (conducted at each NPP site during the April-June 1999 period) with the initial Headquarters staff review of licensee responses to Generic Letter (GL) 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." Additional review and followup activities are continuing; a final report is expected in the form of a NUREG and will be issued by August 31, 1999. This preliminary report, as well as the final NUREG, will be placed in the Public Document Room and on the NRC's Y2K Web site.

Regional staff reviews of licensee Y2K activities were conducted at each NPP site during the April-June 1999 period following the guidance of Temporary Instruction 2515/141, "Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants." The reviews were conducted to verify that licensee Y2K programs and processes were being implemented consistent with the industry guidance in Nuclear Energy Institute/Nuclear Utilities Software Management Group(NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," both of which have been found acceptable by the staff. Because of the timing of the regional reviews, there were instances in which licensee activities had not progressed sufficiently for the NRC staff to conclude that all activities were being implemented in accordance with industry guidance.

On the basis of its review of the 103 operating power plant Y2K programs, the staff concludes that licensees for 89 nuclear power plants have implemented Y2K programs consistent with industry guidance. As described in the report, the staff has identified 14 plants at which a followup review will be conducted to provide a high level of confidence that licensee Y2K activities have been implemented consistent with industry guidance. Licensees for 10 of the 14 plants reported that they had completed their Y2K readiness activities by July 1, 1999. The followup onsite reviews are expected to be completed by August 13, 1999.

As reported in Press Release 99-138, issued on July 7, 1999, the NRC received responses to GL 98-01, Supplement 1, from licensees for all 103 operating nuclear power plants indicating that there are no Y2K-related problems that directly affect the performance of safety systems.

CONTACT: M. Waterman, NRR/DE
415-2818

Licensees for 68 of the 103 plants reported that all their computer systems and digital embedded components that support plant operations are “Y2K ready.”

Licensee reports also indicated that to be fully Y2K ready, licensees for 35 plants have additional work to complete on a few non-safety systems or components. These licensees provided scheduled completion dates for their plants. Of these 35 plants, 18 have systems or components that could affect power generation (e.g., digital feedwater controls and core performance monitoring systems). The remaining17 plants have systems or components that do not affect power generation (e.g., plant simulators and administrative systems that track maintenance activities). None of the remaining work in the 35 plants affects the ability of a plant to shut down safely, if necessary. Typically, completion of Y2K work after July 1, 1999, is necessary because of a scheduled plant outage in the fall of 1999 or because the licensee is waiting for delivery of a replacement component. The staff is committed to independently verify the completion of the remaining Y2K items at each of these 35 plants.

All licensees are expected to be Y2K ready before December 31, 1999. If, by September 30, 1999, it appears that Y2K readiness activities will not be completed in advance of the December 31, 1999 – January 1, 2000, transition, NRC will take appropriate action, including the issuance of shutdown orders, if warranted.

Attachment: Preliminary Report

PRELIMINARY REPORT ON NUCLEAR POWER PLANT YEAR 2000 READINESS

July 16, 1999

Contact:

Michael E. Waterman
Electrical & Instrumentation and Controls Branch
Division of Engineering
Office of Nuclear Reactor Regulation

ATTACHMENT

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PRELIMINARY REPORT ON NUCLEAR POWER PLANT YEAR 2000 READINESS
July 16, 1999

Executive Summary

This report integrates the results of the staff's onsite Year 2000 (Y2K) readiness reviews of 103 nuclear power plants (NPPs) and licensee responses to Generic Letter (GL) 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants." The onsite reviews were based on acceptance criteria developed from the staff-accepted industry guidance provided in Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness," and NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning."

On the basis of the staff's onsite reviews of licensee Y2K readiness activities at the 103 operating U.S. NPPs, the staff concludes that the licensees for 89 of the 103 NPPs have followed Y2K programs that are consistent with industry guidance. By August 13, 1999, the staff will conduct followup reviews of the remaining 14 plants to verify that licensee Y2K readiness activities are consistent with staff-accepted industry guidance.

Licensee responses to GL 98-01, Supplement 1, indicate that licensees for 68 nuclear power plants have achieved Y2K readiness as of July 1, 1999. Of the remaining 35 operating NPPs, licensees for 18 plants have yet to achieve Y2K readiness for digital systems or components that could affect plant operations. None of these systems or components are part of the safety systems designed to shut down a reactor or activate systems and components required for accident mitigation. Each of these plants has a small number of incomplete items; typically, the licensee is awaiting delivery of a replacement component or a scheduled outage in the fall of 1999. The staff will verify completion of the remaining activities for all 35 plants as Y2K readiness activities are completed. All NPPs are expected to be Y2K ready before the transition from 1999 to 2000.

1.0 INTRODUCTION

This report integrates the initial Headquarters staff review of licensee responses to GL 98-01, Supplement 1, “Year 2000 Readiness of Computer Systems at Nuclear Power Plants,” with the results of regional staff reviews conducted at each NPP site during the April-June 1999 period. Additional review and followup activities are continuing; a final report is being prepared in the form of a NUREG and will be issued by August 31, 1999. This preliminary report, as well as the final NUREG, will be placed in the Public Document Room (PDR) and on the NRC’s Y2K Web site.

Regional staff reviews of licensee Y2K activities were conducted at each NPP site during the April-June 1999 period following the guidance of Temporary Instruction (TI) 2515/141, “Review of Year 2000 (Y2K) Readiness of Computer Systems at Nuclear Power Plants.” NRC conducted reviews to verify that licensee Y2K programs and processes were being implemented consistent with the industry guidance in NEI/NUSMG 97-07 and NEI/NUSMG 98-07, both of which have been found acceptable by the staff. Additionally, as the NRC reported in Press Release 99-138, issued on July 7, 1999, the NRC received responses to GL 98-01, Supplement 1, from licensees of all 103 operating NPPs indicating that there are no Y2K-related problems that directly affect the performance of safety systems. These two sources of information regarding Y2K readiness have been incorporated into in this report.

Section 2.0, “Background,” summarizes the nature of the Y2K problem, the history of NRC activities related to resolution of this problem in the nuclear power industry, and the scope of activities conducted by the staff to verify that licensees will be Y2K ready before the end of 1999. Section 3.0, “Review and Integration Approach,” describes the methodology used by the NRC staff to perform the 66 NPP onsite reviews of licensee Y2K activities and integrates the results of the site reviews with the responses to GL 98-01, Supplement 1. Section 4.0, “NRC Y2K Review Results and Followup Actions,” summarizes the results of NRC staff reviews of licensee Y2K program activities and the licensee responses to GL 98-01, Supplement 1. Section 5.0, “Preliminary Conclusions,” describes preliminary staff conclusions regarding Y2K readiness in U.S. NPPs.

2.0 BACKGROUND

The Y2K computer problem pertains to the potential for date-related problems that may occur in a software system or an embedded digital component. These problems include not representing the year properly, not recognizing leap years, and improper date-based or time-based calculations. An example of a date-related problem is misreading ”00" as the year 1900 rather than 2000, which could cause some computer systems to malfunction. A software system or an embedded component that is determined to be “Y2K compliant” accurately processes date and time data (including calculating, comparing, and sequencing data) from, into, and between the years 1999 and 2000. A software system or an embedded component that is determined to be “Y2K ready” performs its functions correctly, although the system or component is not Y2K compliant.

In NPP safety systems and plant operations systems that use software systems or embedded components, the Y2K problem could cause an event such as a plant trip, or could affect systems that either report post-shutdown plant status or that support emergency data collection

capabilities. Additionally, to the extent that a Y2K deficiency could cause an NPP trip or transient, the resulting loss of electrical generation could introduce an electrical distribution grid instability and a resulting loss of offsite power. Y2K issues can also affect plant support or administrative systems. Most NPP safety systems are analog systems and, consequently, are not affected by Y2K issues.

Since 1996, the NRC has been working with NPP licensees to ensure that NPP systems are Y2K ready before 2000. To ensure that senior level management at operating U.S. NPPs were aware of the Y2K issue, the NRC issued Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," on December 24, 1996. In IN 96-70, the staff described the potential problems that nuclear facility computer systems and software might encounter during the transition from 1999 to 2000. The NRC sent copies of this information notice to all U.S. NPP licensees, fuel cycle facility licensees, and nuclear materials licensees.

In 1997, the NEI took the lead in developing industry-wide guidance for addressing Y2K issues in the nuclear power industry and, with cooperation from the Nuclear Utility Software Management Group (NUSMG), issued NEI/NUSMG 97-07. Subsequently, NEI and NUSMG issued NEI/NUSMG 98-07. In Generic Letter (GL) 98-01 and its supplement, the NRC accepted the guidance provided in NEI/NUSMG 97-07 and NEI/NUSMG 98-07 as appropriate methodologies for addressing Y2K readiness in NPPs.

In GL 98-01, the NRC requested all holders of operating licenses for NPPs to inform the NRC of steps they were taking to ensure that computer systems will function properly by 2000. All licensees responded to GL 98-01, stating that an NRC-accepted program (NEI/NUSMG 97-07 and NEI/NUSMG 98-07) had been adopted, the program addressed both safety-related and non-safety-related systems and components, and the plants would be Y2K ready by 2000. GL 98-01 also required the licensees to confirm that their plants would be Y2K ready, including contingency planning, no later than July 1, 1999. Licensees not Y2K ready by July 1, 1999, were required to provide a status report, including completion schedules for work remaining to be done, to confirm their plants would be Y2K ready by 2000.

Beginning in mid-1998, the NRC audited 12 Y2K programs at different NPP sites. The staff did not identify any Y2K issues that would preclude the audited licensees from achieving Y2K readiness. The information obtained during these audits and from other licensees and industry groups indicated that significant Y2K problems do not exist in those NPP systems that affect the ability to safely operate and shut down NPPs. However, licensees have discovered Y2K problems in non-safety (but nevertheless important) computer-based systems, such as security computers, control room display systems, engineering software, control systems, radiation monitoring systems, emergency response systems, and communications systems.

The NRC issued Supplement 1 to GL 98-01 in January 1999. The scope of this supplement is broader than the scope of the original GL 98-01. The supplemental request for information, which was voluntary and also due by July 1, 1999, expanded the scope of the reporting requirements to include systems that are not addressed by the plant license and NRC regulations but are necessary for continued plant operations.

In March 1999, the NRC expanded its scope of Y2K readiness program reviews to include all operating NPP sites. These 66 site reviews, covering 103 NPPs, were completed by June 30, 1999. As described in Section 4.0, the staff evaluated the reviews and is scheduling followup

reviews for selected plants that had not sufficiently completed Y2K readiness preparations at the time of the site reviews.

During May and June 1999, the staff also conducted six detailed audits of licensee contingency planning activities. In these audits, the staff reviewed approximately 15 to 20 licensee system and component contingency plans, contingency plans for internal facility risks, contingency plans for external risks, and the integrated contingency plan (typically, in the 66 onsite reviews, the staff reviewed 6 contingency plans for software or components). The acceptance criteria for these audits were the same as the acceptance criteria used in the 66 NPP onsite reviews.

By July 1, 1999, the staff had received responses to GL 98-01, Supplement 1, from licensees for all 103 operating NPPs. As described in Section 4.0, the staff reviewed these responses and integrated the results of these reviews with the results of the staff's onsite reviews of licensee Y2K readiness programs.

3.0 REVIEW AND INTEGRATION APPROACH

This section describes the methodology used by the NRC staff to conduct Y2K reviews at each of the 66 NPP sites comprising the 103 operating NPPs and the integration of those review results with the licensee responses to GL 98-01, Supplement 1.

3.1 Site Review Methodology

The NRC conducted reviews at each NPP site. These reviews addressed 452 acceptance criteria (TI 2515/141, Appendix A) that were based on guidance provided in NEI/NUSMG 97-07 and NEI/NUSMG 98-07. A checklist format was used to ensure that the reviews would be conducted consistently at each NPP site. Additional guidance for completing the checklists was provided to NRC reviewers in training sessions and in telephone calls between the reviewers and NRC Headquarters staff.

The checklist is divided into three major areas of Y2K readiness acceptance criteria: (1) planning and initial assessment, (2) detailed assessment, and (3) contingency planning. These three major areas are further subdivided into more specific areas of acceptance criteria, which are shown in the following list:

Planning and Initial Assessment
- Management Planning
- Documentation
- Implementation Plans
- Initial Assessment

Detailed Assessment
- System/Component Detailed Assessment
- System/Component Remediation
- System/Component Testing and Validation
- System/Component Notification

Contingency Planning
- System/Component Contingency Planning
- Contingency Planning for Internal Facility Risks
- Contingency Planning for External Risks
- Integrated Contingency Planning

To review detailed assessment activities, the staff selected a system or a component from each of the following six plant system classes:

- Reactor Protection System/Engineered Safety Features System (including emergency diesel generators)
- Feedwater System/Balance of Plant Systems
- Radiation Monitoring Systems
- Emergency Notification Systems
- Plant Process Computer Systems
- Plant Security Systems

One system or component from each of these system/component classes was reviewed during each NPP onsite review. The one exception to this approach occurred in several of the older plants in which no digital systems or components are used in the reactor protection system or the engineered safety features systems (i.e., there are no potential Y2K vulnerabilities in these systems because the systems use only analog technology). These six classes of plant systems were chosen to ensure that any system or component could be reviewed by the NRC during the plant onsite review, thereby allowing the staff to assess the full scope of each licensee's Y2K readiness program.

3.2 Integration Process

The integration process to develop an overall perspective of licensee Y2K readiness involved a three-step process. The first step involved staff onsite reviews of licensee Y2K readiness activities during the April-June 1999 period using the acceptance criteria checklist described in Section 3.1, above. The second step involved a review of licensee GL 98-01, Supplement 1, responses, all of which were received from the licensees by July 1, 1999. The final step involved integration of the results of the first two steps to determine licensee Y2K readiness and the need for regulatory followup actions. The results of the third step are discussed in Section 4.0.

In the first step, the NRC staff reviewed Y2K readiness programs and implementation progress at each of the 66 NPP sites comprising the 103 operating NPPs. Because of the timing of the onsite reviews, the staff expected to identify instances of incomplete Y2K readiness. Each review involved discussions with the licensee’s Y2K technical staff and reviews of licensee documents and work practices. To ensure consistency in the reviews, the staff developed acceptance criteria in the form of a 452-question checklist, which is described in Section 3.1. These checklists were completed by NRC staff reviewers and forwarded to the Headquarters staff for evaluation and integration with the licensee responses to GL 98-01, Supplement 1. The staff’s onsite review activity was documented in routine Resident Inspector reports.

In the second step, NRC staff reviewed licensee responses to GL 98-01, Supplement 1. In responding to GL 98-01, Supplement 1, licensees provided the expected completion date of their Y2K readiness program and, if the completion date was later than July 1, 1999, the licensee's schedule for completing Y2K readiness activities. Licensee responses to GL 98-01, Supplement 1, are available in the PDR.

In the third step, the NRC staff reviewed the acceptance criteria checklists prepared by the NRC staff reviewers and integrated the results of these reviews with the licensee responses to GL 98-01. The results of this integration process are provided in the following section.

4.0 NRC Y2K REVIEW RESULTS AND FOLLOWUP ACTIONS

The staff compared the results of the acceptance criteria checklist assessments from the onsite reviews with the licensee responses to GL 98-01, Supplement 1, to identify areas requiring additional staff followup actions and reviews. All licensees were following the NRC-approved industry guidance and, at the time of the staff's site review, 89 NPPs were sufficiently complete that the TI 2515/141 reviews were closed. Even though the TI was closed, in some cases, (17 NPPs) a licensee had not completed all Y2K activities at the time of the staff's onsite review (some reviews were conducted in April and early May). For example, the licensee may not have completed remediation of a plant system or a component, or may not have completed some aspect of contingency planning activities at the time of the staff's review. However, the staff found that sufficient work had been completed in related Y2K activity areas such that the staff had a high level of confidence that the unreviewed activities would be completed consistent with industry guidelines. Because the overall implementation progress at the NPP was close to complete, these NPPs will not receive followup reviews.

Fourteen NPPs had not sufficiently completed Y2K activities at the time of the site review. The staff concluded that these licensees were following the industry guidance but that a followup review would be appropriate before closing TI 2515/141. Table 1 lists the 14 plants that will receive followup reviews by August 13, 1999. Licensee responses to GL 98-01, Supplement 1, reported that 10 of these 14 plants were Y2K ready.

Responses to GL 98-01, Supplement 1, indicated that licensees for 35 of the 103 operating NPPs have additional work to complete on a few non-safety computer systems or devices in order to be fully Y2K ready. The licensees provided scheduled completion dates for these plants. Tables 2 and 3 list the NPPs that licensees reported were not Y2K ready on July 1, 1999, the latest scheduled completion dates for Y2K-related activities, the systems requiring Y2K remediation, and the reason for the delay. Typically, completion of Y2K work after July 1, 1999, is necessary because of a scheduled plant outage in the fall of 1999 or because the licensee is waiting for delivery of a replacement component.

Of the 35 NPPs that were not Y2K ready on July 1, 1999, 18 plants have systems or components that could affect plant operations, for example, digital feedwater controls and core performance monitoring systems (see Table 2). The remaining 17 plants have systems or components that do not affect plant operations, for example, plant simulators and administrative systems that track maintenance activities (see Table 3). None of the remaining work at the 35

NPPs affects the ability of a plant to shut down safely, if necessary. The staff will verify completion of the remaining Y2K items at each of the 35 NPPs.

Table 4 lists the 68 plants that have been reported as Y2K ready in the licensee responses to GL 98-01 Supplement 1.

5.0 PRELIMINARY CONCLUSIONS

On the basis of the results of the staff's Y2K site reviews of the 103 operating NPPs and the licensees' responses to GL 98-01, Supplement 1, the following preliminary conclusions are provided:

1. All licensees are following the staff-approved industry guidance of NEI/NUSMG 97-07 and NEI/NUSMG 98-07 to address the Y2K issue. At the time of the staff's initial review, licensees for 89 NPPs had implemented Y2K programs consistent with industry guidance. The staff will conduct followup reviews of the remaining 14 NPPs (see Table 1) to review Y2K-related activities that could not be addressed during the Y2K site reviews conducted by the staff in the April - June 1999 review period.

2. Eighteen NPPs reported systems and/or components that had not been replaced or remediated by July 1, 1999, and could affect plant operations (see Table 2). The staff will verify completion of the remediation activities for these systems and components as they are completed.

3. Seventeen NPPs reported systems and/or components that had not been replaced or remediated by July 1, 1999, and do not affect plant operations but require Y2K remediation (see Table 3). The staff will verify completion of the remediation activities for these systems and components as they are completed.

4. As of July 1, 1999, 68 plants have reported being Y2K ready (see Table 4). All licensees are expected to be fully Y2K ready before the transition from 1999 to 2000.

The results of the staff reviews will be incorporated into the staff's final NUREG report of licensee Y2K readiness activities, which should be issued by August 31, 1999.

Table 1 Plants Requiring TI 2515/141 Followup Reviews

Plant	NRC Region	Areas to Be Reviewed During Followup
Beaver Valley 1 and 2	I	Detailed Assessment, Contingency Planning
Indian Point 2*	I	Detailed Assessment, Contingency Planning
Three Mile Island 1	I	Detailed Assessment
Vermont Yankee	I	Detailed Assessment, Contingency Planning
Summer*	II	Contingency Planning
Prairie Island 1 and 2*	III	Detailed Assessment, Contingency Planning
Arkansas 1 and 2*	IV	Contingency Planning
Cooper*	IV	Detailed Assessment, Contingency Planning
Grand Gulf*	IV	Detailed Assessment, Contingency Planning
River Bend*	IV	Detailed Assessment, Contingency Planning
Waterford*	IV	Contingency Planning

* Plants reporting Y2K Ready as of July 1, 1999

Table 2 Plants With One or More Systems and Components That Could Affect Plant Operations			
Plant	**Systems Requiring Remediation**	**Completion Date**	**Reason for Delay**
Beaver Valley 1 and 2	Plant monitoring and trending computer* Atmospheric radioactive effluent release assessment system Emergency response data system Emergency response facility monitoring and trending computer	9/30/99	Remediation
Brunswick 1	Digital feedwater control system*	11/30/99	Outage dependent
Clinton	Core performance monitoring system* Station security system	9/22/99	Vendor delivery, site acceptance testing, and final installation
Comanche Peak 1	Condensate purification control system* Plant training simulator	11/30/99	Outage dependent
Diablo Canyon 1 and 2	Main annunciator system*	10/31/99	Outage dependent
Farley 2	Turbine electro-hydraulic control system*	12/16/99	Outage dependent
Hope Creek	Fire detection and alarm system* Safety parameter display system Emergency response data system Plant training simulator	10/29/99	Outage dependent
Limerick 2	Core performance monitoring system*	9/30/99	Remediation
Monticello	Core physics monitoring system*	9/ 1/99	Integrated testing

* Systems that could affect plant operations

Table 2 Plants With One or More Systems and Components That Could Affect Plant Operations (continued)			
Plant	**Systems Requiring Remediation**	**Completion Date**	**Reason for Delay**
Peach Bottom 2	Core performance monitoring system*	9/30/99	Remediation
Peach Bottom 3	Digital feedwater control system* Core performance monitoring system* Turbine vibration monitoring system*	10/31/99	Outage dependent
Salem 1	Digital feedwater control system* Overhead annunciator system* Plant computer monitoring and alarm system* Safety parameter display system Emergency response data system Plant training simulator	11/ 6/99	Outage dependent
South Texas 1 and 2	Plant process computer system* Procurement and inventory control system	10/31/99	Ongoing projects to replace obsolescent systems independent of Y2K
Three Mile Island 1	Digital turbine control system* Personnel radiation exposure tracking system Personnel qualification tracking system	10/21/99	Outage dependent
Vermont Yankee	Plant process computer* Site security computer Refueling equipment control system	10/31/99	System on order; installation pending

* Systems that could affect plant operations

Table 3 Plants With Systems and Components That Do Not Affect Plant Operations			
Plant	**Systems Requiring Remediation**	**Completion Date**	**Reason for Delay**
Browns Ferry 2 and 3	Site health physics information management system Site nuclear operations management system Site security check-in process software	10/31/99	Implementation
Comanche Peak 2	Plant training simulator	10/30/99	Remediation
Davis-Besse	Maintenance management system for surveillance tracking	8/ 1/99	Software modifications, testing, and implementation
D.C. Cook 1 and 2	Meteorological information and dispersion assessment system	12/15/99	Installation, test, and verification
North Anna 2	Steam generator blowdown control system	10/29/99	Design change development, installation, acceptance testing
Oyster Creek	Personnel qualification tracking system Personnel radiation exposure tracking system	9/30/99	Remediation
Perry	Meteorological monitoring system	8/ 1/99	Remediation
Sequoyah 1 and 2	Site health physics information management system Site nuclear operations management system Site security check-in process software	10/31/99	Implementation
St. Lucie 1 and 2	Health physics administrative computer system	7/15/99 (7/7/99)*	Replacement

* Telecon with licensee on 7/15/99 indicates that this item was completed on the date in parentheses

Table 3 Plants With Systems and Components That Do Not Affect Plant Operations (continued)			
Plant	**Systems Requiring Remediation**	**Completion Date**	**Reason for Delay**
Salem 2	Radiation monitoring system Safety parameter display system Emergency response data system Plant training simulator	10/29/99	Outage dependent
Turkey Point 3 and 4	Health physics administrative computer system	7/15/99 (7/11/99)*	Replacement
Watts Bar	Site health physics information management system Site nuclear operations management system Site security check-in process software	10/31/99	Implementation

* Telecon with licensee on 7/15/99 indicates that this item was completed on the date in parentheses

Table 4 Plants Reporting Y2K Readiness on July 1, 1999	
Plant Name	**NRC Region**
Calvert Cliffs 1 and 2	I
Fitzpatrick	I
Ginna	I
Indian Point 2	I
Indian Point 3	I
Limerick 1	I
Millstone 2 and 3	I
Nine Mile Point 1 and 2	I
Pilgrim	I
Seabrook	I
Susquehanna 1 and 2	I
Brunswick 2	II
Catawba 1 and 2	II
Crystal River 3	II
Farley 1	II
Harris	II
Hatch 1 and 2	II
McGuire 1 and 2	II
North Anna 1	II
Oconee 1, 2 and 3	II
Robinson 2	II
Summer	II
Surry 1 and 2	II
Vogtle 1 and 2	II
Braidwood 1 and 2	III
Byron 1 and 2	III
Dresden 2 and 3	III
Duane Arnold	III
Fermi 2	III
Kewaunee	III
LaSalle 1 and 2	III
Palisades	III
Point Beach 1 and 2	III

Table 4 Plants Reporting Y2K Readiness on July 1, 1999	
Prairie Island 1 and 2	III
Quad Cities 1 and 2	III
Arkansas 1 and 2	IV
Callaway	IV
Cooper	IV
Fort Calhoun	IV
Grand Gulf	IV
Palo Verde 1, 2 and 3	IV
River Bend	IV
San Onofre 2 and 3	IV
Waterford 3	IV
Washington Nuclear 2	IV
Wolf Creek	IV

U.S. Nuclear Regulatory Commission

Contingency Plan for the Year 2000 Issue in the Nuclear Industry

May 10, 1999

Year 2000 Readiness Disclosure
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I. INTRODUCTION

The NRC is pursuing a comprehensive program for dealing with potential Year 2000 (Y2K) problems. We continue to work with our licensees to ensure that potential Y2K problems have been identified and rectified. Based on progress to date, we have a high degree of confidence that our licensees will complete all of their Y2K efforts by December 31, 1999. NRC completed Y2K remediation of its own systems on February 5, 1999, well ahead of the Office of Management and Budget (OMB) target of March 31, 1999. However, because of the nature of the Y2K issue, it is not possible to be 100 percent certain that all potential problems will be corrected. For this reason, the NRC established a task force to develop a contingency plan for ensuring that public health and safety and the environment will continue to be protected, if unforeseen Y2K problems occur.

In a statement to the Senate Special Committee on the Y2K Technology Problem on June 12, 1998, Chairman Jackson said that the NRC recognizes "the national importance of a broader focus that helps to ensure that potential concerns with electrical grid reliability are identified and resolved." To this end, the task force also explored contingency planning options for responding to regulatory and licensing issues that may result from grid reliability problems.

This contingency plan was originally issued in draft form and placed on the NRC external web site to allow for stakeholder feedback. This modified contingency plan reflects stakeholder comments, which are identified and addressed in Attachment 1. Additional information on NRC's Y2K program, including the NRC Y2K contingency planning effort, can be found on the NRC Y2K web site (http://www.nrc.gov/NRC/NEWS/year2000.html).

II. BACKGROUND

Y2K-induced events are events that arise from a date-related problem that is experienced by a software system, a software application, or a digital device at a key rollover date when the system, application, or device does not perform its intended function. December 31, 1999, to January 1, 2000, and February 28, 2000, to February 29, 2000, are examples of key rollover dates. The nuclear utility industry is engaged in Y2K readiness programs at all nuclear power plant (NPP) facilities to seek out and correct Y2K problems that have any potential to affect facility operations. Despite these efforts, there is some risk of Y2K-induced events. Effective Y2K contingency planning sets up a process for reducing such associated risks. The next section describes how the Y2K issue could affect facilities and other entities regulated by the NRC.

III. PROBLEM STATEMENT

A. REACTORS

1. Commercial Nuclear Power Plants

The electricity production and delivery systems, as two of the more important elements of the North American economic and social infrastructure, must remain dependable during the transition to the year 2000. Every other critical element of infrastructure depends on the availability of an interconnected, reliable supply of electrical power. There is no doubt that cascading or even localized outages of generators and transmission facilities could have

serious short- and long-term consequences. Continued safe operation of NPPs during the transition plays a major role in maintaining reliable electrical power supply systems.

To ensure continued safe operation of NPPs during the Y2K transition and beyond, the NRC has been working with licensees of operating NPPs to achieve Y2K readiness of their facilities before the year 2000. The NRC has issued Information Notice 96-70, "Year 2000 Effect on Computer System Software,"December 24, 1996; Generic Letter (GL) 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," May 11, 1998; and GL 98-01, Supplement 1, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," January 14, 1999. In GL 98-01, the NRC requested that all operating nuclear power plant licensees submit written responses regarding their facility-specific Y2K readiness programs in order to obtain confirmation that licensees are addressing the Y2K problem effectively. All licensees have responded to GL 98-01 stating that they are implementing plant-specific programs based upon industry guidance (Reference B.1) that are intended to make the plants Y2K ready by July 1, 1999. Industry has also prepared guidance (Reference B.2) for Y2K contingency planning which is being used by NPP licensees in developing plant-specific Y2K contingency plans as part of Y2K readiness activities. Both GL 98-01 and GL 98-01 Supplement 1, request a written response, no later than July 1, 1999, confirming that these facilities are Y2K ready. Licensees who are not Y2K ready by July 1, 1999, must provide a status report and schedule for remaining work to ensure timely Y2K readiness.

In addition, NRC audited 12 nuclear power plant licensee Y2K programs (representing a cross-section of type of design, use of computer systems, age of the plants and geographical location) to evaluate the effectiveness of the programs NPP licensees are taking to identify and correct Y2K issues at their facilities. These audits, which represent 42 of 103 nuclear power plant units, were completed in January 1999. Based on the results of these audits, the NRC concluded that the audited licensees were effectively addressing the Y2K problem and were undertaking actions necessary to achieve Y2K readiness in accordance with the guidance in GL 98-01. The NRC staff did not identify any issues that would preclude these licensees from achieving Y2K readiness. These findings are consistent with those recently reported by the Department of Energy in the report prepared by the North American Electric Reliability Council on the status of Y2K readiness of the electric power grid. The NRC is not aware of any Y2K problems in nuclear power plant systems that directly impact actuation of safety functions. Errors such as incorrect dates in print-outs, logs, or displays have been identified by licensees in safety-related devices, but the errors do not affect the functions performed by the devices or systems. Most Y2K problems are in balance-of-plant and other systems such as security systems and plant monitoring systems which support day-to-day plant operation but have no direct functions necessary for reactor safety. These systems are being addressed in the licensee Y2K readiness programs consistent with the industry guidance and GL 98-01 schedule.
Based on the completed audits, the NRC staff noted that licensee Y2K contingency planning efforts have not progressed far enough for a complete NRC review, and, therefore, additional oversight of this area is planned. Over the next few months, the NRC plans to review the contingency planning efforts of six licensees different from those included in the initial 12 sample Y2K readiness audits. These reviews will focus on the licensees'approach to addressing both internal and external Y2K risks to safe plant operations based on the guidance in NEI/NUSMG 98-07.

The staff has begun additional assessment of Y2K programs at all operating nuclear power plants. NRC resident or regional inspectors will review plant-specific Y2K program implementation activities including contingency planning. The inspectors will be using guidance prepared by the NRC headquarters staff who conducted the 12 sample audits. Training in the use of the guidance has been provided and experienced headquarters staff will be available to the resident or regional inspectors for support and assistance during the review as necessary. Headquarters will also provide oversight of these reviews to ensure consistency among the Y2K program implementation activities.

Internal Facility Risks

The Y2K readiness program implemented by each NPP utility is intended to identify and fix software-based items that could degrade, impair, or prevent operability of the facility. Safety-related instrumentation and control systems that perform safety function actuations do not present a Y2K issue because, in the vast majority of NPPs, these systems are analog hardwired and therefore do not rely on software that may be subject to the Y2K problem. In those few cases in which such systems are computer based, the software does not have date-driven functions that may be affected by the Y2K issue. However, there remains some risk that plants could still be subject to a Y2K-induced event that has an effect on facility operations. Examples of such internal facility risks at NPPs are computer-based control systems for feedwater control, turbine control, and generator voltage regulator control; plant process computer; control rod position information system; security computer system; and area radiation monitoring systems. NEI / NUSMG 98-07 provides a methodology for developing contingency plans to reduce the risk of Y2K-induced events. Contingency plans should be developed based on risk, consequences, and possible mitigation strategies.

External Risks

Even if the internal facility risks are small, there are still external risks to consider. External risks arise from conditions, circumstances, or events that are beyond the direct control of facility management. The task force identified electrical grid and telecommunications concerns as the most significant external risk considerations; these and other concerns are discussed further in Section D. A methodology for identifying, analyzing, and managing external risks is available in NEI / NUSMG 98-07.

2. Research and Training/Test Reactors

Research and training/test reactor licensees have established programs to evaluate and correct Y2K deficiencies. Many research reactors will be shut down on January 1, 2000, as the institutions operating them (e.g., universities and laboratories) will be closed for the holiday. Further, these reactors often have passive safety features and low power levels, which ensure minimal potential offsite consequences. In addition, the staff concluded that any research reactor in operation on January 1, 2000, could be readily shut down manually using emergency procedures and existing shutdown systems, even if their operational systems should experience a Y2K problem.

3. Decommissioned or Permanently Shutdown Reactors

The staff is assessing the need for Y2K regulatory oversight at decommissioned or permanently shutdown reactors. Although health and safety issues are not postulated, these facilities may have process control, computers, or administrative support devices susceptible to a Y2K problem.

B. MATERIALS LICENSEES

The Y2K issue could affect NRC's materials licensees in different ways because of the diverse types of work performed by those licensees. For example, medical licensees, radiopharmaceutical manufacturers, and irradiator facilities would be concerned about systems that could affect worker or public health and safety. Fuel cycle facilities would be concerned about systems that could affect the common defense and security, as well as systems that could affect worker or public health and safety. If it is determined that a device has a Y2K problem that affects health and safety, NRC will use generic communications (such as Information Notices) to notify licensees of unsafe devices. Y2K problems could occur in systems developed internally by licensees or consultants, or systems that are acquired from external sources. In an effort to inform materials licensees and fuel cycle facilities of the Y2K issue, NRC has issued one generic letter (Reference A.2) and three information notices (References A.3, A.4, and A.5).

1. Medical Licensees

Internal Risks

For medical licensees, overexposure or underexposure of patients represents the greatest internal Y2K risk. During on-site interviews with licensees and manufacturers, NRC found that devices containing byproduct material (high-dose-rate afterloaders and teletherapy units) appear to be Y2K compliant. However, manufacturers of some treatment planning systems and dose calibrators have found that the devices are not Y2K compliant, but upgrades for these treatment planning systems and dose calibrators are generally available from manufacturers. The NRC does not regulate treatment planning systems and dose calibrators, because they do not contain licensed radioactive material. NRC is working with the Food and Drug Administration (FDA) to determine if there are any health and safety problems associated with medical devices that use byproduct material. In addition, NRC inspectors make Y2K inquiries during each routine inspection. Again, treatment planning systems and dose calibrators have been identified as having Y2K problems. Materials inspectors have indicated that licensees are aware of available upgrades and the licensees will upgrade the systems to be Y2K compliant before the end of 1999. Due to the efforts of licensees, manufacturers, FDA, and this agency, NRC believes that the Y2K risk to patients from medical devices that contain byproduct material is low.

External Risks

For medical licensees, external Y2K risks include lack of supplies and loss of power. Most hospitals stock necessary supplies and have emergency power. Supply shortages would affect hospital operations, but should not have an impact on radiation safety. However, power interruption could be a contributing factor to a misadministration during teletherapy treatment. NRC has identified at least one case in the past where loss of electrical power during a

teletherapy treatment contributed to a misadministration (the patient treatment table moved when the power was off and, following the power restoration, the wrong side of the patient was treated). This misadministration could have been avoided if proper procedures had been followed. With backup power systems and close adherence to procedures, NRC believes that the Y2K risk to patients from medical devices that contain byproduct material is low.

2. Radiopharmaceutical Manufacturers

Internal Risks

For radiopharmaceutical manufacturers, overexposure of workers, release of radioactive material to the environment, product quality, and accuracy of the measured activity represent the greatest internal Y2K risk. During an interview of a large manufacturer of radiopharmaceutical products, the manufacturer indicated that the Y2K issue would not affect worker health and safety or the environment. The safety systems used at the facility are not computer-controlled. Further, the dose calibrators used at the facility are Y2K compliant. The manufacturer believed that the Y2K issue would not affect product quality or accuracy of the measured activity. Due to the use of safety systems that are not computer controlled, and the use of Y2K-compliant dose calibrators, NRC believes that the Y2K risk to workers, the environment, and patients from manufactured radiopharmaceutical products is low.

External Risks

For radiopharmaceutical manufacturers, external Y2K risks include lack of supplies and loss of power. These external factors may lead to a reduction in the production of radiopharmaceuticals. Supply shortages or a stop in production should not have an impact on radiation safety. A loss of power could affect ventilation systems which may lead to higher airborne concentrations of radioactive material. However, procedures are in place to minimize exposure of employees to byproduct materials when ventilation is lost. NRC believes that the Y2K risk to workers, the environment, and patients from manufactured radiopharmaceutical products is low.

3. Irradiators

Internal Risks

For irradiator licensees, protecting worker health and safety represents the greatest internal Y2K risk. NRC has interviewed an organization that operates 12 large irradiator facilities in the United States. During the on-site interview, the licensee indicated that there are no health and safety problems related to the Y2K issue. The interlock systems and source movement systems for the irradiators are not controlled by computers. Currently, NRC materials inspectors make Y2K inquiries during routine inspections of irradiator facilities. During one inspection, the licensee informed NRC that their tote position display is not Y2K ready. The tote position display is not a safety system; the tote system is used to move products through the irradiator. Further, this system is a one-of-a-kind modification made by the licensee. The licensee was authorized by NRC to make the modifications and is updating the display system. Because the safety systems used at these facilities are not computer-controlled, NRC believes that the Y2K risk to workers from irradiator facilities is low.

External Risks

For irradiators, the external Y2K risk is loss of power. For panoramic irradiators, loss of power would cause the totes to stop moving through the irradiator which could lead to a fire involving products within the irradiation area. NRC requires that, if power is lost for more than 10 seconds, the source racks are automatically lowered into a shielded position. Further, the lock to the radiation room door is required to not be deactivated by a power failure. Finally, the irradiator sources are designed and built to withstand the heat generated by a fire. NRC believes that the Y2K risk at irradiator facilities to workers is low.

4. Fuel Cycle Facilities

Internal Risks

For fuel cycle facilities, there have been no identified internal-only Y2K risks. During on-site interviews with three fuel cycle facilities, NRC found that the facilities were aware of the Y2K issue. In addition, NRC inspectors have asked Y2K questions during inspections at all fuel cycle facilities. Based on these Y2K inspections, the facilities were aware of the Y2K problem and were adequately addressing Y2K issues.

A generic letter (Reference A.2) was sent to major fuel cycle facilities which requested written confirmation by December 31, 1998, that their computer systems were Y2K ready and that the facilities can operate safely before and after January 1, 2000. The generic letter also requested that if a facility was not Y2K ready by December 31, 1998, a status report and schedule for remaining work would be sent to the NRC by July 1, 1999. Each fuel cycle facility has responded to the generic letter and stated that they have implemented a Y2K readiness program. No facility stated that they were Y2K ready by December 31, 1998, however each facility has indicated that they will be Y2K ready well before January 1, 2000. The Y2K readiness program implemented by each facility is intended to identify and repair software, hardware, and embedded systems that could degrade, impair, or prevent operability of the facility.

External Risks

For fuel cycle facilities, external Y2K risks include diversion/theft of special nuclear material, for a Gaseous Diffusion Plant (GDP) there is the added risk of lose of heat/off-site power, and exposure to workers from a uranium hexafluoride (UF_6) release during restart. NRC believes the risk of diversion/theft of special nuclear material to be low. The restart of a GDP poses no risk to members of the public. There have been no identified risk-significant Y2K concerns for fuel cycle facilities.

C. INTERNATIONAL

The latest assessment by The President's Council in the Year 2000 Conversion (Reference C.9) concludes that International Y2K activity is significantly lagging and will be the source of

greatest Y2K risk to the U.S. For these reasons, NRC is reviewing existing emergency notification procedures with our international counterparts and coordinating Y2K-related contingency plans, particularly with Mexico and Canada.

D. INFRASTRUCTURE

1. Electrical Grid Concerns

External electrical grid system problems that could arise as a result of a Y2K problem are grid instability, voltage and frequency fluctuations, circuit breaker malfunctions, load fluctuations, and loss of grid control systems. The North American Electric Reliability Council (NERC) has released quarterly reports on the status of Y2K remediation and contingency planning for the North American electric power supply and delivery systems (Reference C.2, C.8, and C.11). With more than 75% of mission-critical components tested through March 31, 1999, findings continue to indicate that transition through critical Y2K rollover dates is expected to have minimal impact on electric system operations in North America. Only a small percentage (i.e., less than 3%) of components tested indicate problems with Y2K date manipulations. Most of the reported problems are what NERC refers to as "nuisance errors," such as incorrect data displays and date-time stamps used for data logging and reporting. According to NERC:

> "In most cases, Y2K does not affect primary device functions related to keeping generators and power delivery facilities in service and electricity supplies to customers." (Reference C.11).

A more detailed discussion of how the Y2K problem could affect the North American electric grid is provided below.

Y2K Threats to the Electric Grid

The North American electric grid consists of four regional electrical grids or Interconnections, as shown in Figure 1.

The largest Interconnection is the Eastern Interconnection which covers the eastern two-thirds of the United States and much of Canada. The Western Interconnection, which essentially covers the western third of the United States and Canada, is the only interconnection with ties to

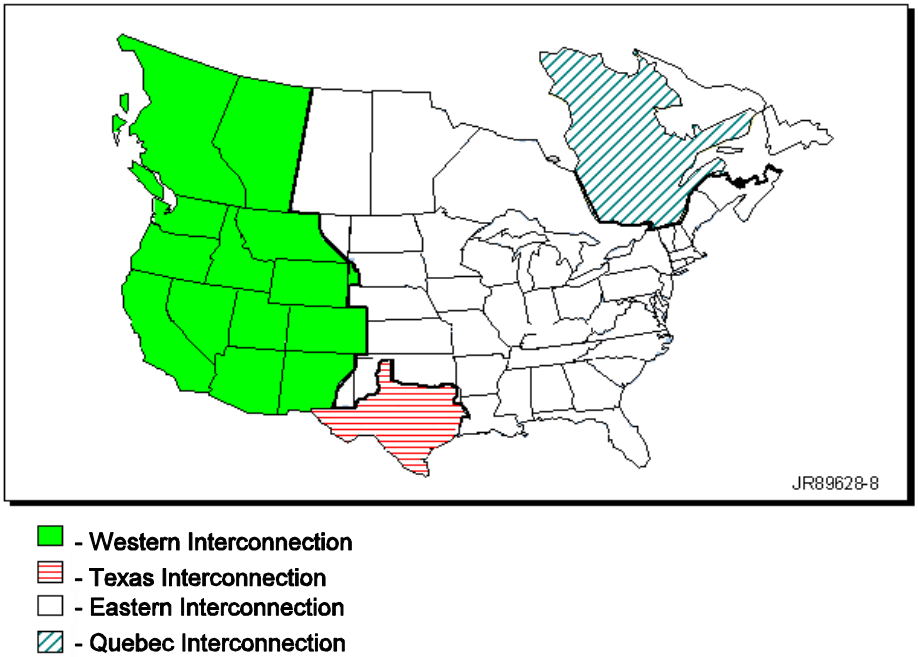

Figure 1. Electrical Grid Interconnections in North America

Mexico.[1] The Quebec Interconnection (sometimes included as part of the Eastern Interconnection) covers the Canadian Province of Quebec. The Texas Interconnection, also known as the Electric Reliability Council of Texas (ERCOT), covers most of Texas. The interconnections are mostly independent of each other, except for ac/dc/ac inter-ties that filter out most disturbances. Thus, in the worst case situation, a wide-spread outage, however unlikely, would be confined to the affected interconnection.

NERC has identified the following four critical areas that pose the greatest direct threat to power production and delivery: Power Production, Energy Management Systems, Protection Systems, and Telecommunications.

Power Production

Power plants must be capable of responding to load supply and demand on the grid during the Y2K transition period. Newer plants with digital control systems may be the most vulnerable.

[1] The U. S. interface with Mexico primarily resides in two power areas of the Western Systems Coordinating Council (WSCC): (1) California-Mexico Power Area which serves the Baja California region with 408 MW transfer capability and (2) Arizona-New Mexico-Southern Nevada Power Area which serves through a Southwestern tie (312 MW transfer capability which is limited by Presidential permit to 200 MW) to Northern Mexico. Given that Mexico represents a small proportion (0.7% and 1.1% respectively) of the transmission load profile for the WSCC operational areas cited above, the staff does not believe that Mexico originated Y2K power systems problems will pose a significant threat to U. S. power production and delivery. The Electric Reliability Council of Texas (ERCOT) does not have interconnections with Mexico.

The control and protection functions that the digital control systems perform often utilize time-dependent algorithms, which can, if uncorrected, lead to unintentional generator trips.

Energy Management Systems

Electric utility control centers monitor power system operations (including generating plants, transmission and distribution systems, and customer loads), retain historical data, and allow for the manual and automatic control of field equipment. The control center's energy management system includes supervisory control and data acquisition systems, automatic generation control systems, energy management applications and databases, and graphical user interfaces. Uncorrected Y2K issues in these systems could result in the loss of monitoring, dispatching, and control functions. In addition, many energy management systems rely on precise time signals that may be provided by global positioning system (GPS) technology. GPS has a unique and pressing problem: the clock used by this system will turn over to 0000 Universal Time Code (UTC) time on August 22, 1999.

Protection Systems

Many newer relay protection devices are digital and are vulnerable to Y2K issues. The concern raised by NERC was the possibility of a common-mode failure in which all relays of a particular model fail at once, causing a large number of coincident outages in transmission facilities.

Telecommunications

Interdependencies with telecommunications continues to be a top priority for the electric industry. As shown in Figure 2, the transmission and distribution of electrical power is highly dependent on microwave, telephone, and very high frequency (VHF) radio communications. Telecommunications systems, in turn, are highly dependent on the availability of electrical power. This mutual dependence directly affects real-time operations and control of electric systems and therefore requires the greatest attention in contingency planning and preparations. The electric industry is working with the telecommunications industry to address this dependency issue. Coordination meetings are taking place to understand the contingency requirements of each sector. Controlled demonstration tests are planned between electric substations and control centers and external telecommunications providers. The lessons from these coordination meetings and demonstration tests will be widely distributed to members of both industries. Additionally, communications will be the focus of electric industry contingency planning and drills.

First drafts of contingency plans have been completed by bulk electric operating organizations and reviewed by North American Electric Reliability Council (NERC) and the NERC Regional Councils. Contingency plans are to be ready by the end of June 1999. The electric power industry of North America conducted a coordinated drill on April 9, 1999 which simulated the partial loss of voice and data communications needed to operate the electric power grids of the United States and Canada. This drill, which was facilitated by NERC, successfully tested backup voice systems and manual procedures needed to support grid operations in the unlikely event of a loss of telecommunications. A second, more comprehensive NERC drill is

planned for September 8-9. The next section describes how Y2K issues are being addressed by the telecommunications industry.

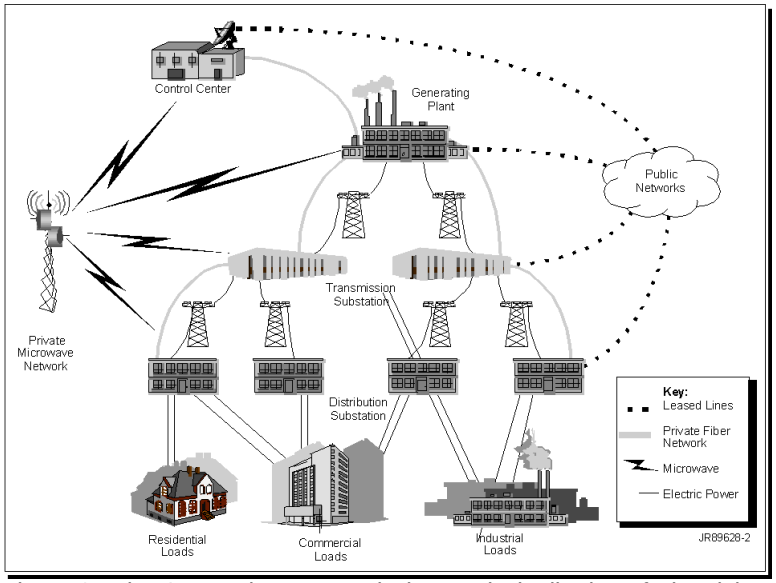

Figure 2. The Generation, Transmission, and Distribution of Electricity Requires Telecommunications Systems

2. Telephone Network

As discussed previously, reliable telecommunications service is crucial to the production and delivery of power. Based on information from the Federal Communication Commission (FCC), the National Communications System (NCS), and the President's National Security Telecommunications Advisory Committee (NSTAC), it appears that there will be little or no interruption of service as a result of the Y2K issue from the major telecommunication providers. This is significant because the major local exchange carriers (LECs), such as Bell Atlantic, SBC, GTE, and U.S. West represent over 95% of the switched and special access lines in the nation. However, many of NRC's nuclear power plant and fuel cycle facility sites are located in rural areas that are serviced by one of approximately 1,400 small and independent telephone companies. Consequently, the task force evaluation of the telecommunications infrastructure devoted special attention to the Y2K status of the smaller telephone companies.

In July 1998, the FCC rechartered the Network Reliability and Interoperability Council (NRIC) to advise the FCC on efforts of the telecommunications industry to prepare for the Y2K transition. A March 1999 report (Reference C.10) issued by the FCC in conjunction with NRIC concludes:

> "Our analysis of the public telephone network indicates that the largest local and long distance carriers are well on their way to being ready for Year 2000. These carriers are expected to be 100 percent ready, including having their contingency plans in place, by the second quarter of 1999."

However, the report further concludes:

> "The remaining carriers, which we define as medium/small, lag behind the large carriers in their remediation and contingency planning efforts and nearly half of the small medium carriers surveyed by the Commission reported not having formal processes for managing the Year 2000. These findings are of concern to us."

The task force has also followed the efforts of the President's National Security Telecommunications Advisory Committee (NSTAC) Year 2000 Subgroup, which has been tasked by the NCS to (1) investigate the Y2K readiness of the information and telecommunications infrastructure as it relates to an enduring continuity of Government and (2) investigate societal implications of potential Y2K outages and contingency planning efforts with respect to private sector operations in the United States and abroad. One of the major conclusions of the September 1998 NSTAC Year 2000 Subgroup status report (Reference C.7), is that "interoperability testing between service providers is critical to preparing the telecommunications infrastructure for the millennium change."

Consequently, the task force has kept abreast of telecommunications industry interoperability test programs. In March 1999, the Telco Y2K Forum, a consortium of the nations largest LECs, completed six months of testing for potential Year 2000 complications that might affect interoperability within the voice and data networks. These tests involved equipment and software common to the Telco Forum members companies–about 90% of the access lines in the nation. Only six Y2K-related anomalies were identified in over 1,900 tests. These six anomalies were subsequently resolved, retested, and subsequently passed. Similar testing between LECs and long distance companies (Sprint, AT&T) conducted under the auspices of the Alliance for Telecommunications Industry Solutions (ATIS) is also being conducted. Of particular note is the fact that the ATIS tests include the Government Emergency Telecommunications System (GETS). GETS, which provides authenticated access, enhanced routing, and priority treatment in long-distance telephone networks, is one of the Government-wide emergency telecommunications initiatives administered through the NCS.

Conclusion regarding telecommunications infrastructure

The task force concludes that wide spread telecommunications outages are highly unlikely, based on information from the FCC and NSTAC and the results of the Telco Y2K Forum and ATIS interoperability tests. More likely are local telecommunications outages, particularly in areas that rely on small and independent telephone companies. Because many of the facilities licensed by NRC are located in rural areas that are served by these smaller telephone companies, the NRC requested the NCS to contact the telecommunications service providers regarding the Y2K compliance of their local telephone office switches. The results of this survey, provided in Attachment 2, suggests that the local telephone switches providing service to NPPs and GDPs will be Y2K compliant. In addition, many utilities have corporate communication networks that they would be able to rely upon as well as the Emergency Telecommunications System (ETS) provided by the NRC. The backbone of the ETS is the FTS 2000 network, which will be Y2K ready by July 1999, according to General Services Administration (GSA). Although it appears that the telecommunications infrastructure that NRC relies on to communicate with NPPs and GDPs will be Y2K ready, the staff is taking

prudent measures to establish a backup emergency communication capability, as discussed in Section V.B.

3. Flooding/Loss of Heat Sink

In NEI/NUSMG 98-07, loss of heat sink was identified as an external event that NPPs should consider for contingency planning purposes. This is a potential concern because systems used to control the amount of water released from a reservoir or hydroelectric dam can rely upon computers or embedded controllers that are susceptible to the Y2K problem. Consequently, the task force examined the potential for a Y2K-induced loss of heat sink (or flooding) that could affect NRC-licensed facilities that are on rivers or flood plains.

The NRC has learned from the U.S. Army Corps of Engineers (USACE) that, although there are potential Y2K problems that could prevent the operation of these systems, there are no identified failure mechanisms that could result in a substantial increase or decrease in the amount of water released. In addition, there is a capability to manually operate the hydroelectric plants or, if necessary, the sluice gates in a manner that ensures that minimum downstream flows are maintained.

Another factor examined by the task force was the need for reliable communication between nuclear power plant operators and the USACE. For example, in January, ice jamming on the Missouri River could result in reduced river water levels. Often when this occurs, affected NPP operators contact the USACE and ask them to increase downstream flows. However, because the chain of events that influences river water levels typically takes place over a number of days, this scenario would only be a concern if there were a prolonged (i.e., at least several days) telecommunication outage. Since this is highly unlikely, the task force concluded that loss of heat sink was not a significant concern for NRC contingency planning purposes.

4. Consumables

Another concern raised by the task force was the potential that certain chemicals, diesel fuel oil, water, food, and other consumables may be difficult to obtain if the Y2K transition results in a breakdown of major infrastructures. As an example of this potential problem, a truck en route to the Turkey Point Plant to deliver water in the aftermath of Hurricane Andrew was diverted by local law enforcement officials for another use. Based on the latest assessment by the President's Council on the Year 2000 Conversion, the infrastructure necessary to support a dependable supply of consumables (chemicals, water, oil and gas, and transportation) is expected to be ready for the Y2K transition. Depletion of consumables is also addressed in NEI/NUSMG 98-07.

IV. COORDINATION

A. INDUSTRY

In the summer of 1998, with oversight from the Nuclear Energy Institute (NEI), the industry formed a Contingency Planning Task Force to provide NPP utilities with a "focused approach" to Y2K contingency planning. The primary product of that task force was a Y2K contingency plan guidance document entitled *NEI/NUSMG 98-07, Nuclear Utility Year 2000 Readiness*

Contingency Planning, dated August 1998. This document, which builds on Y2K readiness programs already in place, provides guidance that can be used by the plant operating staff to develop effective contingency plans for mitigating the potential unanticipated effects of a Y2K problem. The guidance incorporates risks to safe plant operation resulting from potential Y2K problems into the existing emergency procedures and emergency response organization at each NPP. To a large extent, Y2K contingency planning will depend on the specific systems and risks identified as affected by Y2K at the individual plant. However, two generic areas of consideration for contingency planning identified in NEI/NUSMG 98-07 are (1) augmentation of staff and (2) availability of consumables (e.g., emergency diesel generator fuel oil and water chemistry control chemicals).

NEI has indicated that it does not plan additional coordination of licensee contingency planning efforts because of the plant-specific nature of the Y2K issue; however, NEI continues to monitor licensee progress. Individual licensees will work with the NRC as necessary in accordance with their existing emergency response procedures (as they would for any unanticipated operating event) should they experience plant operability concerns due to Y2K problems. The NRC has concluded that the existing emergency response capability at nuclear facilities, supplemented to address the Y2K problem in accordance with NEI/NUSMG 98-07, provides the best approach to licensee contingency planning for this issue.

B. WHITE HOUSE

The importance of addressing the Y2K problem in the U.S. was acknowledged by President Clinton early last year when he established the President's Council on Year 2000 Conversion on February 4, 1998. The Council is made up of representatives from more than 30 major U.S. Federal agencies, including the NRC. The Council Chair is Mr. John Koskinen, Assistant to the President. Each agency on the U.S. Council is responsible for oversight of the Y2K efforts necessary for ensuring availability of the infrastructure sector for which they have statutory responsibility. These "sector coordinators" promote action on the Y2K problem and offer support to public and private sector organizations–both domestically and internationally–within their policy areas. In particular, agencies are working with industry trade associations (which have unique capabilities for communicating with their members about the Y2K problem); individual companies; and U.S. State and local governments. The nine major sector areas covering the provision of critical services are: benefits/payments, communications, electrical power, emergency services, financial services, oil and gas, solid waste, transportation, and water supply. The NRC supports the efforts of the President's Council on Year 2000 Conversion and is an active member of the Council's Year 2000 Energy/Electric sector, Health Care sector, and Emergency Services sector working groups.

C. OTHER FEDERAL AGENCIES

Federal Emergency Management Agency (FEMA)

The NRC is working closely with FEMA on the Y2K problem, supporting regional FEMA Y2K workshops with information on NRC's Y2K program. These workshops are to communicate to regional Federal agencies, States, and local government officials, the status of Y2K problems associated with the major sectors of the infrastructure (transportation, energy, food supplies, health care, etc.) and to assist them in contingency planning efforts. The NRC also is working closely with FEMA on their plans to conduct Y2K workshops for the State and local radiological

emergency preparedness (REP) community. NRC and nuclear power plant licensees will participate in these workshops. NRC is an active member of the Emergency Services Sector (ESS) Working Group for Y2K, which is headed by FEMA. In addition, the NRC is participating in regular Catastrophic Disaster Response Group (CDRG) meetings on the Y2K problem. The CDRG, which consists of all 27 Federal Response Plan (FRP) partners, is chaired by FEMA. Although the Y2K focus for the CDRG is narrower than that for the ESS Working Group, the activities are complementary.

Department of Energy (DOE)

DOE is the principal Federal agency with oversight responsibility for Y2K concerns in electricity supply systems. Because DOE represented the energy sector (oil, gas, and electricity) at the FEMA Y2K workshops, NRC worked closely with DOE to ensure that NRC's Y2K program was accurately reflected. NRC has also confirmed that DOE assets relied upon for a radiological emergency, such as those deployed in support of a Federal Radiological Monitoring and Assessment Center (FRMAC), have been remediated for Y2K.

Federal Energy Regulatory Commission (FERC)

NRC contacted FERC to find out if they were considering Y2K contingency planning related to issues or potential problems associated with electricity supply systems. FERC is not developing such plans, but is relying on DOE Y2K contingency plans to address these issues.

National Communications System (NCS)

The NRC has worked closely with the NCS regarding the National Telecommunications Coordination Network (NTCN) that is being developed to provide for emergency communications in the event of a widespread telecommunications outage. At the request of NRC, the NCS has contacted telecommunications companies that provide service to NPPs and GDPs regarding Y2K readiness. NCS provided formal feedback to NRC on the draft NRC Y2K contingency plan.

U.S. Army Corps of Engineers (USACE)

The NRC has consulted with the USACE concerning the potential for Y2K failures that could affect river water levels and flows.

Department of State (DOS)

The NRC is coordinating its activities regarding the international aspects of the contingency plan with the DOS and with other Federal government agencies, as needed (e.g., Department of Energy).

Government Services Administration (GSA)

GSA has advised the NRC that the FTS 2000 network will be Y2K ready.

D. AGREEMENT STATES

In February 1998, NRC provided information to Agreement States to increase their awareness of the Y2K problem. Through the letter, States were provided information on the nature and scope of the Y2K problem, potential problems for materials licensees, and the actions NRC was taking to encourage NRC materials licensees to examine their computer systems and software. In the letter, we recommended that Agreement States also encourage their licensees to conduct similar examinations to assure they are Y2K compliant. NRC also requested Agreement States to share information with NRC on any Y2K problems identified by Agreement State licensees that could impact NRC, other Agreement States, or other licensees.

To help provide further information to Agreement States, a link was established on the Office of State Programs (OSP) home page directly to the NRC Y2K website to help States obtain access to NRC information. We also provided the Agreement States with information on how to subscribe to the NRC Year 2000 list server that would automatically e-mail information to subscribers as it became available.

On January 26, 1999, all Agreement States were contacted again through the OSP list server referring them to the earlier February 6, 1998, letter, and asking that they be sure to share with us any information on Y2K problems that may have been identified by their licensees. We also asked for information on the status of their efforts to address Y2K issues.

State responses, although limited in number, indicated that Y2K was being addressed through Statewide efforts and anticipated completion before the year 2000. No licensee problems were identified.

In addition, during Management Review Board (MRB) meetings for the Integrated Material Performance Evaluation Program over the past 18 months, the MRB Chair has questioned Agreement State managers about their States' Y2K activities. The managers have indicated that Y2K issues in their programs were being addressed as part of Statewide efforts.

E. INTERNATIONAL

1. Multilateral Coordination

Multilateral coordination takes place in the form of information exchange and coordination at international forums such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA).

International Atomic Energy Agency (IAEA)

At its 1998 General Conference, the IAEA adopted a U.S.-sponsored resolution (drafted by the NRC) to make the IAEA a clearinghouse and central point of contact for IAEA Member States to exchange information regarding diagnostic and remediation actions being taken at NPPs, and at fuel cycle and medical facilities that use radioactive materials, to make these facilities Y2K ready. The resolution also urged Member States to share information with the IAEA on actions being planned or implemented by operating and regulatory organizations and emphasized that Member States should have contingency plans in place well before

December 31, 1999, to address potential problems that may arise at that time at those nuclear facilities.

In response, the IAEA has created a special project to address nuclear Y2K-related safety concerns and contingency planning for NPPs and research reactors, and is in the process of holding several Y2K workshops. The IAEA also conducted a survey of its Member State's Y2K programs in which the NRC participated (http://www.iaea.org/ns/nusafe/y2000/Y2Kinfor.htm)

The U.S. also provided a cost-free expert to the IAEA to assist in the establishment of IAEA Y2K guidelines and contingency planning.

Nuclear Energy Agency (NEA)

In February 1998, the NEA sent a Y2K questionnaire to members of its Committee on Nuclear Regulatory Agencies (CNRA). The responses showed that all participating regulatory bodies were taking aggressive steps with licensees to identify and solve Y2K problems. In August 1998, the NEA finished its work on an international e-mail notification system, enabling CNRA members to rapidly and confidentially exchange Y2K information. The CNRA members are Belgium, Canada, Czech Republic, Finland, France, Germany, Hungary, IAEA, Japan, Netherlands, South Korea, Spain, Sweden, Switzerland, United Kingdom, and United States.

The NEA also organized a Y2K workshop in February 1999, which was also attended by regulators from the former Soviet Union and Central and Eastern Europe. At the workshop the Chairman of the NRC invited countries to participate in a world-wide Y2K contingency plan exercise later this year. Also at this meeting, several regulators expressed an interest in participating in a Y2K early warning system.

NRC is supporting NEA in the development of a Y2K early warning system. Countries in earlier time zones, which will experience any Y2K-related problems before the U.S. does, have been invited to provide information to this system in the quickest possible manner to enable licensees in participating countries to avoid common-cause failures. This effort includes mainly Far Eastern countries, such as Japan, South Korea, and Taiwan, which operate reactors designed by U.S. vendors, as well as some European countries, Canada and Mexico. The Office of International Programs (OIP) developed a prototype user interface for an Internet-based reporting system. At the request of NEA, a number of countries have provided comments on this prototype system. The vast majority of the comments support the proposed system. OIP contacted the World Association of Nuclear Operators (WANO) regarding the proposed early warning system. WANO also identified the potential need for such a system and is interested in participating in its development. This system, referred to as the Y2K early warning system (YEWS), is discussed further in Section V.C.

International Safeguards and Physical Protection

The IAEA Department of Safeguards established a project in 1996 for Y2K conversion activities. The project covers assessment, conversion and testing of the software applications, instrument evaluation software, embedded systems, PC hardware attached to various equipment and computer infrastructure. In addition, the IAEA is working closely with Member

States and their systems of accounting for control of nuclear material and on the conversion of systems used jointly with Member States at nuclear facilities.

In February 1999, OIP participated in an international seminar on Y2K and safeguards and physical protection sponsored by the IAEA. The seminar was attended by 47 IAEA Member States and OIP presented a progress report on the NRC's Y2K efforts. A working group was established and issued recommendations to regulatory authorities and facility operators on how to remediate Y2K problems in the area of physical protection.

2. Bilateral Coordination

NRC's main focus of bilateral contingency planning efforts is on Canada and Mexico. The NRC enjoys close bilateral ties with both countries and special emergency procedures are already in place permitting rapid and redundant communications should an emergency arise. Contingency planning for these countries involves, among other things, the examination of existing procedures and communications channels for Y2K compliance. In addition, Canada and Mexico will participate in YEWS.

Canada

The Atomic Energy Control Board (AECB) of Canada is addressing the Y2K issue at Canadian NPPs and hopes to have all plants Y2K compliant by June 30, 1999. Members of the NRC's continency planning team met with the AECB in December 1998 and again in February 1999 to discuss coordination of their respective Y2K contingency plans.

Mexico

OIP met with the Mexican nuclear regulator (CNS) and is in the process of coordinating contingency plans.

IAEA

NRC and IAEA are coordinating contingency plans for direct NRC-IAEA communications in case of a U.S. nuclear emergency. In February 1999, OIP met with the IAEA's emergency response team and discussed coordination of Y2K contingency plans. Further discussions will be held in May 1999 during the visit of an IAEA emergency response team member to the NRC.

Other Countries

Countries with which the NRC has technical information exchange arrangements are being individually contacted by NRC regarding Y2K issues as part of the ongoing emergency preparedness information exchange. NRC is exploring the possibility of using existing bilateral means of communications as redundant communications channels should the regular international emergency response system fail during the Y2K transition period.

Federal Agencies

NRC is coordinating with the emergency response centers of Federal agencies involved in the international nuclear emergency notification and response system, such as the Departments of State and Energy, the Environmental Protection Agency, the Federal Emergency Management Agency, the National Security Council, and the President's Council on Y2K Conversion.

V. CONTINGENCY PLAN

A. SCENARIO DEVELOPMENT

The task force evaluated a range of possible scenarios. At the lowest end of the spectrum is a situation in which everything goes on as usual during the transition from 1999 to 2000. At the opposite end of the spectrum the task force hypothesized a worst-case scenario involving a widespread telecommunications outage, a complete loss of the North American power grid, and several major incidents at NRC-licensed facilities (e.g., station blackout, loss of ultimate heat sink, loss of feedwater) in conjunction with risk-significant challenges at many other licensed facilities (e.g., loss of offsite power or feedwater transients). The task force agreed on a "planning scenario" that falls somewhere between the two extremes. This planning scenario would encompass events that are beyond our current best estimate of likely consequences, but that would allow the staff to respond to unforeseen possibilities. After careful consideration of the current understanding of Y2K readiness and risk, as described in Section III, the task force established the following planning assumptions:

- Y2K problems will lead to localized electrical grid disturbances and power outages within one or more interconnections. However, there will not be major regional or nationwide electric power outages.

- Local or regional telecommunications outages will occur, but there will not be a complete loss of the public switched network (PSN). Networks associated with Regional Bell Operating Companies (RBOCs), major independent telephone companies, and interexchange carriers (IXCs) will remain functional.

- At least two NRC-licensed facilities will be affected directly or indirectly by a Y2K problem that requires an NRC response (e.g., loss of offsite power).

- Y2K problems will affect several nuclear power plants outside of the United States.

- Unforeseen Y2K problems will place a dozen or more nuclear power plant licensees in situations that depart from a license condition or a technical specification.

B. INCIDENT RESPONSE

Response

The task force determined that the backbone of the contingency plan should be the agency's well-established and well-tested Incident Response Plan. On the basis of the planning

scenario, the agency would enter Standby mode on New Year's Eve 1999. Attachment 3 provides a timeline of when the Operations Center would be staffed in preparation for the Y2K transition. Ordinarily, in Standby mode, the Operations Center technical teams are completely staffed and a member of the Executive Team leads the agency's response. To prepare for potential Y2K problems, a staffing plan has been developed. The details of this plan are provided in Attachment 4.

Operations Center Readiness

The NRC Operations Center relies on three major interrelated systems to ensure the timely flow of information during an emergency: the Emergency Telecommunications System (ETS), the Emergency Response Data System (ERDS), and the Operations Center Information Management System (OCIMS). ETS is the telecommunications network that NRC relies on for voice and data communication between the NRC Operations Center and the emergency response facilities (control room, technical support center, emergency operations facility) associated with every NPP and major fuel cycle facility. ERDS is a real-time data system that allows safety-related information to be downloaded from plant computers at all commercial NPPs. OCIMS is the primary means of creating, storing, sending, and retrieving information in the Operations Center. All three of these systems are considered mission critical. All of these systems have been remediated and tested for Y2K readiness. Nonetheless, the staff has developed Y2K contingency plans for each of these systems.

Telecommunications Readiness

The ETS communication links to NRC licensed facilities are carried on dedicated lines to the Federal Telecommunications System (FTS) 2000 network as shown in Figure 3.

The FTS 2000 network is essentially separate from the public switched telephone network. The General Services Administration has advised the NRC that the FTS 2000 network will be Y2K ready by July 1999. In addition to the ETS, the NRC may communicate with its licensees via the PSN. As discussed in Section D.2, the NRC has worked with the Office of the Manager, NCS, and the FCC to keep abreast of Y2K developments in the public switched network. We are also working closely with NCS to obtain information concerning the Y2K status of the local central office closest to the NPPs and GDPs. This information is provided in Attachment 2.

Although the NRC is becoming increasingly confident that the telecommunications systems relied on to communicate with NPPs and GDPs will be operable during and after the Y2K transition, several prudent measures are being taken to ensure that communications will be possible for a range of scenarios up to and including a widespread telecommunications outage that affects both the FTS 2000 system and the PSN.

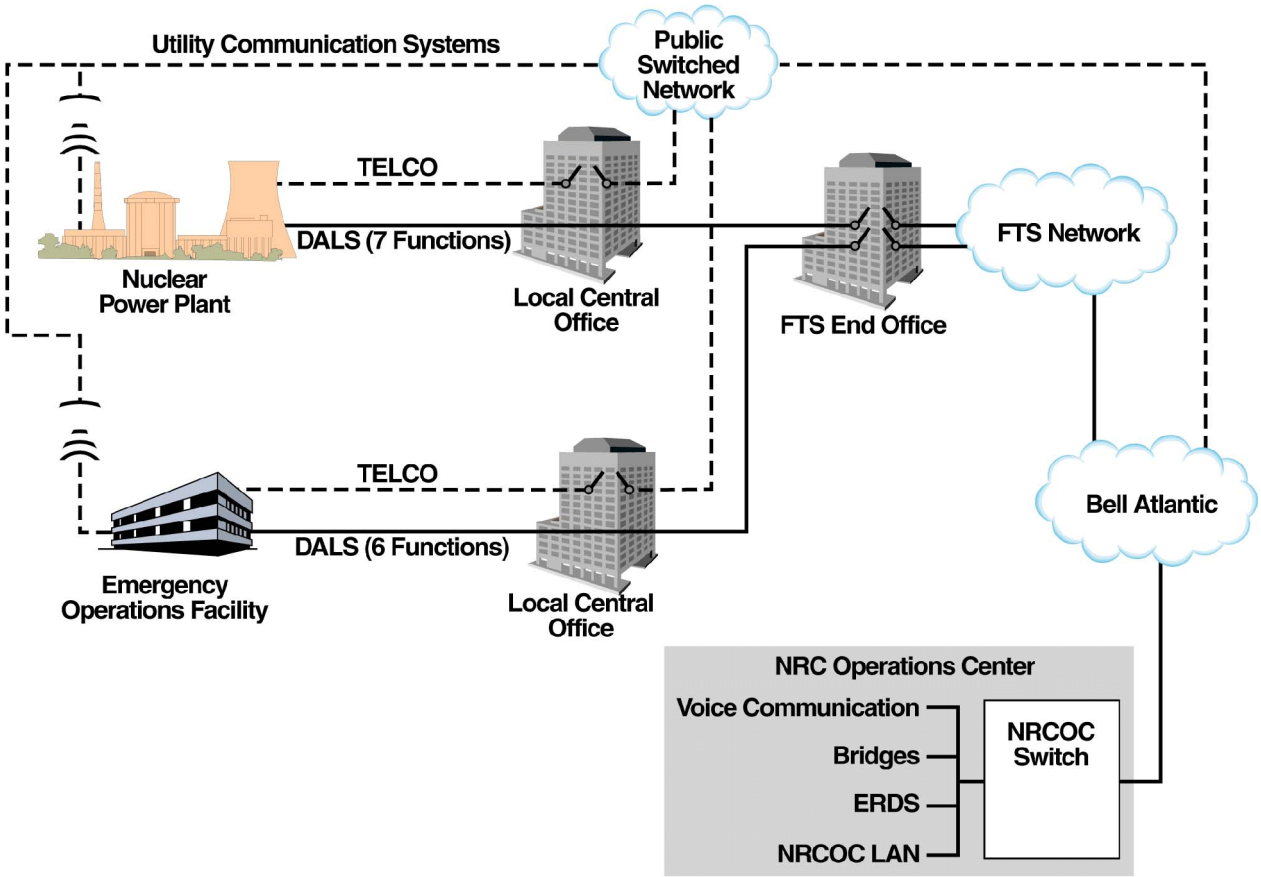

Figure 3. NRC Emergency Telecommunications Systems (ETS)

Local Telecommunications Outage (Single Central Office)

A local outage of a local Bell Atlantic Central Office (CO) because of a failure to properly implement a telephone switch Y2K software upgrade, for example, would be unlikely to result in a complete loss of communications between NRC and its NPPs and major fuel cycle facilities. This is because the NRC's ETS is designed to remain functional following a single fault or failure, barring a fire in the telephone cable room, a major private branch exchange (PBX) failure[2], or some other common-mode failure. The trunk groups from the Operations Center PBX are routed to two physically separate add/drop multiplexers (ADMs) in the telephone cable room where they are added to the Synchronous Optical Network (SONET). [3] To provide for diversity, one of the trunks is routed to a different CO than the others. Another trunk is dedicated to outgoing calls on the FTS2000 network. Thus, by design, the NRC

[2] A limited number of Washington Interagency Telephone System (WITS) lines are also provided in the Operations Center in the event of a PBX power failure.

[3] Because SONET is "self healing" it should not be vulnerable to a single fiber cut.

Operations Center would still be capable of communicating with its licensees even in the event of a local CO outage attributable to a Y2K problem.

Generic Software Problem

If, despite extensive testing, a Y2K software patch for a major switch type was unknowingly susceptible to a Y2K problem, this problem could theoretically cause the failure of all telephone switches or PBXs of a particular type. For example, all of the telephone switches that NRC Headquarters relies on are Lucent 5ESS and could be susceptible to this type of common mode failure. Similarly, a failure to properly remediate network signaling system software could result in widespread telecommunications outages. Although, this appears to be very unlikely, the task force has developed a back-up communication method that will ensure that NRC will be in contact with its licensees during the Y2K transition.

National Telecommunications Coordination Network

Specifically, NRC will be part of the National Telecommunication Coordination Network (NTCN), which is a dedicated network, independent of the public switched network, for coordination of emergency telecommunication issues.

Although the design of this network has not been finalized and is subject to change, the basic concept is illustrated by Figures 4 and 5. As shown in Figure 4, the NRC, and about a dozen other Federal Agencies in the Washington D.C. area, will be connected to the NTCN through a dedicated ringdown line to the National Coordinating Center for Telecommunications (NCC). The NCC, which falls under the NCS Operations Division, is staffed by 17 representatives from the telecommunications industry and government for the purpose of responding to telecommunications requests during emergencies. The NRC link to the NTCN will be a stand alone phone in the NRC Operations Center. A conscious decision was made not to tie the NTCN into the Operations Center PBX out of concern that an unknown Y2K-related software problem with the Fujitsu 9600M PBX could theoretically render this back-up system ineffective. As shown in Figure 5, the ringdown lines to the NCC from the participating Federal Agencies will conceptually have the capability to be bridged to a number of other telecommunications resources including the FTS, the PSN, and mobile satellite phones. Also, access to the Alerting and Coordination Network (ACN), which consists of private telecommunications company assets, provides a diverse and redundant means of communication in the very unlikely event that both the FTS and PSN networks have been affected by a Y2K problem.

In addition, as part of the NRC Y2K Contingency Plan, the NRC is planning to provide one portable satellite telecommunications unit at each NPP and GDP in the United States and to install appropriate satellite telecommunications equipment at Headquarters and in Region IV. This channel of communication will be sufficient to notify NRC of any events. If normal telephone access to the NRC Operations Center is lost, the site could still communicate with the
NRC via either direct satellite communication or via satellite link relayed through the NTCN for emergency reports.

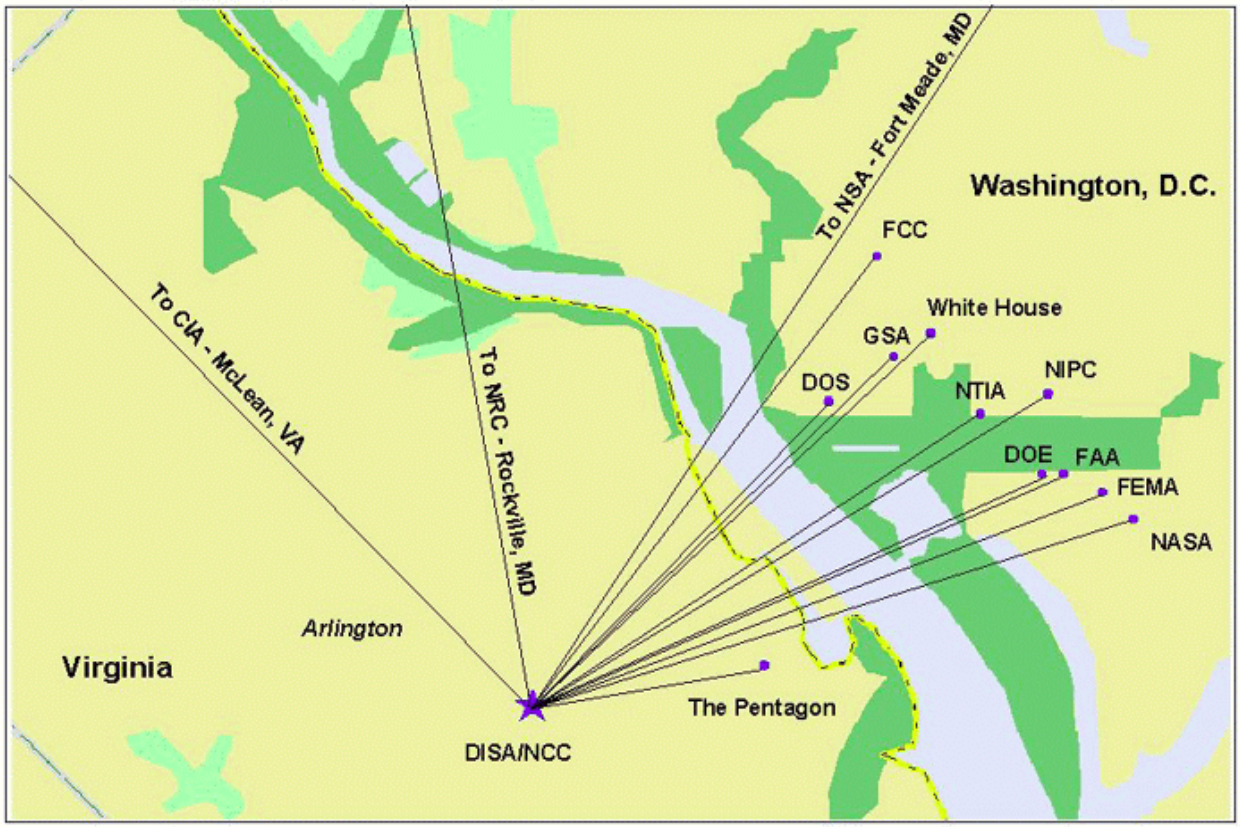

Figure 4. NRC will be a node on the National Telecommunications Coordination Network

Other Emergency Communication Initiatives

NRC participates in a number of Government-wide emergency telecommunications initiatives. Most of these are administered through the NCS. An example of a technology currently in use by NRC is the GETS, which provides authenticated access, enhanced routing, and priority treatment in long distance telephone networks. GETS presumes continued operation of public and Federal telephone networks during national emergencies when the volume of network traffic is expected to be very high. However, this system may not provide protection in the event of a major network outage. NRC has requested the NCS to provide GETS cards to NPP and major fuel cycle facilities for the Y2K transition and beyond.

Another NCS service utilized by the NRC is the Telecommunications Service Priority (TSP) system, which provides priority provisioning and restoration of National Security and Emergency Preparedness (NS/EP) telecommunications services. NS/EP telecommunications services are those that are critical to the maintenance of a state of readiness or the response to and management of any event or crisis that causes or could cause harm. NRC has TSP on many of its critical circuits. NRC also sponsors power companies for TSP service on circuits supporting nuclear power plants.

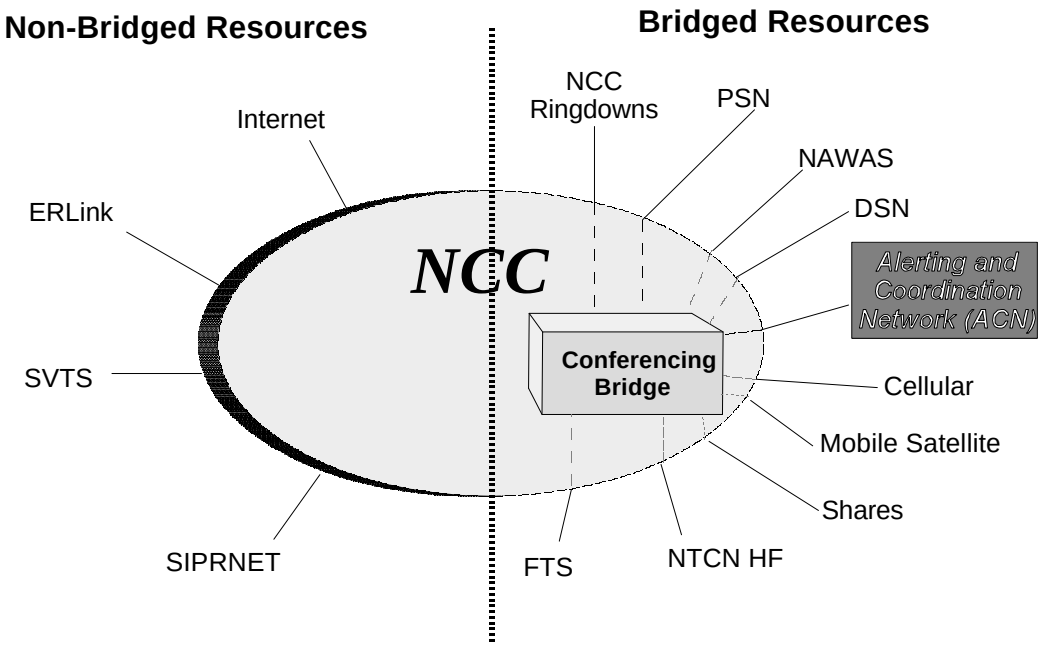

Figure 5. NTCN Resource Architecture Concept

Loss of Normal (PEPCO) Power

The Operations Center also has a dedicated emergency power system, including a dedicated emergency diesel generator and several uninterruptible power supplies. These systems are Y2K ready. The 600 KW diesel generator that provides emergency power to the Operations Center and its support systems has a day tank that holds 100 gallons and a larger storage tank that holds 2000 gallons. Based on worst case load conditions, this supply is adequate to provide for approximately one day of continuous diesel generator operation. A contract will be written to ensure that NRC has priority in receiving fuel oil for replenishing the diesel generator storage tank from a dependable supply.

Environmental Control Systems

The three systems that are relied on to control the Environment of the Operations Center are: (1) Environmental Management and Control System, (2) Tenant Chilled and Condenser Water System, and (3) Air Handling Units System. All three systems have been confirmed to be Y2K ready. If normal power is lost, each system would be powered from the tenant diesel.

Back-up to the Headquarters Operations Center

Because the possibility of a regional communications or electric grid outage cannot be excluded, the staff recommended one additional contingency measure: the capability to rapidly establish a back-up Operations Center. Region IV was selected to perform this function for several reasons:

- Region IV is the only regional office that is not in the Eastern Interconnection. A major grid outage in the Eastern Interconnection could affect Headquarters and Regions I, II, and III.

- Region IV is the only regional office that has telecommunications systems comparable to those at Headquarters. It was for this reason that the back-up to the Headquarters Automatic Notification System was placed in Region IV.

- Region IV is one time zone removed from Headquarters and may be in a better position to respond to major problems on the East Coast that may affect Headquarters.

Staffing

Because NRC's response to an incident at a NPP requires a different type of expertise than an incident at a fuel cycle facility, the current response procedures are oriented to a particular type of facility. However, in order to respond to the Y2K planning scenario, a scaled-down multidisciplinary team of responders, as described in Attachment 4, has been established. The total number of Headquarters responders, approximately 40, represents about half of the number who would typically participate in a full-participation exercise. If needed, the Region IV Incident Response Center (IRC) would be rapidly staffed and could carry out many of the Headquarters functions. Attachment 4 also provides information on the proposed staffing of the Region IV IRC. The staffing plan also recommends that a resident or regional inspector be stationed at every NPP and GDP site. In consultation with the Regional Emergency Response Coordinators, the IRC in each Region will be staffed with a minimum of three responders. The staffing plan will be revised, as necessary, as the detailed Y2K contingency plan implementing procedures are developed.

C. NPP INFORMATION SHARING

The task force determined that the Y2K response team should not only respond to any Y2K-related problems at NRC-licensed facilities, but should also serve as a coordinator of safety-significant Y2K information that could affect our licensees. Ideally, any Y2K issues that may begin to appear in Japan, Korea, and other nations that are on the front end of the International Date Line could be communicated to NRC and its nuclear power plant licensees through the NEA reporting system, YEWS, described in Section IV.E. Likewise, information entered into the YEWS reporting system by NRC, based on information from licensees in the Eastern time zone, would also be useful to NRC licensed nuclear power plants further west. Although, it is unlikely that licensees could take corrective actions on the basis of this information (indeed, it may not be prudent to take short-term actions without thoroughly analyzing the problem), it may assist licensees in implementing contingency measures. NRC would also share this information with the Department of Energy, the Department of State, and other Federal agencies as part of a coordinated Federal communication plan for the Y2K transition. This plan calls for an Information Coordination Center which will support senior

Administration decision makers in addressing emergencies that may arise in the U.S. and around the world, during and after the Y2K transition. The Information Coordination Center, which is being organized by the President's Council on the Year 2000 Conversion, is still in the initial planning stages. The NRC, as a member of the Y2K Domestic Interagency Working Group (IWG), will continue to ensure that our information sharing plans are fully coordinated with the President's Council on the Year 2000 Conversion and other stakeholders.

In developing the "early warning" scenario permitted by time zone differences, the task force made several assumptions concerning the nature of the Y2K problem:

First, the Y2K problem is not limited to the transition that occurs at midnight, December 31, 1999. Other significant dates, including September 9, 1999 (9/9/99) and February 29, 2000. However, the task group concluded that the Y2K rollover is the most significant operating date. This assumption is consistent with prioritization of transition dates by other groups such as the North American Electric Reliability Council. Fortunately, from an electric reliability perspective, New Year's Eve falls on a Friday and January 1 is a Saturday. Demands on the electric system at night and on weekends are normally reduced from peak conditions. If winter weather conditions are not a significant factor, excess generating capability should be available during this critical transition period.[4]

Second, Y2K problems that originate with the midnight, December 31, 1999, rollover may not be apparent at that time. For example, a control circuit that fails to reset for any date after 1999 may not exhibit this failure until a demand is placed on this circuit. This may not occur for days, weeks, or months after the transition date. The task force assumed that the greatest probability of failure, particularly for nuclear power plant systems, would occur shortly (seconds, minutes, hours) after the transition date because such short processing times are involved with these systems. The general probability of failure would decrease with the passage of time, and risk factors involving simultaneous failures or failures involving infrastructure beyond the plant's control would also decrease. In any case, the task force recommends that the greatest emphasis be placed on facilities located in the time zone in which local midnight is occurring.

Third, some Y2K problems involving safety systems may show up quickly enough and clearly enough to be positively identified. This information could be passed along to units containing similar systems in sufficient time to take some positive action. The likelihood of such an event occurring and the usefulness of further distributing such information are clearly debatable. Nevertheless, the provision for early warning due to time zone differences appears to warrant consideration in agency contingency plans.

D. NPP REGULATORY RESPONSE

[4] This conclusion is consistent with the most recent NERC report (Reference C.11).

The NRC has determined that if the agency were to address Y2K problems affecting plant operability within the existing regulatory framework and procedures, continued safe operation of the facility could be unnecessarily adversely impacted. This could potentially result in an adverse impact on public health and safety by forcing an unnecessary plant shutdown and further exacerbate grid stability concerns. The staff is separately seeking Commission approval on a proposed revision to the enforcement discretion policy to address this concern.

Pursuant to the SRM on COMEXM-98-004 issued on July 28, 1998, the NRC's Enforcement Policy (NUREG-1600, Rev. 1) has been revised to allow the staff to exercise enforcement discretion in cases involving severe weather or other natural phenomena. The staff's determination would be based on balancing the broader impacts on public health and safety or common defense and security of not operating against the potential radiological or other hazards associated with continued operation, and a determination that safety will be maintained while exercising this discretion. A similar recognition of the broader public interest in a reliable and stable electrical grid during times when there is potential for Y2K-related challenges to the grid is the basis for this proposed enforcement discretion policy specifically developed for application in Y2K transition or rollover periods. Where an appropriate safety determination can be made, continued plant operation could make a significant contribution to grid stability and reliability, providing necessary reserve power if there are major losses at other generating facilities.

The staff proposes to amend the "General Statement of Policy and Procedure for NRC Enforcement Actions,"NUREG-1600, Rev. 1, by adding Appendix E to the policy. Appendix E will describe the interim enforcement policy to exercise enforcement discretion for certain situations related to Y2K problems.

To ensure that the NRC can support multiple licensee requests for enforcement discretion during the transition from 1999 to 2000, key managers and support staff will be at the NRC headquarters Operations Center during this period. In addition, the NRC Region IV IRC will be staffed to provide backup support to Headquarters, if necessary.

E. EXERCISES / WORKSHOPS

Attachment 5 is a time line of the Y2K exercises and workshops that NRC plans to participate in between now and the Year 2000.

FEMA Exercises

On May 19 and 20, FEMA is conducting an FRP Community Table Top Exercise. This exercise has several purposes:

- Explore issues related to supporting a Federal consequence management response to possible emergency conditions resulting from Y2K.

- Examine the effect of the Y2K environment on the Federal Response Plan.

- Address roles, responsibilities, and authorities of the Federal departments and agencies and the Catastrophic Disaster Response Group (CDRG) members [5].

- Examine processes for information sharing, coordination, and decision-making from the national level response structure.

- Examine coordination processes addressed in the draft FRP Operations Supplement for Y2K.

- Determine the process for arbitrating issues, prioritizing needs, and allocating resources.

Issues identified during this tabletop will be forwarded for review at a National Table Top Exercise tentatively scheduled for September 18 and 25. [6] On the first Saturday of the National Table Top Exercise, CDRG representatives from participating agencies would exercise their role under the FRP in responding to a simulated disaster caused by a Y2K problem. According to FEMA, the second Saturday would be a four hour tabletop exercise headed by the Vice President and would involve the Cabinet Secretaries and the Agency heads.

FEMA is also conducting Y2K contingency planning seminars for State and local radiological emergency preparedness (REP) officials in all nine of their REP regions. Utilities and the NRC have been invited to attend and participate in these seminars, which are expected to start in May.

NRC Exercises

The staff is planning two different types of exercises involving utilities. The first exercise is a table top exercise, scheduled on July 14, that would involve NRC, Baltimore Gas and Electric, the State of Maryland, and Calvert, St. Mary's and Dorchester counties. The purpose of this exercise would be to discuss how contingency plans for each organization would be used in response to a number of scenarios, including loss of telecommunications and loss of offsite power. At least one scenario will involve the transfer of the NRC Y2K response lead from Headquarters to Region IV.

A large scale exercise is tentatively scheduled on October 15. During this exercise, the NRC would test the Y2K contingency plan in its entirety. The headquarters Operations Center, the Regional IRCs and the back-up IRC in Arlington, Texas would be staffed by the same people who have volunteered to staff the centers beginning December 31. There are three major facets of the NRC contingency plan that will be tested:

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[5] The CDRG, composed of representatives from all departments and agencies under the Federal Response Plan, operate at the national level to provide guidance and policy direction on response coordination and operational issues associated with implementation of the Federal Response Plan.

[6] The National Table Top Exercise was originally scheduled for June 19 and 26.

- Incident Response: The planning basis of the NRC Y2K Contingency Plan assumes that there will be two events involving an NRC licensed facility (caused directly or indirectly by a Y2K problem) that will require an NRC response. An example might be a complete loss of off-site power. In this exercise, two or more nuclear power plant licensees and a gaseous diffusion plant will simulate a relatively significant event (i.e., involving an emergency declaration) that the NRC would be required to respond to.

- The planning basis within the NRC Y2K Contingency Plan also assumes that as many as a dozen nuclear power plant licensees may find themselves in a situation where their technical specifications may require them to shutdown, but where continued operation is in the best interest of public health an safety in a broader sense. An example might be the loss of one out of two offsite power sources to the plant caused by grid stability problems. Thus, several utilities will contact the NRC response team requesting enforcement discretion under the Y2K enforcement discretion guidelines.

- The third facet of the Y2K Contingency Plan, Information Sharing, involves taking advantage of the time zone differences. As discussed in Section IV.E., NRC is supporting NEA in developing a Y2K Early Warning System. We intend to test this system during the October exercise by obtaining simulated information from participating countries and sharing it with our nuclear power plant licensees. We will also be testing our back-up communication equipment during this exercise.

This exercise is being planned for October to allow sufficient time for the portable satellite equipment to be procured, deployed, and tested. It will also allow sufficient time for the staff to provide generic communication to our licensees regarding the NRC Y2K Contingency Plan, particularly with regard to the proposed Y2K enforcement discretion guidelines.

VI. REFERENCES

A. GENERIC COMMUNICATIONS

1. May 11, 1998 - NRC Generic Letter 98-01: Year 2000 Readiness of Computer Systems at Nuclear Power Plants.

2. June 22, 1998 - NRC Generic Letter 98-03: NMSS Licensees' and Certificate Holders' Year 2000 Readiness Programs.

3. December 24, 1996 - NRC Information Notice 96-70: Year 2000 Effect on Computer System Software.

4. August 6, 1997 - NRC Information Notice 97-61: U.S. Department of Health and Human Services Letter to Medical Device Manufacturers on the Year 2000 Problem.

5. August 12, 1998 - NRC Information Notice 98-30: Effect of the Year 2000 Computer Problem on Material and Fuel Cycle Licensees and Certificate Holders.

6. January 14, 1999 - NRC Generic Letter 98-01, Supplement 1: Year 2000 Readiness of Computer Systems at Nuclear Power Plants.

B. INDUSTRY GUIDANCE DOCUMENTS

1. October 1997 - Nuclear Energy Institute and Nuclear Utilities Software Management Group Report NEI/NUSMG 97-07: Nuclear Utility Year 2000 Readiness.

2. August 1998 - Nuclear Energy Institute and Nuclear Utilities Software Management Group Report NEI/NUSMG 98-07: Nuclear Utility Year 2000 Readiness Contingency Planning.

C. OTHER RELEVANT DOCUMENTS

1. March 1997 - National Security Telecommunications Advisory Committee, Information Assurance Task Force: Electric Power Risk Assessment.

2. September 17, 1998 - North American Electric Reliability Council: Preparing the Electric Power Systems of North America for Transition to the Year 2000, A Status Report and Work Plan.

3. August 13, 1998 - Nuclear Regulatory Commission: Year 2000 Readiness Audit Plan (for NRC staff review of select nuclear power plants).

4. September 8, 1998 - North American Electric Reliability Council: Year 2000 Contingency Planning and Preparations Guide (Draft).

5. September 1997 - U.S. General Accounting Office (GAO): GAO/AIMD-10.1.14, "Year 2000 Computing Crisis: An Assessment Guide."

6. August 1998 - U.S. General Accounting Office (GAO): GAO/AIMD-10.1.19, "Year 2000 Computing Crisis: Business Continuity and Contingency Planning."

7. September 1998 - The President's National Security Telecommunications Advisory Committee, Network Group, Year 2000 Problem Status Report.

8. January 11, 1999 - North American Electric Reliability Council, North American Electric Reliability Council, Preparing the Electric Power Systems of North America for Transition to the Year 2000. A Status Report and Work Plan, Fourth Quarter, 1998.

9. April 21, 1999 - The President's Council on the Year 2000 Conversion, Second Summary of Assessment Information.

10. March 1999, The Federal Communications Commission in conjunction with the Network Reliability and Interoperability Council, Y2K Communications Sector Report.

11. April 30, 1999 - North American Electric Reliability Council, Preparing the Electric Power Systems of North America for Transition to the Year 2000. A Status Report and Work Plan, First Quarter, 1999.

ATTACHMENT 1
COMMENTS ON DRAFT Y2K CONTINGENCY PLAN
FROM EXTERNAL STAKEHOLDERS

A. One responder (1) wants to shut down all reactors by July 1,1999, due to fear of fraudulent statements regarding Y2K compliance - one responder (2) feels that January 1, 2000, is too late to shut down unsafe reactors – one responder (6) wants reactors to shutdown over the holidays, especially if they are not Y2K compliant - two responders (7 and 11) want to shut down reactors that do not meet Y2K compliance.

Response

To ensure that all operating nuclear power plants remain safe, licensees of operating reactors are required to be in compliance with the terms and conditions of their license(s) and NRC regulations at all times If the Y2K problem leads to a condition that would cause the facility to not be in compliance with the terms and conditions of its license or any NRC regulation, then actions required by the license or regulations will be taken, including, if warranted, shutdown of a plant.

The NRC has been proactive with licensees in order to address the Y2K problem and achieve Y2K readiness of all nuclear power plants. The licensees have been notified of Y2K issues though NRC's generic communication and industry guidance documents. Of particular note is Generic Letter (GL) 98-01, issued on May 11, 1998, which required licensees to respond to the following:

1. Within 90 days of the date of this generic letter, submit a written response indicating whether or not you have pursued and are continuing to pursue a Y2K program, such as or similar to, that outlined in NEI/NUSMG 97-07, augmented appropriately in the areas of risk management, contingency planning, and remediation of embedded systems. If your program significantly differs from the NEI/NUSMG guidance, present a brief description of the programs that have already been completed, are being conducted, or are planned to ensure Y2K readiness of the computer systems at your facility(ies). This response must address the program's scope, assessment process, plans for corrective actions (including testing and schedules), QA measures, contingency plans, and regulatory compliance.

2. Upon completing your Y2K program or, in any event, no later than July 1, 1999, submit a written response confirming that your facility is Y2K ready, or will be Y2K ready, by the year 2000 with regard to compliance with the terms and conditions of your license(s) and NRC regulations. If your program is incomplete as of that date, your response must contain a status report, including completion schedules, of work remaining to be done to confirm your facility is/will be Y2K ready by the year 2000.

All licensees have responded to GL 98-01 stating that they have adopted plant-specific programs that are intended to make plants Y2K ready by July 1, 1999. The second response to GL 98-01 in July 1999, would confirm that the plant is Y2K ready by July 1, 1999.

Licensees who are not ready by July 1, 1999 would provide a status report and schedule for the remaining work to ensure timely Y2K readiness.

Based on the above discussion, it will not be necessary to shut down all operating nuclear plants during the critical Y2K rollover date. However, NRC will determine licensee readiness after the July 1, 1999 responses to GL 98-01 are reviewed. The NRC will take appropriate action up to and including requiring plant shut down, if necessary. Additional discussion on this topic can be found in the response to Docket No. PRM-50-65, a petition for rulemaking from the Nuclear Information and Resources Service.

B. Five responders (7, 8, 9, 11, and 12) state that the 12 audits of reactor licensee Y2K readiness are insufficient and all plants should be audited - one responder (10) feels the material audits should be performed by an independent auditor - five responders (3, 4, 5, 14, and 15) state that identifying the plants most vulnerable to Y2K would not be productive – one responder (6) suggests that the audit program is unacceptable.

Response

One of a number of initiatives undertaken by the NRC staff to address the Y2K problem was the conduct of 12 sample audits of licensee Y2K readiness programs. The NRC staff determined that this approach was an appropriate means of oversight of licensee Y2K readiness efforts because all licensees had committed to the nuclear power industry Y2K readiness guidance (NEI/NUSMG 97-07) in their first response to NRC GL 98-01 and because the NRC staff had not identified any Y2K problems in safety-related actuation systems. The sample of 12 licensees included large utilities such as Commonwealth Edison and Tennessee Valley Authority (TVA) as well as small single-unit licensees such as North Atlantic Energy (Seabrook) and Wolf Creek Nuclear Operating Corporation. Because licensee Y2K programs are corporate-wide, many of the NRC staff audits included more than a single nuclear power plant site since many utilities own more than one nuclear power plant. In all, a total of 42 of 103 operating nuclear power plant units were associated with the Y2K readiness program audits of 12 utilities. The NRC staff selected a variety of types of plants of different ages and locations in this sample in order to obtain the necessary assurance that nuclear power industry Y2K readiness programs are being effectively implemented and that licensees are on schedule to meet the readiness target date of July 1, 1999, established in GL 98-01.

In late January 1999, we completed the 12 audits. On the basis of the audit findings, we concluded that the audited licensees were effectively addressing Y2K issues and were undertaking the actions necessary to achieve Y2K readiness in accordance with the GL 98-01 target date. We did not identify any issues that would preclude these licensees from achieving readiness. These findings are consistent with those recently reported by the Department of Energy in the report prepared by the North American Electric Reliability Council on the status of Y2K readiness of the electric power grid.

The NRC staff is not aware of any Y2K problems in nuclear power plant systems that directly impact actuation of safety functions. The majority of commercial nuclear power plants have protection systems that are analog rather than digital. Because Y2K concerns are associated with digital systems, analog reactor protection system functions are not impacted by the Y2K issue. Errors such as incorrect dates in printouts, logs, or displays have been identified by licensees in safety-related devices, but the errors do not affect the functions performed by the devices or systems. Most Y2K issues are in balance-of-plant and other systems such as personnel access controls and plant monitoring systems, which support day-to-day plant operation but have no direct functions necessary for safe operation of the reactor. These systems are being addressed in the licensee Y2K readiness programs consistent with the industry guidance and GL 98-01 schedule.

We have noted from the completed audits that licensee Y2K contingency planning efforts have not progressed far enough for a complete NRC staff review, and, therefore, additional oversight of this area is planned for the spring of 1999. The NRC staff currently plans to audit

the contingency planning efforts of six different licensees from those included in the initial 12-sample Y2K readiness audits, beginning in May 1999 and ending in June 1999. As stated earlier, licensee Y2K programs are corporate-wide and many utilities own more than one nuclear power plant. Therefore, a total of 18 operating nuclear power plant units will be associated with these six licensee audits. These audits will focus on the licensee's approach to addressing both internal and external Y2K risks to safe plant operations based on the guidance in NEI/NUSMG 98-07.

With regard to the assessment of Y2K programs at operating nuclear power plants, NRC inspectors will review plant-specific Y2K program implementation activities including contingency planning at all U.S. power reactors during the April-July 1999 period. The inspectors will be using guidance prepared by the NRC headquarters staff who conducted the 12 sample audits. Training in the use of the guidance has been provided. The experienced headquarters staff has been available to the inspectors for support and assistance during the review, as necessary. The headquarters staff will also provide oversight of these reviews to ensure consistency among the Y2K program implementation activities. The reviews will allow NRC to check on the progress of all licensees and determine whether any regulatory action is needed. Information from the reviews also will be used in conjunction with status reports NRC has directed its power reactor licensees to provide by July 1.

It should be noted that one or more independent audits are performed by licensees as an integral part of plant-specific Y2K readiness programs.

We agree that attempting to "identify those NPPs that may be most vulnerable to Y2K issues," as discussed in the draft contingency plan, is counterproductive. The paragraph containing that statement has been deleted in the modified plan.

C. Three responders (8, 9, and 12) want to delete the section entitled "Regulatory Response"– five responders (3, 4, 5, 14, and 15) do not believe special provisions for use of 10 CFR 50.54(x) is warranted, but propose that NRC establish a revised enforcement policy that allows timely decisions during the Y2K transition period. Responders (3, 4, 5, 14, and 15) also agree that NRC should provide appropriate support staff to assist licensees in making prompt operability determinations during the Y2K transition period.

Response

The NRC agrees with the comments that support staff should be provided in the NRC Operations Center to assist licensees in operability determinations, and also have the authority to grant enforcement discretion when appropriate. The NRC Operations Center will be staffed and ready to process any request received from a licensee.

The staff disagrees with the comments that Section V.C., "Regulatory Response,"should be deleted from the contingency plans. As stated in the introduction of the contingency plans, it is not possible to be 100 percent certain that all potential problems will be found and corrected successfully when we pass from 1999 into 2000. Therefore, the NRC is planing in advance, via the Contingency Plan and the Interim Enforcement Policy Regarding Enforcement Discretion, to develop procedures and guidelines to assist the staff and licensees during this transition period. These documents will provide guidance to the licensees, staff in the regional offices, and the Office of Nuclear Reactor Regulation on the process for the NRC to exercise enforcement discretion with regard to Limiting Conditions for Operation (LCOs) in power reactor technical specifications or license conditions. It is prudent that the NRC proceeds with these plans for ensuring that public health and safety and the environment will continue to be protected, even if unforeseen Y2K problems occur.

D. Four responders (7, 8, 9, and 12) believe the need for increased power during the weekend of the Y2K transition is not required and that there could be too much power produced during that period.

Response

The NRC agrees with the comment that under normal circumstances the power generated from nuclear power plants, as well as other base-loaded power generation facilities, might not be needed in some areas of the U.S. on January 1, 2000. However, the transition from December 31, 1999, to January 1, 2000, is not considered to be normal circumstances because the Y2K problem has the potential to cause grid disturbances or outages.

E. Five responders (7, 9, 11, 12, and 16) do not consider that it is more important to produce power than protect public health and safety.

Response

Agree. The Commission shares the concern that the Y2K problem not pose an adverse impact on public health and safety. NRC inspectors are reviewing licensee Y2K programs at all U.S. power reactors during the period between April 1, 1999 and June 30, 1999. NRC GL 98-01 requires a written response by July 1, 1999, confirming that all operating nuclear power plants are Y2K ready. Licensees who are not Y2K ready by July 1, 1999, must provide a status report and schedule for remaining work to ensure timely readiness. In July 1999, the NRC staff will review all licensee responses to GL 98-01 and address any questions that may raise concerns. By September 1999, the NRC will determine the need for issuing orders to address Y2K readiness issues, including, if warranted, shutdown of a plant.

The NRC has been proactive with licensees in order to address the Y2K problem and achieve Y2K readiness of all nuclear power plants. (See response to Comment A for additional details of nuclear plant Y2K readiness activities.)

F. Five responders (6, 7, 8, 9, and 12) do not want licensees to operate outside their license during Y2K because they believe it is not justified or safe. Five responders (3, 4, 5, 14, and 15) want the NRC to implement a revised enforcement policy that allows timely decisions during the Y2K transition period. These responders (3, 4, 5, 14, and 15) also suggest that "regulatory response" support staff in the NRC Operations Center during the Y2K transition need to have the authority to rapidly respond to an actual situation and, where appropriate, grant enforcement discretion, based on actual conditions that exist at the time.

Response

The NRC agrees with the comments that knowledgeable staff be available in the NRC Operations Center that have appropriate authority to respond to licensee requests in a timely manner. We also agree that a revised enforcement discretion policy is needed to allow timely decisions during this transition period.

During the rollover from December 31, 1999, to January 1, 2000, the NRC Operations Center will be staffed with knowledgeable projects and technical staff ready to process any request received from a licensee. A small number of staff will also be present in each regional Incident Response Center to facilitate communication with the resident inspectors and to support requests for enforcement discretion, if necessary. With regard to the revised enforcement discretion policy, the staff is preparing for Commission review and approval of an interim enforcement policy regarding enforcement discretion that will provide guidelines for the Y2K transition/rollover period.

The NRC is pursuing a comprehensive program for dealing with potential Year 2000 (Y2K) issues. We have been and will continue working with our licensees to ensure that potential Y2K issues have been identified and rectified. Most, if not all, licensees will be Y2K ready by Fall of 1999. However, it is not possible to be 100 percent certain that all potential problems will be corrected when we pass from 1999 into 2000. Therefore, the NRC has prepared plans to use Enforcement Discretion and has developed procedures and guidelines to assist the staff and licensees during this transition period. These documents will provide guidance to the licensees, staff in the regional offices, NRC Operations Center, and the Office of Nuclear Reactor Regulation on the process for the NRC to exercise enforcement discretion with regard to Limiting Conditions for Operation (LCOs) in power reactor TSs or license conditions. It is prudent that the NRC proceeds with these plans for ensuring that public health and safety and the environment will continue to be protected even if unforeseen Y2K problems occur.

G. Five responders (3, 4, 5, 14, and 15) want to use the wording "embedded devices" instead of "embedded systems."

Response

The staff agrees with the comment on including "embedded devices" in the scope of the Y2K problem. However, the term "embedded systems" will be used since that phrase has been used extensively when discussing the Y2K computer problem. The following discussion taken from the document on the Millennium Problem in Embedded Systems by the Institute of Electrical Engineers, the reference document on Y2K and embedded systems is provided for clarification.

> A general purpose definition of embedded systems is that they are devices used to control, monitor or assist the operation of equipment, machinery or plant. "Embedded" reflects the fact that they are an integral part of the system. In many cases their embeddedness may be such that their presence is far from obvious to the casual observer and even the more technically skilled might need to examine the operation of a piece of equipment for some time before being able to conclude that an embedded control system was involved in its functioning. At the other extreme, a general-purpose computer may be used to control the operation of a large complex processing plant, and its presence will be obvious.
>
> All embedded systems are or include computers or microprocessors. Some of these computers are, however, very simple systems as compared with a personal computer. The very simplest embedded systems are capable of performing only a single function or set of functions to meet a single predetermined purpose. In more complex systems, the functioning of the embedded system is determined by an application program that enables the embedded system to be used for a particular purpose in a specific application. The ability to have programs means that the same embedded system can be used for a variety of different purposes. In some cases a microprocessor may be designed in such a way that application software for a particular purpose can be added to the basic software in a second process, after which it is not possible to make further changes. The applications software on such processors is sometimes referred to as firmware.

H. Three commentors [9, 12, and 13] addressed NRC participation in the National Telecommunication Coordinating Network (NTCN) being planned by the National Communications System. Specific comments in this area include:

- Commentor 13 provided some clarifying remarks concerning the NTCN and suggested adding a discussion of the Telecommunications Service Priority system that NRC subscribes to for its critical telecommunication circuits.

- Commentor 3 stated (and 9 endorsed) the following statement. "We do not know the details of this system, but on the surface (NTCN) it seems to be an excellent idea, and we encourage the NRC to participate in this and other systems that hold promise for telecommunications even if there is an outage in the Washington D.C. area."

Response

At the time that the draft Contingency Plan was completed and made publically available for comment, there was little detailed information available to the NRC on the NTCN. The final Contingency Plan includes more detailed information on the NTCN and how it will be integrated into the NRC's plans for communicating with our licensees during the Y2K transition.

I. Two responders commented on the planning basis in the Contingency Plan.

One responder (2) did not agree with the premise that planning for the middle of two extreme scenarios is sufficiently safe. Instead, she believes that the NRC should plan for the worst-case scenario, since she believes that the infrastructure (electric grid and telecommunications) will not be Y2K compliant. Five responders (3, 4, 5, 14, and 15) recommend that the document continue to emphasize that the planning scenario is not an estimate of expected events.

Response

Based on review of the latest NERC Status Report (April 30, 1999), the latest FCC Y2K Communications Sector Report (March 1999), and the most recent report of the President's Council on the Year 2000 Conversion (April 21, 1999), and on dialog and interaction with numerous Federal and private sector organizations dealing with the Y2K issue, the NRC contingency plan task force does not believe that there will be major infrastructure problems during the Y2K transition. The Contingency Plan has been updated to reflect the latest (as of April 1999) information with regard to the Y2K readiness of the infrastructure, particularly with regard to electric grid reliability and telecommunications. We still believe that the contingency planning assumptions are appropriately conservative.

J. Four responders (4, 5, 14, and 15) recommend removing Attachment 3, "Critical Dates," since it is not relevant to licensee planning.

Response

NRC agrees. This section of the Contingency Plan has been modified.

K. Five responders (3, 4, 5, 14, and 15) are unaware of any DOE Y2K contingency planning efforts for the electricity supply and state that industry is coordinating with the North American Electric Reliability Council (NERC).

Response

The Contingency Plan has been modified to address NRC coordination with DOE. NERC is facilitating the Y2K readiness reporting process for DOE.

L. Responders would like more Y2K exercises and workshops to be conducted.

Response

A new section has been added to the Contingency Plan that addresses NRC plans for Y2K exercises and workshops.

M. Two commentators (6 and 7) provided general remarks. One (6) agreed with the characterization that loss-of-offsite-power(LOOP) was "a major portion of the total plant risk,"taking into account the history of emergency diesel generator (EDG) problems onsite and believed that the NRC should be held accountable for any consequences should the Y2K plan not work. The other (7) expressed apprehension given the recent GAO criticism of NRC oversight of licensee activities (i.e., TIME magazine cover story).

Response

The comments are general remarks that touch upon offsite and onsite electric power system reliability, accountability in the event that problems happen due to Y2K and express apprehension of the Y2K problem as it affects nuclear plants.

To ensure that all operating nuclear power plants remain safe, licensees of operating reactors are required to be in compliance with the terms and conditions of their license(s) and NRC regulations at all times If the Y2K problems leads to a condition that would cause the facility to not be in compliance with the terms and conditions of its license or any NRC regulation, then actions required by the license or regulations will be taken, including , if warranted, shutdown of a plant. The NRC has been proactive with licensees in order to address the Y2K problem and achieve Y2K readiness of all nuclear power plants. (See response to Comment A for additional details of nuclear plant Y2K readiness activities.)

The scope of the licensees'Y2K program covers the emergency onsite power and other emergency power systems at the plant. The NRC audit results to date have verified the licensees'consideration of these systems and have not identified any associated residual Y2K problems. Emergency onsite power is usually provided by diesel generators, which supply electric power to the plant safety systems upon a LOOP from the external power grid. NRC regulations require that the onsite electric power supplies and onsite electric distribution system shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure. By design, normally, a single EDG with its dedicated set of safety system equipment is capable of safely shutting down the reactor and maintaining it in a safe condition.

The operation and maintenance of the EDGs and the other safety-related equipment necessary for the safe shutdown of the reactor are controlled by the plant technical specifications (TSs). Plant TSs require the EDGs to be tested routinely in order to demonstrate their operability and capability of supplying power as needed. This test ensures a high level of readiness and reliability. The plant TSs also require that immediate action be taken to restore the diesel generators to operable status if they are found inoperable. Therefore, although occasional problems have been reported with backup diesel generators, the staff concludes that onsite power provided by diesel generators is a reliable source of emergency power in the case of a loss of offsite power.

Plants are also required to be able to cope with the loss of all ac electrical power to the nuclear plant. This event, called station blackout (SBO), includes the loss of the emergency diesel generators as well as the power from the offsite power grid. The NRC issued 10 CFR 50.63, the SBO rule, in 1988, which requires that nuclear power plants be able to cope with an SBO event for a specified duration. Specifically, the SBO rule required plant-specific coping

analyses to ensure that a plant could withstand a total loss of ac power for a specified duration and to determine appropriate actions to mitigate the effects of a total loss of ac power. The NRC staff has verified that each nuclear power plant complies with the SBO rule. Furthermore, each plant must have SBO procedures in place to restore offsite and onsite power as soon as practical in order to supply power to the shutdown safety systems. This requirement is consistent with our defense-in-depth philosophy for maintaining reactor safety. For the Y2K concern, licensee preparations will include contingency plans to ensure prompt response to Y2K-related issues that might arise.

N. One commenter (10) questioned whether "analog hardwiring" does reduce internal facility risk since it was not designed for that purpose. Also, any interactions between hardwired analog systems and balance of plant systems should be specifically identified or referenced in the Y2K plan.

Response

Independence and separation of safety protection systems from nonsafety systems, whether analog hardwired or digital, are design regulatory requirements (10 CFR Part 50.55 a(h), 10 CFR Part 50, Appendix A, Criteria 22 and 24) which applies to all nuclear power plant instrumentation and control system designs. Any interconnection between an analog safety system and a nonsafety digital data acquisition system like the plant process computer would be through isolation devices and one-way communication pathways to assure the independence and integrity of the safety system. Additionally, during remediation testing of a computer system as part of the plant-specific Y2K readiness program implementation such interfaces are normally tested at the plant site

INDEX OF RESPONDERS
(Attachment 1)

ID NO.	ORGANIZATION	DATE SUBMITTED
NO. 1	ARCABA COMMUNITY PREPAREDNESS	January 25, 1999
NO. 2	PRIVATE CITIZEN – ANN PREHN	No Date
NO. 3	TVA	February 4, 1999
NO. 4	CP&L	February 15, 1999
NO. 5	PECO	February 16, 1999
NO. 6	PRIVATE CITIZEN – ROBIN MILLS	February 4, 1999
NO. 7	MASSACHUSETTS CITIZENS FOR SAFE ENERGY	February 10, 1999
NO. 8	GLOBAL RESOURCE ACTION CENTER	February 5, 1999
NO. 9	PACE	February 4, 1999
NO. 10	PRIVATE CITIZEN – MARVIN LEWIS	January 2, 1999
NO. 11	MAINE GREEN PARTY	February 15, 1999
NO. 12	NIRS	February 4, 1999
NO. 13	NCS	February 12, 1999
NO. 14	NEI	February 12, 1999
NO. 15	NORTH ATLANTIC	February 12, 1999
NO. 16	PRIVATE CITIZEN - RICHARD BERGER	February 18, 1999

ATTACHMENT 2
Y2K REMEDIATION STATUS
OF NPP AND GDP TELCOS (as of April 14, 1999)

ID	Plant Name	Carrier	Switch Type	Switch Manufacturer	Y2K Status
1	Arkansas	Contel of Arkansas, Inc. DBA GTE Arkansas	DMS 100/200 (Digital) Host	Nortel	Done
2	Babcock & Wilcox (BWX)	Bell Atlantic - Virginia, Inc.	5ESS (Digital)(Local)/(Toll)	Lucent	Done
3	Beaver Valley	Bell Atlantic - Pennsylvania, Inc.	DMS 100 (Digital) Host	Nortel	Done
4	Bellefonte	GTE South, Inc. - Alabama	GTD5 (Digital)	AGCS	Done
5	Big Rock	Ameritech Michigan	Remote Switching Center	Nortel	Done
6	Braidwood	Ameritech Illinois	Remote Switching Center	Nortel	Done
7	Browns Ferry	South Central Bell	5ESS Remote (5B RSM)	Lucent	Done
8	Brunswick	Southern Bell Telephone Co.	Remote Switching Center	Nortel	2Q99 4/23/99
9	Byron	GTE of Illinois	GTD5 (Digital)	AGCS	Done
10	Callaway	Kingdom Telephone Co.	DMS (Digital)	Nortel	Done
11	Calvert Cliffs	Bell Atlantic - Maryland, Inc.	5ESS Remote (5A RSM)	Lucent	Done
12	Catawba	Southern Bell Telephone Co.	5ESS Remote (5A RSM)	Lucent	Done
13	Clinton	GTE of Illinois	GTD5 (Digital)	AGCS	Done
14	Comanche Peak	GTE Southwest, Inc. - Texas	DMS (Digital)	Nortel	Done
15	Cooper Station	Aliant Communication	GTD5 (Digital)	AGCS	3Q99
16	Crystal River	Sprint - Florida, Inc. DBA United Telephone of Florida	DSS (Digital)	North Electric	Done
17	Davis Besse	Ameritech Ohio	5ESS (Digital)(Local)/(Toll)	Lucent	Done
18	DC Cook	Contel of the South DBA GTE So. - Michigan	5ESS Host (Digital)	Lucent	2Q99
19	Diablo Canyon	Pacific Bell	5ESS (Digital)(Local)/(Toll)	Lucent	2Q99 6/30/99
20	Dresden	Ameritech Illinois	5ESS (Digital)(Local)/(Toll)	Lucent	Done
21	Duane Arnold	Palo Co-Op Phone Association	DMS (Digital)	Nortel	Done
22	Farley	Graceba Total Communications	DCO	Siemens	2Q99

ATTACHMENT 2 Y2K REMEDIATION STATUS OF NPP AND GDP TELCOS (as of April 14, 1999)					
ID	**Plant Name**	**Carrier**	**Switch Type**	**Switch Manufacturer**	**Y2K Status**
23	Fermi	Century Telephone of Michigan, Inc.	DMS 100 (Digital) Host	Nortel	Done
24	Fitzpatrick	Bell Atlantic New York	DMS (Digital)	Nortel	2Q99
25	Fort Calhoun	Blair Telephone Company	DMS (Digital)	Nortel	Done
26	Ginna	Bell Atlantic New York	5ESS Remote (5A RSM)	Lucent	Done
27	Grand Gulf	South Central Bell	DCO (Digital)/Century System (Toll)	Siemens	Done
28	Harris	Southern Bell Telephone Co.	DMS 100 (Digital) Host	Nortel	Done
29	Hatch	Southern Bell Telephone Co.	5ESS (Digital)(Local)/(Toll)	Lucent	Done
30	Hope Creek	Bell Atlantic - New Jersey, Inc.	DMS 100 (Digital) Host	Nortel	1Q99
31	Indian Point	Bell Atlantic New York	5ESS Remote (5A RSM)	Lucent	1Q99
32	Kewaunee	Ameritech Wisconsin	5ESS Remote (5A RSM)	Lucent	Done
33	La Salle	Ameritech Illinois	5ESS Remote (5A RSM)	Lucent	Done
34	Limerick	Bell Atlantic - Pennsylvania, Inc	5ESS Host (Digital)	Lucent	Done
35	McGuire	Southern Bell Telephone Co.	5ESS (Digital)(Local)/(Toll)	Lucent	Done
36	Millstone	Southern New England Telephone Co.	No. 1A ESS (Local)/(Toll)	Lucent	Done
37	Monticello	Tds Telecom	DMS 100/200 (Digital) Host	Nortel	Done
38	Nine Mile Point	Bell Atlantic New York	DMS (Digital)	Nortel	2Q99
39	North Anna	Bell Atlantic - Virginia, Inc.	5ESS Remote (5A RSM)	Lucent	Done
40	Oconee	Southern Bell Telephone Co.	5ESS Host (Digital)	Lucent	Done
41	Oyster Creek	Bell Atlantic - New Jersey, Inc.	DMS 100 (Digital) Host	Nortel	Done
42	Paducah	South Central Bell	DMS 100 (Digital) Host	Nortel	2Q99 5/15/99
43	Palisades	GTE of Michigan	GTD5-EAX (Digital) Remote	AGCS	2Q99
44	Palo Verde	US West Communications - Mountain Bell	Remote Switching Center	Nortel	Done

ATTACHMENT 2 Y2K REMEDIATION STATUS OF NPP AND GDP TELCOS (as of April 14, 1999)					
ID	**Plant Name**	**Carrier**	**Switch Type**	**Switch Manufacturer**	**Y2K Status**
45	Peach Bottom	GTE of Pennsylvania	GTD5-EAX (Digital) Remote	AGCS	Done
46	Perry	Alltel Western Reserve Phone	5ESS Remote (5A RSM)	Lucent	Done
47	Pilgrim	Bell Atlantic NE	5ESS Host (Digital)	Lucent	Done
48	Point Beach	GTE of Wisconsin	GTD5-EAX (Digital) Remote	AGCS	Done
49	Portsmouth	GTE North, Inc. - Ohio	GTD5 (Digital)	AGCS	Done
50	Prairie Island	US West Communications - Northwestern Bell	DMS 100 (Digital) Host	Nortel	Done
51	Quad Cities	GTE North, Inc. - Illinois	Remote Switching Center	Nortel	1Q99
52	River Bend	South Central Bell	Remote Switching Center	Nortel	Done
53	Robinson	Southern Bell Telephone Co.	5ESS (Digital)(Local)/(Toll)	Lucent	Done
54	Salem	Bell Atlantic - New Jersey, Inc.	DMS 100 (Digital) Host	Nortel	1Q99
55	San Onofre	Pacific Bell	DMS 100 (Digital) Host	Nortel	Done
56	Seabrook	Bell Atlantic NE	DMS (Digital)	Nortel	Done
57	Sequoyah	South Central Bell	5ESS (Digital)(Local)/(Toll)	Lucent	Done
58	South Texas	GTE Southwest, Inc. - Texas	GTD5 (Digital)	AGCS	Done
59	St. Lucie	Southern Bell Telephone Co.	No. 1A ESS (Local)/(Toll)	Lucent	Done
60	Summer	Southern Bell Telephone Co.	5ESS Remote (5A RSM)	Lucent	Done
61	Surry	GTE South, Inc. - Virginia	Remote Switching Center	Nortel	Done
62	Susquehanna	Commonwealth Telephone Enterprises, Inc.	Remote Switching Center	Nortel	1Q99
63	Three Mile Island	Bell Atlantic - Pennsylvania, Inc	DMS 100 (Digital) Host	Nortel	Done
64	Turkey Point	Southern Bell Telephone Co.	5ESS (Digital)(Local)/(Toll)	Lucent	Done
65	Vermont Yankee	Bell Atlantic NE	5ESS Host (Digital)	Lucent	Done
66	Vogtle	Southern Bell Telephone Co.	DMS 100 (Digital) Host	Nortel	Done
67	Waterford	South Central Bell	DCO (Digital)/Century System (Toll)	Siemens	Done

ATTACHMENT 2 Y2K REMEDIATION STATUS OF NPP AND GDP TELCOS (as of April 14, 1999)					
ID	**Plant Name**	**Carrier**	**Switch Type**	**Switch Manufacturer**	**Y2K Status**
68	Watts Bar	South Central Bell	AT&T Technologies Optically Remote Switching Module	AT&T	Done
69	WNP	United Telephone - Northwest	Remote Switching Center	Nortel	1Q99
70	Wolf Creek	Spring/United Telephone Company of Kansas	5ESS Host (Digital)	Lucent	Done

ATTACHMENT 3
TIMELINE FOR OPERATIONS CENTER STAFFING
FOR STANDBY MODE

Day	Time (EST)	Response Level
12/31/99	1200	A subset of the Y2K Response Team (communicators, reactor experts, electrical/I&C experts, and other NRC representatives) will assemble in the Operations Center to monitor Y2K reports from NEA and other foreign regulatory bodies. Any reported Y2K-related plant system problems, grid problems, or widespread telecommunication outages will be evaluated for relevancy and communicated to our licensees. In addition, this group would assess any problems created by a Y2K failure associated with an embedded chip that is date stamped in earlier time zone (e.g., UTC).
12/31/99	2200	Agency enters Standby response mode. Operations Center is staffed with the full Y2K response team.
01/01/00	0000	Y2K transition begins.
01/01/00	0015	Operations Center communicators conduct "phone checks" of all NPPs in EST zone. Any Y2K problems are reported to licensees via YEWS.
01/01/00	0115	Operations Center communicators conduct "phone checks" of all NPPs in CST zone. Any Y2K problems are reported to licensees via YEWS.
01/01/00	0215	Operations Center communicators conduct "phone checks" of all NPPs in MST zone. Any Y2K problems are reported to licensees via YEWS.
01/01/00	0315	Operations Center communicators conduct "phone checks" of all NPPs in PST zone. Any Y2K problems are reported to licensees via YEWS.
01/01/00	0600	The Executive Team member would decide when the response organization could stand down from Standby or if events warrant escalating the NRC response to Initial Activation.

ATTACHMENT 4
Y2K STAFFING PLAN

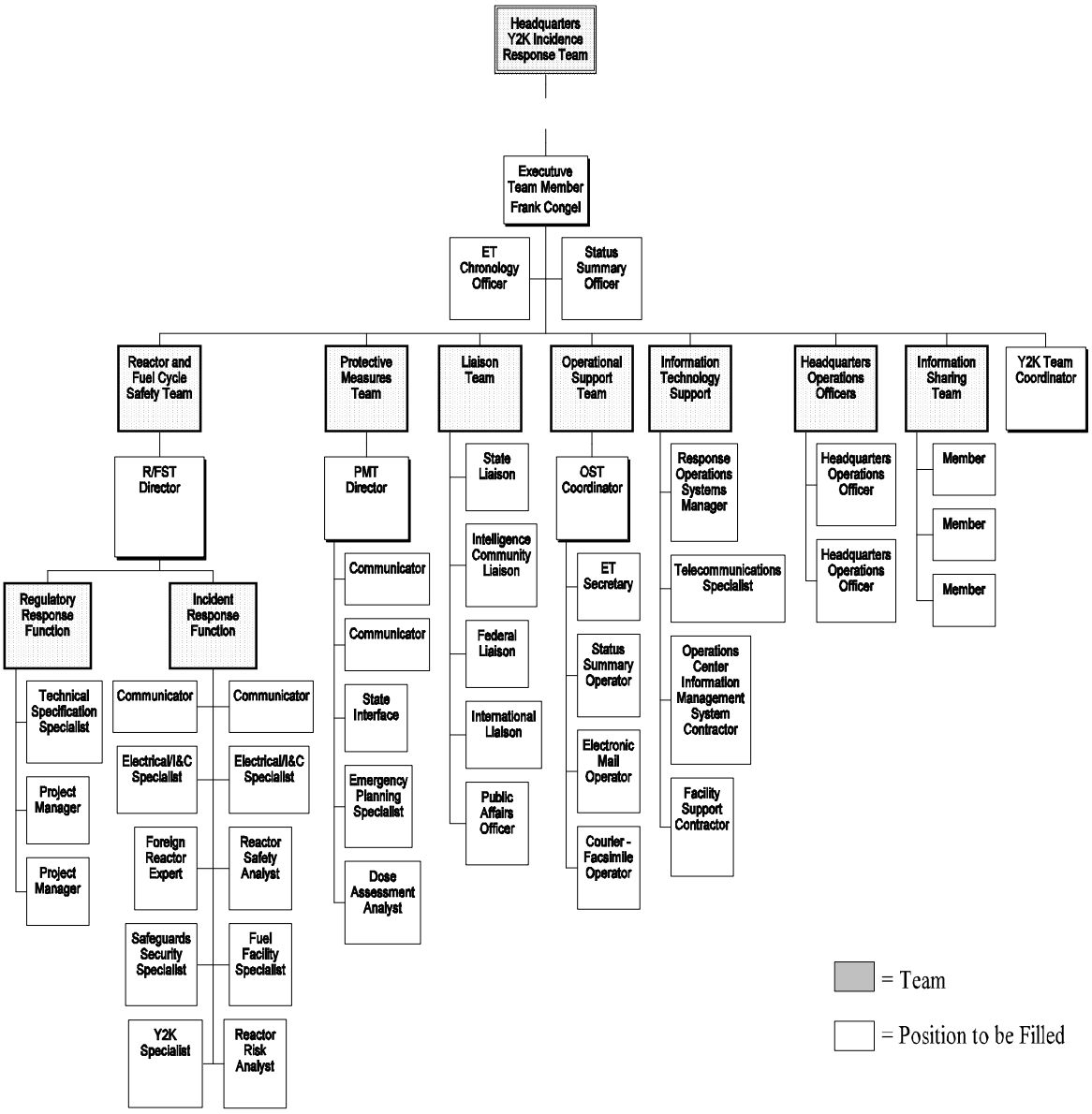
HEADQUARTERS STAFFING

As shown in the following staffing chart, the Headquarters multi-disciplinary team of responders would be headed by an Executive Team Member, the director of Incident Response Operations (IRO). The ET member would be supported by a chronology officer and a status summary officer--since Headquarters plans to issue several status summaries during the Y2K staffing period. In the event that a Y2K problem involving an NRC licensee requires an NRC response, the Reactor and Fuel Cycle Safety Team (R/FST), the Protective Measures Team (PMT), the Liaison Team (LT), the Headquarters Operations Officers (HOOs), and the Operational Support Team (OST) will fulfill their roles as they would for any NRC response. The Director of the R/FST would also have the added responsibility of providing direction to the Regulatory Response Team. It is envisioned that the Director R/FST position will be filled by a NRR manager who is currently a Director or Deputy Director on the Reactor Safety Team.

The Information Technology Support Team would be responsible for ensuring that Operations Center information systems and support systems function as expected during the Y2K transition. This team will include the Office of Administration facility support staff and contractors to ensure that emergency power and environmental control systems remain operable through the Y2K transition. This team would also be responsible for the logistics associated with operation of the portable satellite equipment. The Information Sharing Team would consist primarily of representatives from the Office of International Programs. However, in carrying out the information sharing aspect of the contingency plan, they will receive support from specialists on the R/FST Incident Response Team and from the communicators on R/FST and PMT. The Y2K Team Coordinator would support the ET member in ensuring that the various aspects of the Contingency Plan (Incident Response, Information Sharing, and Regulatory Response) are coordinated and implemented in an effective manner.

The advance team that staffs the Operations Center at 1200 on December 31, will be a relatively small subset of the full Y2K Response Team.

NRC Headquarters Y2K Response Team



REGION SUPPORT AND BACKUP

Starting on December 31, all four regions will staff their IRCs with a small number of people to support headquarters with the regulatory response role (enforcement discretion review), to serve as liaison with FEMA and States, and to initiate the call-out of response personnel, if needed. Regions will retain the option to increase or reduce staffing as deemed necessary. Each region will respond to events using routine response procedures and will provide for a replacement shift to provide 24 hour operation, if needed.

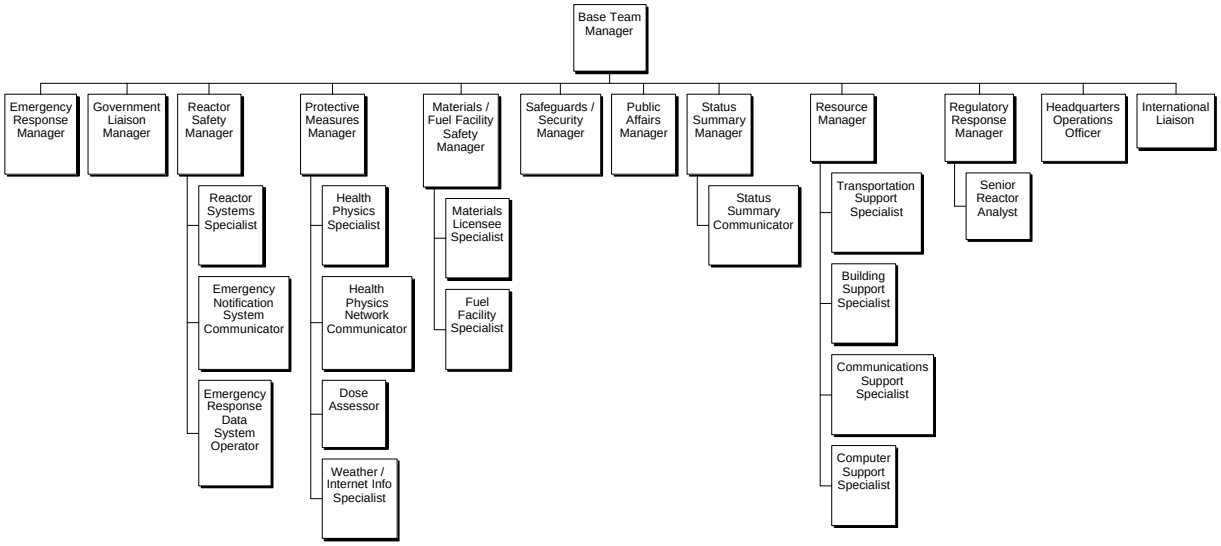
In addition to the staffing for regulatory response, Region IV will have the capability to rapidly augment staffing in the Region IV IRC with personnel to meet the following objectives:

- Assist headquarters in an "overflow" capacity

- Act in the role of NRC Headquarters in the event of a loss of ability to respond from the headquarters Operations Center

The augmented Region IV response staffing will resemble the organization chart below:

Region IV Backup Y2K Response Team



While the organization may show 28 positions, some economy will be achieved depending on the skills of individuals who are selected. Some positions (such as those under the Resource Manager) may be consolidated to only require two people instead of four. Additional support / personnel may be needed for regulatory response and information brokering roles. Plans are being made to accommodate up to 30 people for Y2K response and support in Region IV. A second shift roster will be prepared to ensure availability of personnel to fill these positions on an ongoing, 24-hour basis, if needed.

Each region will arrange for one resident inspector (or other qualified individual) to be available to respond promptly to the assigned operating NPP and GDP site beginning at 5:00 p.m. EST (00:00 UTC) on December 31. The assigned responder will be onsite not later than 10:00 p.m. local time and will be expected to be in (one of) the control room(s) from about 11:00 p.m. until about 1:00 a.m. local time, monitoring ongoing operations and conditions. [7] After 1:00 a.m., if conditions are normal, the assigned inspector may return to the NRC office, remaining available to respond, if necessary.

Each site will have a satellite telephone for contingency use if other telecommunications lines are not available. The Regions and Headquarters will also have appropriate satellite communications capability. The satellite phone will be tested on December 31, before 11:00 p.m. to verify operability.

Between 12:15 a.m. and 1:00 a.m. on January 1, the assigned inspector will provide a status report to NRC management. The report will contain current plant status, preliminary details of any abnormalities which have been experienced, and information about contingency plans the licensee had to implement. These reports will be made to the regional IRC. Once all sites for a region have called in, the Regional IRC will forward a summary of information to the headquarters Operations Center. If there are communications problems affecting a regions IRC, the assigned inspector will call the headquarters Operations Center. If the headquarters Operations Center cannot be contacted, then the Region IV IRC will be notified. Phone numbers for these contacts will be distributed to each site prior to December 31.

If necessary, another inspector will be dispatched to relieve the on-duty inspector.

[7] At each GDP, there is one Operations Center, multiple control rooms for different processes, and multiple control areas in the buildings. Consequently, the GDP resident inspector (or other qualified individual) will be in an appropriate safety-significant location of the facility at the transition time.

ATTACHMENT 5
NRC Y2K EXERCISE SCHEDULE

Date	Exercise / Activity
May 19-20	Federal Response Plan Community Tabletop Exercise
May - August	FEMA Y2K REP Seminars
July 14 (tentative)	NRC Y2K Tabletop
September 9	NERC Exercise (NRC involvement not currently planned)
September 18 and 25	National Y2K Tabletop
October 15 (tentative)	Y2K Response Team Full Scale Exercise
December 31-January 1	Headquarters Operations Center, Regional Incident Response Centers and sites staffed by Y2K Response Team