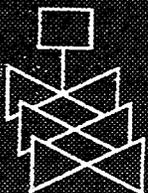
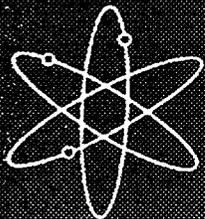
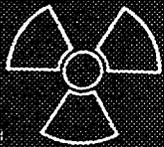


# Year 2000 Readiness in U.S. Nuclear Power Plants



U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
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# **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 remaining Y2K 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

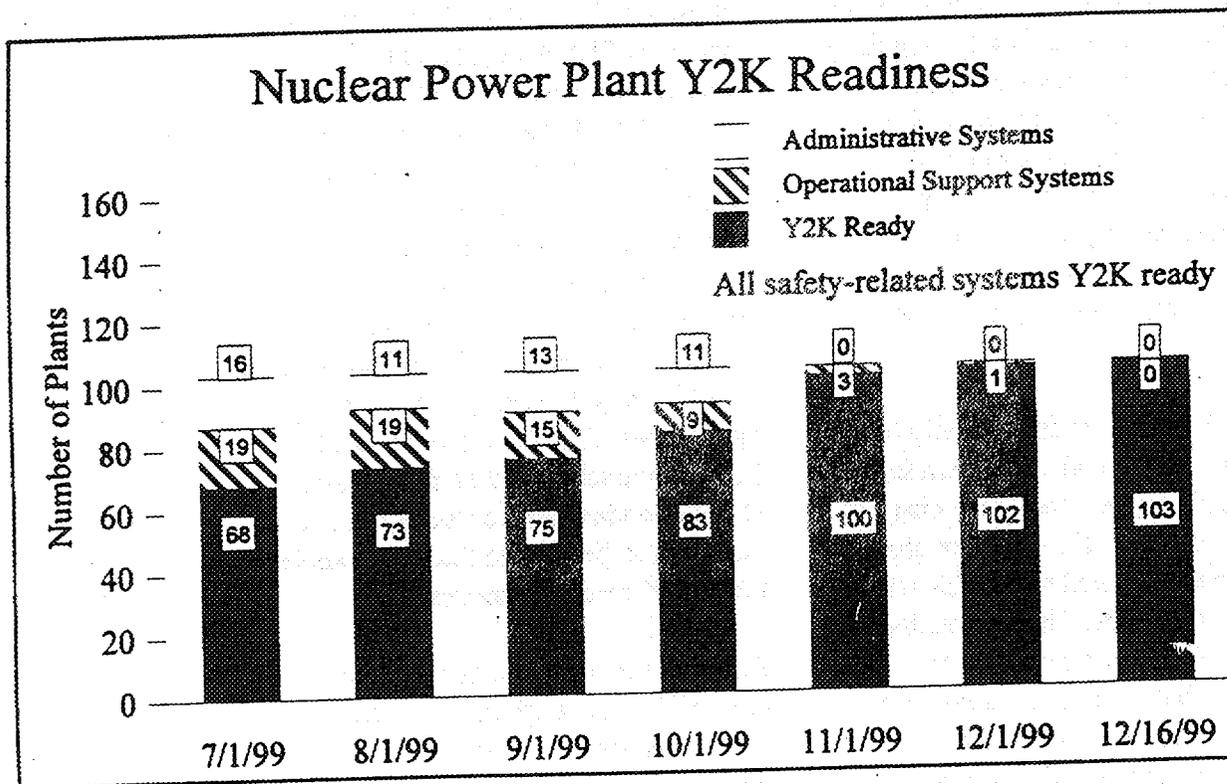
these components involved systems needed to safely shut down the plant. The licensee is performing additional audits of its NPP Y2K inventory, and is developing a plan of action, which the NRC will monitor.

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.



## ACKNOWLEDGMENTS

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

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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 I 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.

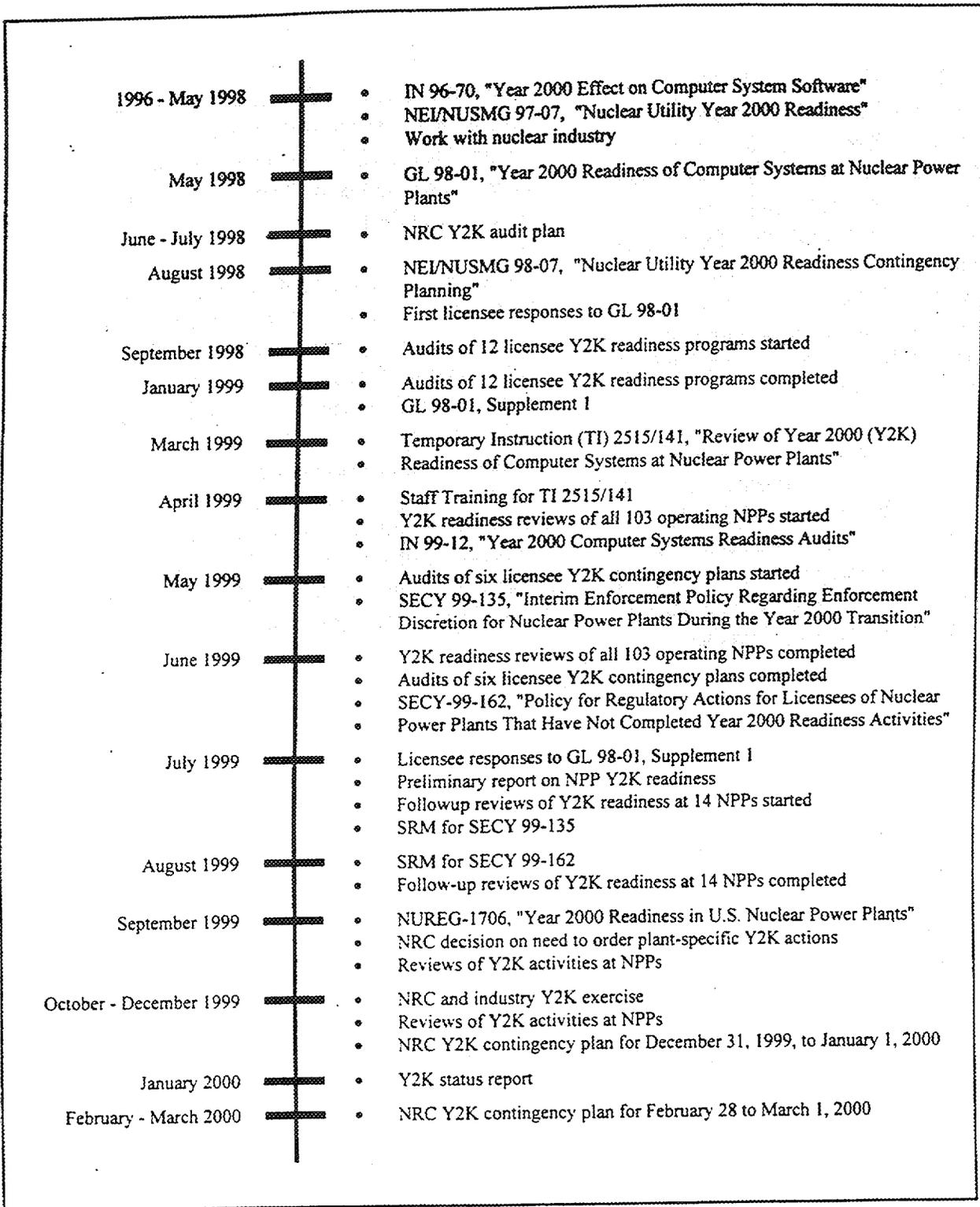


Figure 1. NRC Activities Related to NPP Y2K Readiness

### 3 REVIEW AND INTEGRATION APPROACH

This section describes the methodology used by the NRC staff to conduct Y2K reviews at each of the 103 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.

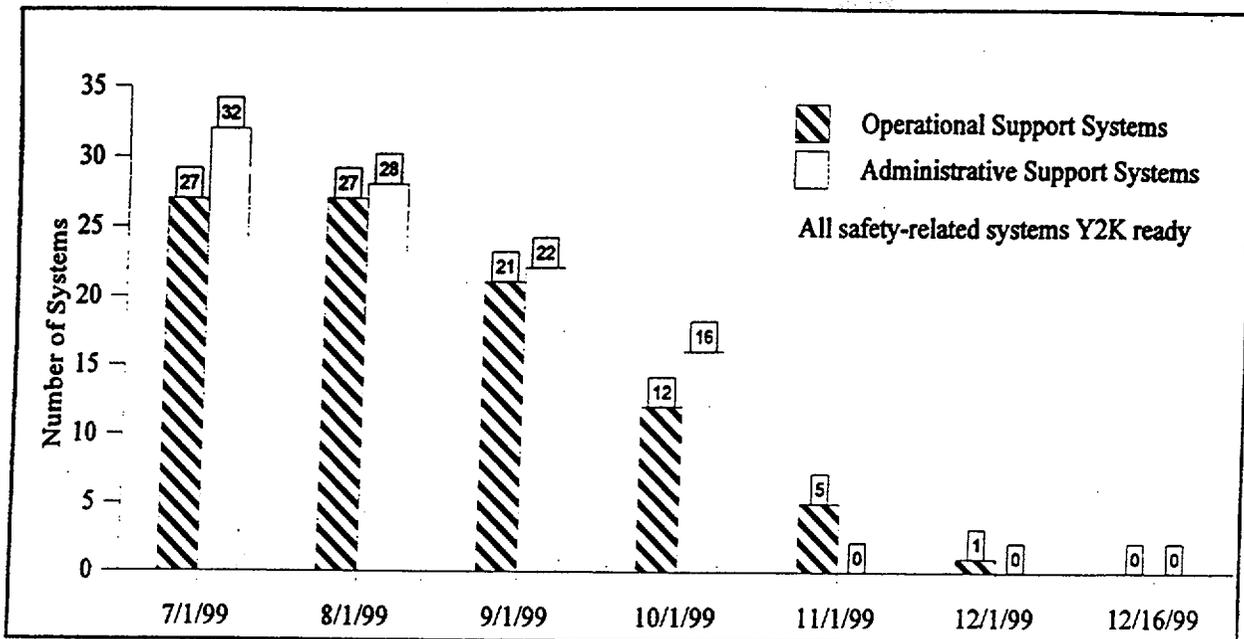


Figure 2. Systems and Components Remaining to be Remediated

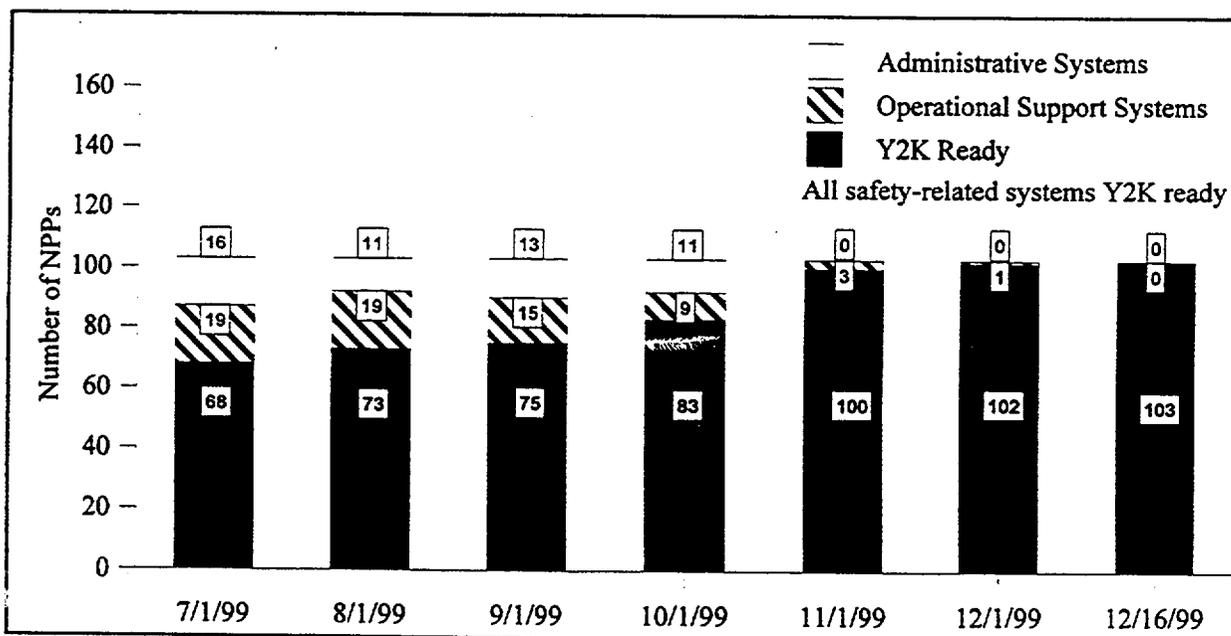


Figure 3. Status of NPP Y2K Readiness



## 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 the Y2K 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**

<b>NPP Name</b>	<b>NPP Licensee</b>	<b>Readiness Status/Date*</b>
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
Bra dwood 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

\* 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*
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

\* All safety-related systems are Y2K ready

**Table 1 NPP Y2K Readiness Status  
as of September 1, 1999 (continued)**

<b>NPP Name</b>	<b>NPP Licensee</b>	<b>Readiness Status/Date*</b>
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
Salern Nuclear Generating Station, Unit 1	Public Service Electric and Gas Co. of New Jersey	11/6/99
Salern 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	<p><u>Atmospheric Radioactive Effluent Release Assessment System (ARERAS)</u>. 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.</p>	Operations	9/30/99
	<p><u>Emergency Response Data System (ERDS)</u>. 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.</p>	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	<u>Plant Monitoring and Trending Computer (IPC)</u> . 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	<u>Emergency Response Facility Monitoring and Trending Computer (ERFCS)</u> . 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	<u>Health Physics Information Management System</u> . 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

<b>Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)</b>			
<b>NPP</b>	<b>NPP System and Completion Activities</b>	<b>NPP System Type</b>	<b>Completion Date*</b>
Browns Ferry Nuclear Power Station, Units 2 and 3 (cont)	<u>Security Check-In Process Software</u> . 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
	<u>Nuclear Operations Management System</u> . 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	<u>3D Monicore</u> . 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	<u>Unit 1 Condensate Polishing Programmable Logic Controller System</u> . 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	<u>Common Facility - Plant Simulator</u> . 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	<u>Integrated Contingency Planning</u> . 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	<u>Main Annunciator System (MAS)</u> . 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	<u>Meteorological Information and Dispersion Assessment System (MIDAS)</u> . 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	<p><u>Plant Training Simulator</u>. 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.</p>	Admin.	10/29/99
	<p><u>Emergency Response Data System (ERDS)</u>. 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.</p>	Admin.	9/30/99
Joseph M. Farley Nuclear Plant, Unit 2	<p><u>Unit 2 Turbine Digital Electrohydraulic Controller</u>. 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.</p>	Operations	12/16/99

\* All safety-related systems are Y2K ready

<b>Table 2 NPP Systems and Components Requiring Completion of Year 2000 Readiness Activities as of September 1, 1999 (continued)</b>			
<b>NPP</b>	<b>NPP System and Completion Activities</b>	<b>NPP System Type</b>	<b>Completion Date*</b>
Limerick Generating Station, Unit 2	<u>Plant Monitoring System and 3D Monicore</u> . 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	<u>High Capacity Steam Generator (SG) Blowdown Radiation Monitor</u> . 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
	<u>High Capacity Steam Generator Blowdown Distributed Control System (SGBCS)</u> . 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	<u>REM/AACS/CISCO</u> . 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	<u>3D Monicore</u> . 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	<u>Digital Feedwater System</u> . 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
	<u>Turbine Vibration Monitor</u> . 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)	<u>3D Monicore</u> . 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	<u>Advanced Digital Feedwater System</u> . 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
	<u>Overhead Annunciators</u> . 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)	<p><u>Plant Computer Monitoring and Alarm System</u>. 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.</p>	Operations	11/6/99
Salem Nuclear Generating Station, Units 1 and 2	<p><u>Plant Training Simulator</u>. 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.</p> <p><u>Emergency Response Data System (ERDS)</u>. 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.</p>	Admin.  Admin.	10/29/99  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	<u>Health Physics Information Management System.</u> 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
	<u>Security Check-In Process Software.</u> 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
	<u>Nuclear Operations Management System.</u> This administrative computer 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

**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	<u>Plant Integrated Computer System (ICS)</u> . 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	<u>Digital Turbine Control System</u> . 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
	<u>REM/AACS/CISCO</u> . 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	<p><u>Refueling Platform</u> - 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.</p>	Admin.	9/30/99
Watts Bar Nuclear Plant, Unit 1	<p><u>Health Physics Information Management System</u>. 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.</p>	Admin.	10/31/99
	<p><u>Nuclear Operations Management System</u>. 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.</p>	Admin.	10/31/99

\* All safety-related systems are Y2K ready

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This report describes the results of NRC staff reviews of licensee nuclear power plant (NPP) year 2000 (Y2K) readiness activities conducted at each nuclear power plant. The results of the staff reviews are integrated 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 follow-up reports of 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 which affect the performance of safety systems needed to safely shut down the plants. As of September 1, 1999, the staff concludes 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 for 28 plants have additional work to complete on a few non-safety systems or components that support plant operations and administrative functions. These licensees provided scheduled completion dates for their plants. Typically, the licensee is completing the remaining Y2K 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 licensees are expected to be Y2K ready by December 16, 1999.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

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No. 99-207

FOR IMMEDIATE RELEASE  
(Tuesday, September 28, 1999)

## ***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:

<b>Plant Name</b>	<b>Nearest City</b>	<b>Y2K Ready Date</b>
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.

#

**\* REISSUED COPY \***

Due to a formatting error, this letter is being reissued in its entirety. Please discard the earlier version of this document and replace it with this one.

DISTRIBUTION FOR GT # 19990490 DATED: October 20, 1999

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