

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001



October 14, 2003

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 505th MEETING OF THE ADVISORY COMMITTEE
ON REACTOR SAFEGUARDS, SEPTEMBER 10-13, 2003, AND OTHER
RELATED ACTIVITIES OF THE COMMITTEE

During its 505th meeting, September 10-13, 2003, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letter, and memoranda:

REPORTS:

Reports to Nils J. Diaz, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS; Subject:

- Report on the Safety Aspects of the License Renewal Application for the St. Lucie Nuclear Plant, Units 1 and 2, dated September 17, 2003
- Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single-Failure Criterion to Safety Systems," dated September 22, 2003
- Draft Final Regulatory Guide x.xxx, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (formerly DG-1122), dated September 22, 2003
- Draft Final Review Standard for Extended Power Uprates, RS-001, dated September 24, 2003
- Draft Final Revision 3 to Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," dated September 30, 2003

LETTER:

Letter to William D. Travers, Executive Director for Operations, NRC, from Mario V. Bonaca, Chairman, ACRS, Subject: Proposed Recommendations for Resolving Generic Issue 186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants," dated September 24, 2003

The Honorable Nils J. Diaz

MEMORANDA:

Memoranda to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS; Subject:

- Draft Final Revision 1 of Regulatory Guide 1.138, "Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants" (Draft was issued as DG-1109), dated September 15, 2003
- Draft Final Regulatory Guide DG-1099, "Anchoring Components and Structural Supports in Concrete," dated September 15, 2003

HIGHLIGHTS OF KEY ISSUES

1. Safeguards and Security Matters

The Committee met with representatives of the NRC staff, the Nuclear Energy Institute (NEI), and their contractors to discuss safeguards and security matters, including Commission papers on risk-informed guidance for vulnerability assessment and on risk-informed decisionmaking, integration of the results of the vulnerability studies, potential vulnerability to sabotage of spent fuel storage facilities, and NEI-sponsored work in the area of safeguards and security. This meeting was closed pursuant to 5 U.S.C. 552b(c)(1).

Committee Action

The Committee plans to issue reports on selected topics in the near future.

2. Final Review of the St. Lucie License Renewal Application

The Committee heard presentations by and held discussions with representatives of the NRC staff and Florida Power and Light Company regarding the staff's final Safety Evaluation Report (SER) for the St. Lucie Nuclear Plant, Units 1 and 2 License Renewal Application. The staff discussed the resolution of open and confirmatory items that were included in the initial SER. The applicant stated that it plans to implement 70 to 80% of the commitments for license renewal prior to the issuance of the renewed licenses.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 17, 2003. The Committee recommended that the application for renewing the operating licenses for St. Lucie, Units 1 and 2 be approved.

The Honorable Nils J. Diaz

3. Draft Final Regulatory Guide x.xxx, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities"

The Committee met with representatives of the NRC staff to discuss the draft final Regulatory Guide x.xxx on an approach for determining the technical adequacy of probabilistic risk assessment (PRA) results for risk-informed activities (formerly DG-1122). The Regulatory Guide conditionally endorses the American Society of Mechanical Engineers standard for PRA and is an important step for the increased use of PRA technology in regulatory decisionmaking.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 22, 2003. The Committee recommended that the draft final Regulatory Guide be issued for trial use with an appropriate sample of pilot plants. The Committee looks forward to reviewing guidance being developed by the NRC staff on how to perform sensitivity and uncertainty analyses in early 2004.

4. Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding proposed recommendations for resolving Generic Issue-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants."

The staff stated that NUREG-1774, "Survey of Crane Operating Experience at U.S. Nuclear Power Plants from 1968 through 2002," notes that human error and rigging deficiencies below the hook account for many of the observed load drop events. The report concludes that licensees could have reduced the frequency of crane operating events attributable to human error if they had focused appropriate attention on the crane operating practices described in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The staff discussed its proposed recommendations to reduce the number and potential severity of load drop events.

Committee's Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated September 24, 2003, agreeing with the staff's position that regulatory action is needed to reduce the number and potential severity of heavy load drop events.

5. Draft Final Review Standard for Reviewing Core Power Uprate Applications

The staff presented the draft final version of Review Standard RS-001, "Review Standard for Extended Power Uprates," which reflects incorporation of public comments, as appropriate. The purpose of developing the Review Standard included (1) standardization of the staff review

The Honorable Nils J. Diaz

process, (2) predictability of the process and its results, and (3) retention of corporate memory. The standard will be a living document, and the staff will be encouraged to re-assess the guidance and update them to reflect new information that arises. During the review of the proposed version of this Standard, the Committee raised seven concerns and the staff has satisfactorily addressed those concerns in the draft final version of the Review Standard.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 24, 2003, recommending that the Review Standard be released for use in the review of future applications for extended power uprates.

6. Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA"

The Committee heard presentations by and held discussions with representations of the NRC staff regarding the draft final Revision 3 to Regulatory Guide (RG) 1.82, which is part of the staff's resolution of GSI-191, PWR Sump Blockage. The staff discussed the RG with the Committee in February 2003, and had subsequently issued it for public comment. The version that was presented to the Committee on September 11, 2003 included staff consideration of the public comments.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 24, 2003, recommending that Revision 3 to RG 1.82 be issued. The Committee stated that additional technical work remains to be performed (1) to develop a technical basis to resolve issues related to chemical reactions inside the containment, (2) to develop an acceptable method that can be used directly as guidance for the analysis of sump blockage. In addition, the Committee recommended that alternative solutions be investigated to ensure long-term core cooling. The Committee also stated that the staff should investigate a risk-informed approach to sump screen blockage.

7. Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems"

The Committee met with representatives of the NRC staff and the Institute of Electrical and Electronics Engineers, Inc. (IEEE) to discuss the draft final Revision 1 to Regulatory Guide 1.53, which endorses IEEE Std 379-2000, "IEEE Standard Application of the Single-Failure Criterion to Nuclear Power Generating Station Safety Systems." This is the first update to Regulatory Guide 1.53 since it was issued in June 1973. The staff stated that IEEE Std 379-2000 provides methods acceptable to the NRC staff for satisfying the NRC's regulations with respect to the application of the single failure criterion to the electrical power, instrumentation, and control portions of nuclear power plant safety systems.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated September 22, 2003. The Committee recommended that Revision 1 to Regulatory Guide 1.53 be issued.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the response from the EDO dated August 4, 2003, to the ACRS report dated May 16, 2003, concerning Improvement of the Quality of Risk Information for Regulatory Decisionmaking. The Committee decided that it was satisfied with the EDO's response.

In its response, the EDO stated that the ASME Standard needs additional guidance in interpreting and applying some of the supporting level requirements. The peer-review team intends to provide this feedback to ASME. The staff also intends to add this guidance, where appropriate, in DG-1122. The staff plans to meet with the Committee as the above guidance is developed.

- The Committee considered the response from the EDO dated August 8, 2003, to the ACRS report dated June 24, 2003, concerning Update to License Renewal Guidance Documents. The Committee decided that it was satisfied with the EDO's response.

The Committee would like to review the results of the RES study and NRR decision on setting a limit on phosphate ion concentration

- The Committee considered the response from the EDO dated August 11, 2003, to the ACRS report dated May 16, 2003, concerning the Vessel Head Penetration Cracking and Reactor Pressure Vessel Degradation. The Committee decided that it was satisfied with the EDO's response and would further like to review the following:

— the new models, improvements to the inspection requirements, and other related revisions to regulatory requirements that are stated to be developed by the staff when the root cause of the South Texas Project cracking is known.

— the results of RES studies on low-alloy steels exposed to boric acid solutions as well as the models based on those studies.

— the RES work to address the capability and reliability of VHP inspection techniques.

— the RES longer-term program to explore other types of degradation and other sites that could be susceptible to PWSCC in Alloy 600 as well as the broad-based research plan.

The Honorable Nils J. Diaz

— the integrated analysis method developed by RES to support evaluations of inspection techniques and intervals for long-term management of VHP degradation and incorporation in risk assessments.

- The Committee considered the response from the EDO dated August 21, 2003, to the ACRS report dated July 16, 2003, concerning Safety Culture. The Committee decided that it was satisfied with the EDO's response.

The Committee would like to be briefed on further developments of agency activities in the safety culture area.

LIST OF OTHER MATTERS FOR THE ATTENTION OF THE EDO

- The Committee would like to review the proposed resolution of Generic Issue 186, "Potential Risk Consequences of Heavy Load Drops in Nuclear Power Plants."
- The Committee plans to review the draft Regulatory Guide being developed by the staff to provide guidance on performing sensitivity and uncertainty analyses. The staff told the Committee that this Guide may be available for ACRS review in early 2004.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from July 9, 2003, through September 9, 2003, the following Subcommittee meetings were held:

- Thermal-Hydraulic Phenomena - July 16-17, 2003

The Subcommittee reviewed the thermal-hydraulic aspects of the AP1000 design with representatives of the NRC staff and Westinghouse Electric Company, LLC.

- Future Plant Designs - July 17-18, 2003

The Subcommittee discussed the Westinghouse AP1000 Instrumentation and Control design concept, man-machine interface design acceptance criteria, human factors issues, and the status of resolution of open items regarding the design review.

- Thermal Hydraulic Phenomena - August 19 and 20, 2003

The Subcommittee discussed the "Review Standard for Extended Power Upgrades," and reviewed the staff's resolution of public comments associated with the Draft Regulatory Guide DG-1107, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident."

The Honorable Nils J. Diaz

- Planning and Procedures - September 9, 2003

The Subcommittee discussed proposed ACRS activities, practices, and procedures for conducting Committee business and organizational and personnel matters relating to ACRS and its staff.

- Fire Protection - September 9, 2003

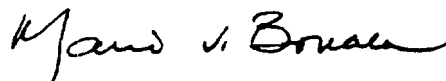
The Subcommittee discussed the status of the revision to 10 CFR 50.48 to endorse NFPA-805 Standard, proposed rulemaking plan on manual actions, and other fire protection matters.

PROPOSED SCHEDULE FOR THE 506th ACRS MEETING

The Committee agreed to consider the following topics during the 506th ACRS meeting, held on October 1-3, 2003:

- Meeting with the NRC Commissioners
- Final Review of the Fort Calhoun License Renewal Application
- Interim Review of the AP1000 Design
- Proactive Materials Degradation Assessment Program
- Subcommittee Report on the Interim Review of the License Renewal Application for H. B. Robinson Nuclear Power Plant
- Subcommittee Report on Fire Protection Matters
- Review of the PIRT Process
- Operating Experience Assessment Report - Effects of Grid Events on Nuclear Power Plant Performance
- Draft Final Revision to Regulatory Guide 1.168 (DG-1123), "Verification, Validation, Review, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants"
- Subcommittee Report on Reactor Fuels
- Format, content, and assignments for the ACRS report on the NRC Safety Research Program
- Safeguards and Security

Sincerely,



Mario V. Bonaca
Chairman



Date Issued: 10/28/2003
Date Certified: 11/10/2003

TABLE OF CONTENTS
MINUTES OF THE 505th ACRS MEETING

SEPTEMBER 10-13, 2003

- I. Chairman's Report (Open)
- II. Safeguards and Security Matters (Closed)
- III. Final Review of the St. Lucie License Renewal Application (Open)
- IV. Draft Final Regulatory Guide DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities" (Open)
- V. Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants" (Open)
- VI. Draft Final Review Standard for Reviewing Core Power Uprate Applications (Open)
- VII. Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA" (Open)
- VIII. Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems" (Open)
- IX. Draft Final Regulatory Guide DG-1099, "Anchoring Components and Structural Supports in Concrete" (Open)
- X. Executive Session (Open)
 - A. Reconciliation of ACRS Comments and Recommendations
 - B. Report on the Meeting of the Planning and Procedures Subcommittee Held on September 9, 2003 (Open)
 - C. Future Meeting Agenda

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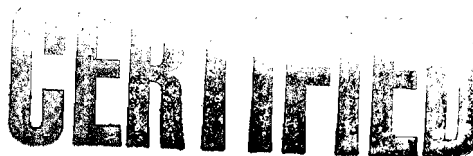
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- Draft Final Regulatory Guide DG-1099, "Anchoring Components and Structural Supports in Concrete," dated September 15, 2003

APPENDICES

- I. *Federal Register Notice*
- II. Meeting Schedule and Outline
- III. Attendees
- IV. Future Agenda and Subcommittee Activities
- V. List of Documents Provided to the Committee



MINUTES OF THE 505th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
SEPTEMBER 10-13, 2003
ROCKVILLE, MARYLAND

The 505th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on September 10-13, 2003. Notice of this meeting was published in the *Federal Register* on August 22, 2003 (65 FR 50811) (Appendix I). The purpose of this meeting was to discuss and take appropriate action on the items listed in the meeting schedule and outline (Appendix II). The meeting was open to public attendance. There were no written statements or requests for time to make oral statements from members of the public regarding the meeting.

A transcript of selected portions of the meeting is available in the NRC's Public Document Room at One White Flint North, Room 1F-19, 11555 Rockville Pike, Rockville, Maryland. Copies of the transcript are available for purchase from Neal R. Gross and Co., Inc. 1323 Rhode Island Avenue, NW, Washington, DC 20005. Transcripts are also available at no cost to download from, or review on, the Internet at <http://www.nrc.gov/ACRS/ACNW>.

ATTENDEES

ACRS Members: ACRS Members: Dr. Mario V. Bonaca (Chairman), Dr. Graham B. Wallis (Vice Chairman), and Mr. Stephen L. Rosen, (Member-at-Large), Dr. George E. Apostolakis, Dr. Thomas S. Kress, Mr. Graham M. Leitch, Dr. Dana A. Powers, Dr. Victor H. Ransom, Dr. William J. Shack, and Mr. John D. Sieber. Dr. F. Peter Ford did not attend this meeting. For a list of other attendees, see Appendix III.

I. Chairman's Report (Open)

[Note: Dr. John T. Larkins was the Designated Federal Official for this portion of the meeting.]

Dr. Mario V. Bonaca, Committee Chairman, convened the meeting at 8:30 a.m. and reviewed the schedule for the meeting. He summarized the agenda topics for this meeting and discussed the administrative items for consideration by the full Committee.

II. Safeguards and Security Matters (Closed)

[Note: Dr. Richard P. Savio was the Designated Federal Official and Richard K. Major was the cognizant staff engineer for this portion of the meeting.]

The Committee met with representatives of the NRC staff, the Nuclear Energy Institute (NEI), and their contractors to discuss safeguards and security matters, including Commission papers on risk-informed guidance for vulnerability assessment and on risk-informed decisionmaking, integration of the results of the vulnerability studies, potential vulnerability to sabotage spent fuel storage facilities, and NEI-sponsored work in the area of safeguards and security. This meeting was closed pursuant to 5 U.S.C. 552b(c)(1).

Committee Action

The Committee plans to issue reports on selected topics in the near future.

III. Final Review of the St. Lucie License Renewal Application (Open)

[Note: Dr. B.P. Jain was the Designated Federal Official for this portion of the meeting]

Mr. Steve Hale, Project Manager for Florida Power and Light Company, began the applicant's presentation.

Mr. Hale provided a brief description of the aging management program for concrete structures below groundwater and stated that the St. Lucie concrete below groundwater requires aging management due to aggressive groundwater. Mr. Hale identified containment, reactor auxiliary building, intake structure, and ultimate heat sink dam as concrete structures which are exposed to groundwater. He noted that the groundwater is characterized by high concentrations of chlorides (>500 ppm) and sulfates (1500 ppm) that create an aggressive environment for concrete structures. Phosphate levels in the groundwater are very low (0.15 ppm). Mr. Hale stated that aging of concrete below groundwater is addressed by design and systems and structures monitoring program (SSMP). Those elements of SSMP that deal with inspections of accessible and inaccessible concrete structures will be enhanced to include specific provisions consistent with industry standards and inspection guidelines. Mr. Hale stressed that during construction, concrete of sufficient quality was used to inhibit degradation of concrete and protect the embedded reinforcing steel.

Mr. Leitch, ACRS Member, asked the applicant if there are components that are inspected on an opportunistic basis, such as buried pipes and tanks which are exposed to groundwater. Mr. Hale responded that there are no buried tanks and piping that is exposed to groundwater. Opportunistic inspections are part of their SSMP. They visually inspect exposed interior and exterior concrete surfaces for signs of degradations (spalling, cracking, rust staining). Buried

structures are inspected when excavated for any reason. Mr. Hale provided an example of recent opportunistic inspections of buried concrete in Unit 1 which were performed during the steam generator replacement project (1997), and the inspection of spent fuel cask crane foundations performed in 2003. However, Mr. Hale noted that in all cases no degradation in the concrete was observed.

Mr. Hale informed the Committee that inspection of the Unit 2 reactor pressure vessel head penetration (RVHP) has been completed and no evidence of leakage or any indications in the RVHP have been found. He then provided more details of the RVHP inspection. They performed 100 percent bare metal visual examination of reactor vessel head surface and of all 102 RVHPs. A 100 percent ultrasonic examination of 102 RVHPs was also performed. An axial flaw was identified and repaired in two control element drive mechanism.

Mr. Hale stated that the replacement reactor vessel heads for both units have been ordered. The industry will continue to participate in the program for assessing and managing primary water stress corrosion cracking in RVHPs and perform inspections as recommended by this program.

Mr. Hale then discussed St. Lucie's commitment tracking system and stated that they plan to implement 70 to 80 percent of the commitments for license renewal prior to the issuance of the renewed licenses. After the implementation, they will maintain license renewal commitments via configuration control documents (license renewal design basis documents, program basis documents, design drawings, calculations, updated final safety analysis reports, and operations and maintenance procedures), design change control process, and the license renewal training.

Mr. Leitch, ACRS Member, raised a concern regarding procedural compliance and stated that procedures need to be followed rigorously. Mr. Leitch cited an example of a procedural compliance issue with pumping out water from a manhole. Apparently there has been a chronic problem of water getting into the manholes, and there is a procedure to inspect the manhole periodically, but the manholes were not inspected. In response, Mr. Hale stated that this was a problem of inadequate procedure itself and not an issue of the procedure compliance. There are differences in Unit 2 and Unit 1 manhole designs. Manholes in Unit 2 cascade to a sump with a sump pump. The procedure developed for Unit 2 required inspection of sumps with the sump pumps. However, Unit 1 does not have similar features and therefore the inspection procedure for Unit 1 required inspection of all safety-related manholes. The real issue was that all of the manholes were not inspected.

Mr. Noel Dudley and Ms. Tilda Liu, NRR Project Managers for the safety review of the St. Lucie license renewal application, briefed the Committee on the staff's evaluation. Mr. Dudley stated that all of the open and confirmatory items have been resolved and the staff has issued its safety evaluation report on July 7, 2003.

Ms. Liu discussed two issues related to pressurizer surge and spray line nozzle thermal sleeves, and non-segregated phase bus. These issues were identified after the last Subcommittee meeting held on April 9, 2003. The staff's concern came from the aging effect associated with cracking of pressurizer surge and spray nozzle thermal sleeves due to fatigue and primary water stress corrosion. The purpose of the thermal sleeve (of nickel-based alloy) is to protect the pressurizer surge and spray line nozzles against the effects of thermal cycling. Ms. Liu stated that the applicant has demonstrated, by their analysis, to the staff that growth of potential cracks into the nozzle can not occur because the sleeves are not welded into the nozzles. Therefore, the staff concluded that although fatigue and stress corrosion induced cracking could occur in the thermal sleeves, an aging management program is not required.

Dr. Powers, ACRS Member, asked the staff if there was a gap between the sleeve and the nozzle and if there is aggressive chemistry in that crevice region. In response, Mr. Hale stated that they perform inspections at various locations in the system to confirm whether crevice corrosion in chemistry-controlled systems has been observed. To date, no incident of crevice corrosion has been observed. Mr. Medoff, staff engineer, stated that the staff has found the applicant's water chemistry program acceptable.

Mr. Rosen, ACRS Member, asked if the spray nozzle thermal sleeve were to break off, where would the pieces go. Mr. Hale stated that the design included baskets that are tack welded to the bottom of the thermal sleeve. Any loose piece will be trapped by these baskets. They also have a loose parts monitoring program.

Ms. Liu then addressed the issue of a non-segregated phase bus that is used to connect offsite power source to safety-related buses. Ms. Liu stated that the applicant proposed an aging management program for non-segregated phase bus issues since it could not verify the aging properties of insulating materials.

With regard to the issue of phosphate ion concentration in groundwater that could potentially affect below-ground concrete structures, Mr. Dudley stated that the additional data from research will be required to determine what, if any, limits on phosphate concentration in below-grade groundwater are necessary. He said that the concentration of phosphate in the groundwater is insignificant and due to a high concentration of chlorides and sulfates, the groundwater is considered aggressive. He further stated that the staff intends to request the Office of Nuclear Regulatory Research (RES) to initiate a focused study to provide NRR with the information to make this determination.

Mr. Dudley presented the analyses results of the reactor vessel upper shelf energy, pressurized thermal shock reference transition temperatures, and temperature-pressure curves. He stated that the staff performed independent calculations which confirmed that the upper shelf energy of the various areas of the reactor vessel projected to the end of the period of extended operation is well below the acceptance criteria.

Mr. Dudley then discussed and provided details of the repairs that took place at St. Lucie Unit 1 to deal with damage identified in 1983 in the core support barrel (CSB) and thermal shield assemblies. The thermal shield was permanently removed. Four lugs were found to have separated from the CSB and through-wall cracks were found adjacent to the lug areas. These cracks were arrested with crack-arrestor holes that were sealed by inserting expandable plugs. The repairs were qualified for the remaining life of the plant and have been repeatedly inspected and found to be effective. In order to qualify these repairs for 60-years of life, the fatigue analysis of the CSB middle cylinder and the acceptance criterion for the expandable-plugs preload based on irradiation-induced stress relaxation had to be repeated to cover 60-years of operation. Mr. Dudley stated that the staff performed a thorough review of this TLAA and found it acceptable.

Mr. Rosen, ACRS Member, asked if the plug were to come out and bypass flow is increased, would you be able to detect the increased bypass flow from any core thermal or flow parameters. In response, Mr. Hale stated that they will be able to detect the increased bypass flow. Mr. Hale also stated that the inservice inspections to which the CSB will continue to be subjected provide reasonable assurance that the integrity of the CSB will be adequately monitored and maintained during the period of extended operation.

Committee Action

The Committee issued a report to the NRC Chairman on this matter dated September 17, 2003 in which it recommended that the application be approved.

IV. Draft Final Regulatory Guide DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities" (Open)

[Note: Mr. Michael R. Snodderly was the Designated Federal Official for this portion of the meeting]

Dr. George Apostolakis, the cognizant Committee member for this issue, introduced the topic. He mentioned that the development of guidance for determining the technical adequacy of probabilistic risk assessment (PRA) results has been a major issue as evidenced by recent articles in the Inside NRC. He reminded the Committee of its recent letters on DG-1122 and PRA quality. Dr. Apostolakis said that the staff was here to respond to the Committee's comments on the draft version of this regulatory guide and is seeking the ACRS' recommendation that the draft final regulatory guide be published for trial use.

NRC Staff Presentation

The main presenter from the staff was Ms. Mary Drouin, RES. She was supported by Gareth Parry, NRR. Other staff members in attendance from NRR included: Michael Johnson, Michael Tschiltz, Don Harrison, Steve Long, and Glenn Kelly. Ms. Drouin provided background on the development of the Regulatory Guide and declared it ready for trial use.

During the above discussions, the NRC staff and the ACRS Members made the following points:

- Dr. Apostolakis asked what had happened to the definition of dominant. Dr. Parry responded it had been eliminated.
- Ms. Drouin then went through the public comments received from six organizations. The majority of the comments were on Appendix A of the ASME standard. Only minor editorial comments on the staff's position NEI 00-02 and the NEI self-assessment process were noted. No comments were received on Standard Review Plan (SRP) Chapter 19.1. Ms. Drouin stated that there was consensus that the staff should move forward to publish the guide for trial use and test the guide via pilot applications.
- Mr. Rosen asked about the relationship between RG 1.174 and DG-1122. Ms. Drouin explained that DG-1122 is a supporting regulatory guide to those like RG 1.174. DG-1122 provides guidance for determining whether or not the risk insights used to support the proposed change are adequate.
- Dr. Apostolakis asked if they meant 95 percent of the CDF instead of, "... when ranked comprise 95 percent of the CDF." Dr. Parry said ranked in numerical order is what was meant. Several members suggested clarifying the wording. Ms. Drouin responded that the need for clarification would be identified during the pilot applications but that definitions of key terms were needed to begin the pilots.
- Dr. Wallis asked what was meant by greater than approximately one percent. Ms. Drouin agreed that it should be greater than one percent.
- Mr. Rosen asked what was meant by a source of uncertainty related to an issue where there was no consensus approach. Dr. Parry said that, although there is considerable uncertainty associated with reactor coolant pump seal failure models, the issue has been well studied and a consensus approach exists. Further consideration of these types of issues is not necessary when the consensus model has been incorporated into the user's PRA.
- Ms. Drouin then discussed the ACRS' comment that the draft final regulatory guide should include guidance on how to perform sensitivity and uncertainty analyses. Ms. Drouin stated that the staff was developing this guidance and it would be published in a separate draft regulatory guide. Dr. Parry clarified that the draft regulatory guide would provide guidance on how to take into account uncertainties and sensitivities when making decisions relative to acceptance guidelines.
- Dr. Apostolakis cautioned about using sensitivity analyses as a substitute for uncertainty analyses. Ms. Drouin agreed. Dr. Apostolakis then asked what was the schedule for developing the draft regulatory guide for performing uncertainty and sensitivity analyses. Ms. Drouin said that she would like to see a draft of this regulatory guide in early 2004.

- Dr. Apostolakis asked about Category 1 assessments being able to use generic data even if the plant had a relatively higher failure rate. Ms. Drouin said that there is a supporting requirement in the ASME standard that has the user in the account.

NEI Presentation

The main presenter from the Nuclear Energy Institute (NEI) was Mr. Tony Pietrangelo. During the above discussions, Mr. Pietrangelo and the ACRS Members made the following points:

- Mr. Pietrangelo stated that the objective of the regulatory guide was to make the review of applications more focused and consistent. He felt that it was important to issue the regulatory guide for trial use now in the absence of such guidance. He also said that issuing it for trial use was a good idea because it is anticipated that lessons will be learned that will need to be incorporated into a revision of the regulatory guide.
- Mr. Pietrangelo said there were six plants that would be good pilots for testing the regulatory guide.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 22, 2003. The Committee recommended that the draft final regulatory guide be issued for trial use with an appropriate sample of pilot plants. The Committee looks forward to reviewing guidance being developed by the NRC staff on how to perform sensitivity and uncertainty analyses in early 2004.

- V. Technical Assessment and Proposed Recommendations for Resolving GSI-189, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"
(Open)

[Note: Mr. Marvin D. Sykes was the Designated Federal Official for this portion of the meeting]

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding proposed recommendations for resolving Generic Issue 186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants."

NUREG-1774, "Survey of Crane Operating Experience at U.S. Nuclear Power Plants from 1968 through 2002," summarized the number, type, and severity of load drop events that continue to occur at operating plants. It notes that human error and rigging deficiencies below the hook account for many of the observed load drop events. Finally, the report concludes that licensees could have reduced the frequency of crane operating events attributable to human error if they had focused appropriate attention on the crane operating practices described in NUREG-0612.

Committee's Action

The Committee issued a report to the Executive Director for Operations, William D. Travers on this matter dated September 24, 2003, agreeing with the staff position that regulatory action is needed to reduce the number and potential severity of heavy load drop events. The Committee noted that while these events do not pose a high nuclear plant safety risk, they do raise significant concerns regarding worker safety.

The Committee also concurred with the staff recommendation to endorse ASME NOG-1 for single-failure-proof cranes to clarify the requirements for the construction or upgrade of cranes to the single-failure-proof crane category, which is referred to in NUREG-0612.

VI. Draft Final Review Standard for Reviewing Core Power Uprate Applications (Open)

[Note: Mr. Ralph Caruso was the Designated Federal Official for this portion of the meeting]

The staff presented its most recent version of Review Standard RS-001, "Review Standard for Extended Power Uprates," following the resolution of comments received from the public. Mr. Marsh opened the meeting with an overview of previous meetings between the Committee and the staff on this subject. The need for the review standard was first identified by the Maine Yankee Lessons Learned Task Force, and following extensive staff experience, the staff presented its draft to the Committee in December, 2002. It was then issued for public comment, and after the comments were resolved, the staff described its efforts to the Committee. Mr. Shuaibi followed the introduction with a presentation of the public comments that had been received, and the staff response. The staff intends to use the upcoming Vermont Yankee (VY) power uprate request as a pilot program for this effort. It is willing to continue the dialogue with the Committee on the subject of materials degradation issues, regarding VY, as they arise.

The purpose of developing the review standard included (1) standardization of the staff review process, (2) predictability of the process and its results, and (3) retention of corporate memory. The standard will be a living document, and the staff will be encouraged to re-assess the guidance and update them to reflect new information that arises.

During the discussion of the review standard, Mr. Rosen commented that he thought that it was important for licensees to justify any proposals to not perform integral startup transient tests, and the staff agreed that it would require licensees to provide justification for eliminating these tests from their power uprate programs.

During earlier Committee reviews of the Standard, it identified concerns about the requirements for independent calculations, and the criteria for integral system transient testing. The Committee concluded that the staff had satisfactorily addressed these concerns with consistent guidance about when independent calculations are appropriate, and by requiring integral system transient testing unless licensees can provide an adequate justification otherwise.

Committee Action

The Committee recommended that the Review Standard be released for use in the review of future applications for extended power uprates.

VII. Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA (Open)

[Note: Mr. Ralph Caruso was the Designated Federal Official for this portion of the meeting]

The Committee heard a presentation from the staff about the subject Regulatory Guide (RG), which is part of the staff resolution of GSI-191, "PWR Sump Blockage." The staff discussed the RG with the Committee in February, 2003, and had subsequently issued it for public comment. The version that was presented to the Committee on September 11, 2003 included staff consideration of the public comments.

Dr. Chang, RES, and Dr. Letellier, Los Alamos National Laboratory, presented background on the GSI, including its history and the reasons for issuing the revision. The PWR sections were revised to enhance the debris blockage evaluation guidance, some changes were made to the BWR sections to be consistent with the PWR sections, and now the RG includes guidances that was previously contained in RG 1.1 on NPSH for ECCS pumps. Eighty-nine comments were received from the public, and the staff believes they have all been addressed. Dr. Letellier described the methodology to account for debris sources and generation, for debris transport, and for sump-screen head loss. RES is continuing to work on reports to address Cal-Sil head loss across the screens, and chemical reactions inside containment that may lead to the formation of gel-like materials. Long-term research is continuing on debris sample characterization, additional head loss tests, and HPSI throttle valve clogging. An international workshop on the issue will be held in February or March 2004. All RES activities are scheduled to be completed by the end of FY04.

Committee Action

The Committee recommended that the RG be issued, but additional technical work remains to be performed (1) to develop a technical basis to resolve issues related to chemical reactions inside the containment, (2) to develop an acceptable method that can be used directly as guidance for the analysis of sump blockage. In addition, the Committee recommended that the staff consider the possibility that the uncertainties associated with the calculational methodology may be so large, or that strainers may prove to be so susceptible to debris blockage, that alternative solutions may be required to ensure long term core cooling. The Committee also believes that the staff should investigate a risk-informed approach to sump screen blockage.

VIII. Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems" (Open)

[Note: Mr. Michael R. Snodderly was the Designated Federal Official for this portion of the meeting]

Dr. William Shack, the cognizant Committee member for this issue, introduced the topic. Dr. Shack explained that Revision 1 to Regulatory Guide 1.53, "Application of the Single-Failure Criterion to Safety Systems," endorses IEEE Std 379-2000, "IEEE Standard Application of the Single-Failure Criterion to Nuclear Power Generating Systems." He then introduced the author of Revision 1 to RG 1.53, Satish Aggarwal, and David Zaprazny, who is the Chairman of the IEEE working group that developed IEEE Std 379-2000.

NRC Staff Presentation

The main presenter from the staff was Mr. Satish Aggarwal, RES. He was supported by Paul Loeser, NRR and David Zaprazny, IEEE. Mr. Aggarwal provided a description of the development of Revision 1 to RG 1.53.

During the above discussions, the NRC staff and the ACRS Members made the following points:

- Mr. Aggarwal said that the purpose of the briefing was to seek the ACRS' recommendation that Revision 1 to RG 1.53 be issued.
- Mr. Aggarwal then defined single failure as a safety system being able to perform its safety functions for a design basis accident in the presence of any detectable failure within the safety system.
- Mr. Rosen asked why we are doing this and Mr. Aggarwal said that it is commission policy to look at the IEEE on a national consensus standard on single failure criteria for power and electrical systems.
- Dr. Bonaca said that the single failure criterion is really a casualty analysis to determine how it is capable of performing its function with a single failure. He suggested that possible multiple offenders should be considered.
- Mr. Loeser pointed out that RG 1.53 had not been updated since it endorsed the 1972 version of IEEE Std 379.
- Dr. Powers asked about software controlled digital systems with design requirements embedded in them that may in fact be flawed. Mr. Loeser responded that Branch Technical Position 19 requires a diverse method not subject to the same single failure to accomplish the same basic function. Mr. Loeser said that this why if you have all of the

software and all four channels using identical software there is supposed to be some alternative way to perform the function in case that software fails to perform its function.

- Mr. Aggarwal then described changes to RG 1.53 in response to back fit concerns raised in public comments and from the CRGR.
- Mr. Leitch asked if a licensee voluntarily proposed modifications to a safety system and if it did not comply with the latest standard would that be because of rejection of the modification. Mr. Loeser responded that it would not the modification would only have to meet the version of the RG that they had committed to as part of their licensing basis.
- Mr. Aggarwal then discussed the significant technical changes between 1972 and what the staff is proposing to endorse. These changes included: a requirement for a single failure analysis in a design using digital computers, and application of the single failure criterion to shared systems.
- Mr. Aggarwal stated that a probabilistic risk assessment shall not be used in lieu of the single failure analysis. He then added that a failure can be excluded from a single failure analysis based on probabilistic risk assessment, engineering judgement, or operational experience.

Committee Action

The Committee issued a report to the Commission on this matter dated September 22, 2003. The Committee recommended that Revision 1 to Regulatory Guide 1.53 be issued. The Committee does not expect a response to this report.

IX. Draft Final Regulatory Guide DG-1099, "Anchoring Components and Structural Supports in Concrete" (Open)

[Note: Dr. B.P. Jain was the Designated Federal Official for this portion of the meeting]

The Committee considered the draft final regulatory guide DG-1099, "Anchoring Components and Structural Supports in Concrete." The draft regulatory guide provided guidance on the design, analysis, and inspection of steel embedments used to anchor components and structural supports to concrete. The Committee decided not to review DG-1099.

Committee Action

The Committee agreed with the staff's proposal to issue this regulatory guide for industry use. The ACRS Executive director issued a letter to the NRC Executive Director for Operations on this matter dated September 15, 2003.

X. Executive Session (Open)

[Note: Dr. John T. Larkins was the Designated Federal Official for this portion of the meeting.]

A. Reconciliation of ACRS Comments and Recommendations

[Note: Mr. Sam Duraiswamy was the Designated Federal Official for this portion of the meeting.]

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the response from the EDO dated August 4, 2003, to the ACRS report dated May 16, 2003, concerning Improvement of the Quality of Risk Information for Regulatory Decisionmaking. The Committee decided that it was satisfied with the EDO's response.

In its response, the EDO stated that the ASME Standard needs additional guidance in interpreting and applying some of the supporting level requirements. The peer-review team intends to provide this feedback to ASME. The staff also intends to add this guidance, where appropriate, in DG-1122. The staff plans to meet with the Committee as the above guidance is developed.

- The Committee considered the response from the EDO dated August 8, 2003, to the ACRS report dated June 24, 2003, concerning Update to License Renewal Guidance Documents. The Committee decided that it was satisfied with the EDO's response.

The Committee would like to review the results of the RES study and NRR decision on setting a limit on phosphate ion concentration

- The Committee considered the response from the EDO dated August 11, 2003, to the ACRS report dated May 16, 2003, concerning the Vessel Head Penetration Cracking and Reactor Pressure Vessel Degradation. The Committee decided that it was satisfied with the EDO's response and would further like to review the following:

— the new models, improvements to the inspection requirements, and other related revisions to regulatory requirements that are stated to be developed by the staff when the root cause of the South Texas Project cracking is known.

— the results of RES studies on low-alloy steels exposed to boric acid solutions as well as the models based on those studies.

— the RES work to address the capability and reliability of VHP inspection techniques.

— the RES longer-term program to explore other types of degradation and other sites that could be susceptible to PWSCC in Alloy 600 as well as the broad-based research plan.

— the integrated analysis method developed by RES to support evaluations of inspection techniques and intervals for long-term management of VHP degradation and incorporation in risk assessments.

- The Committee considered the response from the EDO dated August 21, 2003, to the ACRS report dated July 16, 2003, concerning Safety Culture. The Committee decided that it was satisfied with the EDO's response.

The Committee would like to be briefed on further developments of agency activities in the safety culture area.

B. Report on the Meeting of the Planning and Procedures Subcommittee

The Committee heard a report from ACRS Chairman and the Executive Director, ACRS, regarding the Planning and Procedures Subcommittee meeting held on September 9, 2003. The following items were discussed:

Review of the Member Assignments and Priorities for ACRS \Reports and Letters for the September ACRS meeting

Member assignments and priorities for ACRS reports and letters for the September ACRS meeting were discussed. Reports and letters that would benefit from additional consideration at a future ACRS meeting were also discussed.

Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through November 2003 was addressed. The objectives were:

- Review the reasons for the scheduling of each activity and the expected work product and to make changes, as appropriate
- Manage the members' workload for these meetings
- Plan and schedule items for ACRS discussion of topical and emerging issues

During this session, the Subcommittee also discussed and developed recommendations on items included in the Future Activities List.

Meeting with the NRC Commissioners

The ACRS met with the NRC Commissioners on Thursday, October 2, 2003, to discuss items of mutual interest. Topics approved by the Commission for this meeting were:

I. Overview

- Risk-informing 10 CFR 50.46 and proposed
- 10 CFR 50.69
- License renewal activities
- Review of AP 1000 designs
- Preapplication review of ESBER design
- Power uprate review standard
- Future ACRS activities

II. Advancement of PRA technology in Risk-Informed Decisionmaking

III. Materials Degradation Issues

IV. Reactor Oversight Process

ACRS Review of Power Upgrades

A draft letter from Ledyard Marsh (NRR) to John Larkins was discussed. The letter proposed that the ACRS consider not reviewing a proposed 6 percent stretch power uprate for the Kewanee Nuclear Power Plant (KNPP). The draft letter described the power uprate history related to completed plant modifications, and the additional plant modifications needed to support the proposed uprate. The staff is requesting an ACRS decision as soon as reasonably feasible to facilitate the staff's allocation of resources and scheduling of its review.

The ACRS has as a matter of established practice been reviewing power upgrades of 5 percent or more. The Committee may want to reconsider this in view of its current workload and the existence of a standard review plan for power uprate reviews. The NRC staff has been informed that the ACRS will consider its review of power upgrades of 5 percent or more on a case-by-case basis, based on NRC staff requests such as was provided for KNPP. The ACRS staff will separately provide the Planning and Procedures Subcommittee with an analysis of all proposed upgrades and identify any unique aspects of the uprate that merit Committee attention.

NRC Staff Analysis of the Alvarez Paper on Spent Fuel Pool Vulnerabilities

The ACRS members were provided a package containing the Alvarez paper on spent fuel pool (SFP) vulnerabilities, the NRC staff response to this paper, and an article from the August 25, 2003, edition of NEI's "Nuclear Energy Overview." The topic is likely to generate continued controversy. The ACRS Subcommittee on Safeguards and Security discussed SFP

505th ACRS Meeting
September 10-13, 2003

vulnerabilities on July 9, and the ACRS will discuss SFP vulnerabilities on September 10, 2003, and plans to write a report on this subject during the September ACRS meeting.

Switchyard Initiated Scrams

Graham Leitch has recommended that the NRC staff brief the ACRS on the operating experience with switchyard initiated scrams during which the staff should address the following guidelines:

- Are the recent switchyard initiated scrams indicative of a statistically significant event and are these scrams a safety concern?
- Does the staff believe that aging issues or changes in utility substation operating or maintenance practices are factors in these failures?
- What actions does the staff plan to take?

Related to this matter, RES issued a report on grid reliability titled, "Operating Experience Assessment - Effects of Grid Events on Nuclear Power Plant Performance," on May 1, 2003. The members have been sent copies of this RES report.

For the Subcommittee's information Chairman Diaz has been appointed to a joint US-Canada Working Group that will search for the cause of the August 14 power outage. The Task Force will be chaired by Energy Secretary Abraham and his Canadian counterpart, Natural Resources Minister Dhaliwal. Sam Collins is also a member of this Working Group. Please note that NRC activities related to the August 14 power outage or to grid issues are to be coordinated through the Office of the Chairman.

Near-Term ACRS Safeguards and Security Schedules

A list of and schedules for proposed near term ACRS Safeguards and Security activities was discussed. These are based on our current knowledge as to when NRC staff work products will be available and projections of ACRS workload. This list includes having the ACNW take the lead responsibility for the NRC staff's work on RDDs and related modifications to the MACCS code. Plans for FY 04 and FY 05 ACRS activities and what was learned in the ACRS September 10, 2003, discussions, will be discussed during the October 2003 Planning and Procedures Subcommittees.

Followup from the July 2003 Meeting with the EDO

The following items may require additional action by the ACRS:

- Regarding the views on ROP, the NRC staff continues to believe that the PI thresholds are providing necessary information for informed decisions and appropriate actions.

505th ACRS Meeting
September 10-13, 2003

- The EDO staff will develop a suitable mechanism to track the progress of commitments made by NRC staff in response to the ACRS recommendations.
- The EDO will notify the ACRS when there are changes in commitments made to the Committee.

ACRS Evaluation of RES Programs

RES has been charged by the NRC's EDO to establish a process to evaluate the effectiveness/utility of its programs. This evaluation is mandated from the Government Results and Performance Act and needs to be in place during the next fiscal year. Mike Mayfield has requested that Dr. Larkins discuss this matter with the ACRS and assess whether or not the Committee has an interest in evaluating RES Programs in a more quantitative manner than it does presently in its biannual report on the research program. If the ACRS is interested, then Mayfield will meet with the Committee during the Planning and Procedures session and discuss this matter.

Member Issues

- George Apostolakis proposes to have the NRC staff brief the ACRS on current agency activities related to Safety Culture and assess whether another letter on this matter would be appropriate.
- George Apostolakis also recommends that the ACRS be briefed on NRC activities related to Digital Instrumentation and Control.
- The ACRS/ACNW office staff maintains files containing the documents that identify areas where members may have conflicts of interests regarding their involvement in Committee reviews. To facilitate the identification of conflicts of interest that arise from new work that members become involved in between their yearly filings with the OGC, Dr. Bahadur plans to conduct periodic e-mail surveys of all of the members.

C. Future Meeting Agenda

Appendix IV summarizes the proposed items endorsed by the Committee for the 506th ACRS Meeting, October 1-3, 2003.

The 505th ACRS meeting was adjourned at 12:30 pm on Saturday, September 13, 2003.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001

October 28, 2003

MEMORANDUM TO: ACRS Members

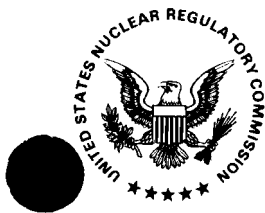
FROM: Sherry Meador *Sherry Meador*
 Technical Secretary

SUBJECT: PROPOSED MINUTES OF THE 505th MEETING OF THE
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS -
 SEPTEMBER 10-13, 2003

Enclosed are the proposed minutes of the 505th meeting of the ACRS. This draft is being provided to give you an opportunity to review the record of this meeting and provide comments. Your comments will be incorporated into the final certified set of minutes as appropriate, which will be distributed within six (6) working days from the date of this memorandum.

Attachment:
As stated

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001



November 10, 2003

MEMORANDUM TO: Sherry Meador, Technical Secretary
Advisory Committee on Reactor Safeguards

FROM: Mario V. Bonaca *Mario V. Bonaca*
Chairman

SUBJECT: CERTIFIED MINUTES OF THE 505th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
(ACRS), SEPTEMBER 10-13, 2003

I certify that based on my review of the minutes from the 505th ACRS full Committee meeting, and to the best of my knowledge and belief, I have observed no substantive errors or omissions in the record of this proceeding subject to the comments noted below.

the operation of an expedition to Antarctica. EZ Productions, Inc. will conduct filming operations in Antarctica using the Kapitan Dranitsyn as the main support platform. Basic toilet facilities will be taken onto the sea ice for use during filming and in case of emergency. Food preparation will mainly take place on the ship. Snacks and buffet style food will be taken to the filming locations during the day. This application is for all wastes generated off the ship, associated with the filming work at Cape Washington and environs (or alternate location at Coulman Island). Anything taken ashore will be removed from Antarctica and disposed of in a substitutable port of disembarkation. Cooking stoves/fuel will be used only in an emergency. Conditions of the permit would include requirements to report on the removal of materials and any accidental releases, and management of all waste, including human waste, in accordance with Antarctic waste regulations.

Application for the permit is made by: Hawk Koch, Co-Producer, EZ Productions, Inc., 9100 Wilshire Boulevard, Suite 401E, Beverly Hills, California 90212.

Location: Antarctic Peninsula Area.

Dates: November 01, 2003 to March 31, 2006.

Nadene G. Kennedy,
Permit Officer.

[FR Doc. 03-21473 Filed 8-21-03; 8:45 am]

BILLING CODE 7555-01-M

NUCLEAR REGULATORY COMMISSION

Notice of Extension of the Public Comment Period for Scoping Process To Prepare an Environmental Impact Statement for the License Renewal of Nuclear Power Plants

Notice is hereby given that the U.S. Nuclear Regulatory Commission (the Commission) has extended the public comment period for the scoping process on the update to the "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants", NUREG-1437 (May 1996) and Addendum 1 (August 1999). The public comment period is extended to September 17, 2003.

The GEIS and Addendum 1 to the GEIS were prepared pursuant to 10 CFR part 51 and are available for public inspection at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, or from the Publicly Available Records component

of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible at <http://www.nrc.gov/reading-rm/adams.html>, which provides access through the NRC's Public Electronic Reading Room (PERR) link. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff at 1-800-397-4209, or 301-415-4737, or by e-mail to PDR@nrc.gov. The GEIS, Addendum 1, and Supplements may also be viewed on the Internet at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/>. The NRC prepares site-specific supplements to the GEIS for each license renewal application assessing the environmental impacts specific to that power plant location; these reports may be useful to scoping participants to understand the environmental review process and the environmental issues associated with the review for license renewal. The Supplements to the GEIS can also be viewed on the Internet in the context for each project and are listed by project at <http://www.nrc.gov/reactors/operating/licensing/renewal/applications.html>. The update of the GEIS is a generic activity and, therefore, is not the appropriate forum to consider site-specific issues or concerns.

Any interested party may send written comments on the environmental scope of the GEIS Update Project to the 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. Comments may also be delivered to Room T-6 D59, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland, from 7:30 a.m. to 4:15 p.m. during Federal workdays. To be considered in the scoping process, written comments should be postmarked by September 17, 2003. Electronic comments may be sent by e-mail to the NRC at LRGEISUpdate@nrc.gov. Electronic submissions should be sent no later than September 17, 2003, to be considered timely in the scoping process. All comments received by the NRC will be available electronically and accessible through the NRC's PERR link at <http://www.nrc.gov/reading-rm/adams.html>.

FOR FURTHER INFORMATION CONTACT: Mr. Barry Zalzman, Environmental Section, License Renewal and Environmental Impacts Program, Division of Regulatory Improvement Programs, U.S. Nuclear Regulatory Commission, Washington,

DC 20555. Mr. Zalzman may be contacted by telephone at 1-800-368-5642, extension 2419, or by e-mail at LRGEISUpdate@nrc.gov.

Dated at Rockville, Maryland, this 15th day of August, 2003.

For the Nuclear Regulatory Commission.

John R. Tappert,

Acting Program Director, License Renewal and Environmental Impacts Program, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation.

[FR Doc. 03-21524 Filed 8-21-03; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards; Meeting Notice

In accordance with the purposes of sections 29 and 182b. of the Atomic Energy Act (42 U.S.C. 2039, 2232b), the Advisory Committee on Reactor Safeguards (ACRS) will hold a meeting on September 10-13, 2003, 11545 Rockville Pike, Rockville, Maryland. The date of this meeting was previously published in the *Federal Register* on Monday, November 20, 2002 (67 FR 70094).

Wednesday, September 10, 2003

[The meeting on Wednesday, September 10, 2003 will be closed pursuant to 5 U.S.C. 552b(c)(1)]

10:15 a.m.-7 p.m.: Safeguards and Security (Closed)—The Committee will meet with representatives of the Office of Nuclear Regulatory Research and the Office of Nuclear Security and Incident Response to discuss safeguards and security matters. Also, the Committee will discuss a proposed ACRS report on safeguards and security matters.

Thursday, September 11, 2003, Conference Room T-2B3, Two White Flint North, Rockville, Maryland

8:30 a.m.-8:35 a.m.: Opening Remarks by the ACRS Chairman (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 a.m.-10 a.m.: Final Review of the St. Lucie License Renewal Application (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff and Florida Power and Light Company regarding the St. Lucie license renewal application and the associated Final Safety Evaluation Report prepared by the staff.

10:15 a.m.-11:30 a.m.: Draft Final Regulatory Guide DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities" (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the draft final version of Regulatory Guide DG-1122.

12:30 p.m.–2 p.m.: *Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"* (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the technical assessment and recommendations proposed by the Office of Nuclear Regulatory Research for resolving GSI-186.

2:15 p.m.–3:45 p.m.: *Draft Final Review Standard for Reviewing Core Power Uprate Applications* (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the draft final review standard to be used by the staff for reviewing core power uprate applications.

4 p.m.–5:15 p.m.: *Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA"* (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding draft final revision 3 to Regulatory Guide 1.82 (DG-1107) including resolution of public comments, and related matters.

5:15 p.m.–6 p.m.: *Review of PIRT Process* (Open)—The Committee will hear a presentation by Dr. Nourbakhsh, ACRS Senior Fellow, regarding his review of the phenomena identification and ranking table (PIRT) process.

6:15 p.m.–7:30 p.m.: *Preparation of ACRS Reports* (Open/Closed)—The Committee will discuss proposed ACRS reports on matters considered during this meeting. In addition, the Committee will discuss a proposed ACRS report on safeguards and security matters (Closed).

Friday, September 12, 2003, Conference Room T-2B3, Two White Flint North, Rockville, Maryland

8:30 a.m.–8:35 a.m.: *Opening Remarks by the ACRS Chairman* (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 a.m.–9:30 a.m.: *Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems"* (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the draft final revision 1 to Regulatory Guide 1.53.

9:30 a.m.–11:15 a.m.: *Preparation for Meeting with the NRC Commissioners* (Open)—The Committee will discuss proposed topics for discussion during the ACRS meeting with the NRC Commissioners which is scheduled to be held on Wednesday, October 1, 2003, between 9:30 and 11:30 a.m.

11:15 a.m.–11:30 a.m.: *Subcommittee Report on Fire Protection Issues* (Open)—The Fire Protection Subcommittee Chairman will provide a brief report on matters discussed during the September 9, 2003 meeting.

11:30 a.m.–12:15 p.m.: *Future ACRS Activities/Report of the Planning and Procedures Subcommittee* (Open)—The Committee will discuss the recommendations of the Planning and Procedures

Subcommittee regarding items proposed for consideration by the full Committee during future meetings. Also, it will hear a report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.

12:15 p.m.–12:30 p.m.: *Reconciliation of ACRS Comments and Recommendations* (Open)—The Committee will discuss the responses from the NRC Executive Director for Operations (EDO) to comments and recommendations included in recent ACRS reports and letters. The EDO responses are expected to be made available to the Committee prior to the meeting.

1:30 p.m.–7:30 p.m.: *Preparation of ACRS Reports* (Open/Closed)—The Committee will discuss proposed ACRS reports on matters considered during this meeting. In addition, the Committee will discuss a proposed ACRS report on safeguards and security (Closed).

Saturday, September 13, 2003, Conference Room T-2B3, Two White Flint North, Rockville, Maryland

8:30 a.m.–1 p.m.: *Preparation of ACRS Reports* (Open/Closed)—The Committee will continue discussion of the proposed ACRS reports.

1 p.m.–1:15 p.m.: *Miscellaneous* (Open)—The Committee will discuss matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

Procedures for the conduct of and participation in ACRS meetings were published in the *Federal Register* on October 11, 2002 (67 FR 63460). In accordance with those procedures, oral or written views may be presented by members of the public, including representatives of the nuclear industry. Electronic recordings will be permitted only during the open portions of the meeting. Persons desiring to make oral statements should notify the Associate Director for Technical Support named below five days before the meeting, if possible, so that appropriate arrangements can be made to allow necessary time during the meeting for such statements. Use of still, motion picture, and television cameras during the meeting may be limited to selected portions of the meeting as determined by the Chairman. Information regarding the time to be set aside for this purpose may be obtained by contacting the Associate Director prior to the meeting. In view of the possibility that the schedule for ACRS meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should check with the Associate Director for Technical Support if such rescheduling would result in major inconvenience.

In accordance with subsection 10(d) Public Law 92-463, I have determined that it is necessary to close portions of this meeting noted above to discuss and protect information classified as national security information pursuant to 5 U.S.C. 552b(c)(1).

Further information regarding topics to be discussed, whether the meeting has been canceled or rescheduled, as well as the Chairman's ruling on requests for the

opportunity to present oral statements and the time allotted therefor can be obtained by contacting Dr. Sher Bahadur, Associate Director for Technical Support (301-415-0138), between 7:30 a.m. and 4:15 p.m., e.t.

ACRS meeting agenda, meeting transcripts, and letter reports are available through the NRC Public Document Room at pdr@nrc.gov, or by calling the PDR at 1-800-397-4209, or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS) which is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> or [http://www.nrc.gov/reading-rm/doc-collections/ACRS & ACNWTmtg schedules/agendas/](http://www.nrc.gov/reading-rm/doc-collections/ACRS%20ACNWTmtg%20schedules/agendas/).

Videoteleconferencing service is available for observing open sessions of ACRS meetings. Those wishing to use this service for observing ACRS meetings should contact Mr. Theron Brown, ACRS Audio Visual Technician (301-415-8066), between 7:30 a.m. and 3:45 p.m., e.t., at least 10 days before the meeting to ensure the availability of this service. Individuals or organizations requesting this service will be responsible for telephone line charges and for providing the equipment and facilities that they use to establish the videoteleconferencing link. The availability of videoteleconferencing services is not guaranteed.

Dated: August 18, 2003.

Andrew L. Bates,

Advisory Committee Management Officer.

[FR Doc. 03-21525 Filed 8-21-03; 8:45 am]

BILLING CODE 7590-01-P

OFFICE OF PERSONNEL MANAGEMENT

Submission for OMB Review; Comment Request for a Revised Information Collection: SF-15, Application for 10-Point Veteran Preference

AGENCY: Office of Personnel Management.

ACTION: Notice.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995 (Pub. L. 104-13, May 22, 1995), this notice announces that the Office of Personnel Management (OPM) intends to submit to the Office of Management and Budget (OMB) a request for review of a revised information collection. The Application for 10-Point Veteran Preference (Standard Form 15) is used by agencies, OPM examining offices, and agency appointing officials to adjudicate individuals' claims for veterans' preference in accordance with the Veterans' Preference Act of 1944. OPM intends to update the form to reflect elimination of the Federal Personnel Manual and Standard Form 171 (Application for Federal Employment), and revised forms issued by the



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
 WASHINGTON, D.C. 20555-0001

August 13, 2003

**SCHEDULE AND OUTLINE FOR DISCUSSION
 505th ACRS MEETING
 SEPTEMBER 10-13, 2003**

WEDNESDAY, SEPTEMBER 10, 2003

[The meeting on Wednesday, September 10, 2003 will be closed pursuant to 5 U.S.C. 552b(c)(1)]

- 1) 10:15 - 10:20 A.M. Opening Remarks by the ACRS Chairman (Closed) (MVB/JTL)
- 2) 10:20 - ~~7:00~~^{6:30} P.M. Safeguards and Security Matters (Closed) (MVB/TSK/RPS/RKM)
 (12:30-1:30 P.M. LUNCH)
 - 2.1) Remarks by the Subcommittee Chairman
 - 2.2) Briefing by and discussions with representatives of the Office of Nuclear Regulatory Research and the Office of Nuclear Security and Incident Response to discuss safeguards and security matters. Also, the Committee will discuss a proposed ACRS report on safeguards and security matters.

THURSDAY, SEPTEMBER 11, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 3) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open)
 - 3.1) Opening Statement (MVB/JTL/SD)
 - 3.2) Items of current interest (MVB/SD)
- 4) ~~8:35~~^{9:00} - 10:00 A.M. Final Review of the St. Lucie License Renewal Application (Open) (MVB/GML/BPJ/SD)
 - 4.1) Remarks by the Subcommittee Chairman
 - 4.2) Briefing by and discussions with representatives of NRC staff and Florida Power and Light Company regarding the St. Lucie license renewal application and the associated Final Safety Evaluation Report prepared by the staff.
- 10:00 - 10:15 A.M. *****BREAK*****
- 5) 10:15 - ~~11:30~~^{11:35} A.M. Draft Final Regulatory Guide DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities" (Open) (GEA/MRS)
 - 5.1) Remarks by the Subcommittee Chairman
 - 5.2) Briefing by and discussions with representatives of NRC staff regarding the draft final version of Regulatory Guide DG-1122.

Representatives of the nuclear industry may provide their views, as appropriate.

- 11:35 - 12:35
11:30 - 12:30 P.M. ***LUNCH***
- 6) 12:35 - 2:30
12:30 - 2:00 P.M. Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants" (Open) (JDS/MWW)
- 6.1) Remarks by the Subcommittee Chairman
6.2) Briefing by and discussions with representatives of NRC staff regarding the technical assessment and recommendations proposed by the Office of Nuclear Regulatory Research for resolving GSI-186.
- Representatives of the nuclear industry may provide their views, as appropriate.
- 2:30 - 2:45
2:00 - 2:15 P.M. ***BREAK***
- 7) 2:45 - 4:25
2:45 - 3:45 P.M. Draft Final Review Standard for Reviewing Core Power Uprate Applications (Open) (VHR/RC)
- 7.1) Remarks by the Acting Subcommittee Chairman
7.2) Briefing by and discussions with representatives of NRC staff regarding the draft final review standard to be used by the staff for reviewing core power uprate applications.
- Representatives of the nuclear industry may provide their views, as appropriate.
- ~~3:45 - 4:00 P.M. ***BREAK***~~
- 8) ~~4:20 - 5:50~~
4:00 - 5:15 P.M. Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA" (Open) (GBW/RC)
- 8.1) Remarks by the Subcommittee Chairman
8.2) Briefing by and discussions with representatives of the NRC staff regarding draft final revision 3 to Regulatory Guide 1.82 (DG-1107) including resolution of public comments, and related matters.
- Representatives of the nuclear industry may provide their views, as appropriate.
- 9) 5:15 - 6:00 P.M.
~~6:00 - 6:15 P.M.~~ Review of PIRT Process (Open) (GEA/HPN)
Briefing by Dr. Nourbakhsh, ACRS Senior Fellow, regarding his review of the phenomena identification and ranking table (PIRT) process.
- ~~6:00 - 6:15 P.M. ***BREAK***~~

- 7:00
10) 6:15 - 7:30 P.M. Preparation of ACRS Reports (Open/Closed)
Discussion of proposed ACRS reports on:
- 10.1) Final Review of the St. Lucie License Renewal Application (MVB/GML/BPJ/SD)
 - 10.2) Draft Final Regulatory Guide DG-1122 on PRA Quality (GEA/MRS) (Tentative)
 - 6:10-6:30 10.3) Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants" (JDS/MWW)
 - 10.4) Draft Final Review Standard for Reviewing Core Power Uprate Applications (VHR/RC)
 - 10.5) Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA" (GBW/RC)
 - 10.6) Safeguards and Security Matters (Closed) (MVB/TSK/RPS/RKM)

FRIDAY, SEPTEMBER 12, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 11) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (MVB/JTL/SD)
- 12) 8:35 - 9:30 A.M. Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems" (Open) (WJS/MRS)
- 12.1) Remarks by the Subcommittee Chairman
 - 12.2) Briefing by and discussions with representatives of the NRC staff regarding the draft final revision 1 to Regulatory Guide 1.53.

Representatives of the nuclear industry may provide their views, as appropriate.

- 11:15-12:30
13) ~~9:30 - 11:15~~ A.M. Preparation for Meeting with the NRC Commissioners (Open) (MVB/JTL)
(10:00-10:15 A.M. BREAK)
The Committee will discuss proposed topics for discussion during the ACRS meeting with the NRC Commissioners which is scheduled to be held on Wednesday, October 1, 2003, between 9:30 and 11:30 a.m.

- 14) 11:15 - 11:30 A.M. Subcommittee Report on Fire Protection Issues (Open) (SLR/MDS)
The Fire Protection Subcommittee Chairman will provide a brief report on matters discussed during the September 9, 2003 meeting.

- 3:20 - 4:30
15) 11:30 - 12:15 P.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (MVB/JTL/RPS)
- 15.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.

15.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.

- 16) 12:15 - 12:30 P.M. Reconciliation of ACRS Comments and Recommendations (Open) (MVB, et al./SD, et al.)
Discussion of the responses from the NRC Executive Director for Operations to comments and recommendations included in recent ACRS reports and letters.

12:30 - 1:30 P.M. *LUNCH*****

- 17) 1:30 - 7:30 P.M. Preparation of ACRS Reports (Open/Closed)
Discussion of the proposed ACRS reports on:
- 2:30-3:05
4:50-5:15 17.1) Final Review of the St. Lucie License Renewal Application (MVB/GML/BPJ/SD) *Final*
- 11:15-11:45 17.2) Draft Final Regulatory Guide DG-1122 on PRA Quality (GEA/MRS) ~~(Tentative)~~ *Final*
- 2:20-2:30 17.3) Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants" (JDS/MWW) *Final*
- 5:20-6:30 17.4) Draft Final Review Standard for Reviewing Core Power Uprate Applications (VHR/RC)
- 9/13/03 7:45-11:00 17.5) Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA" (GBW/RC)
8:45-12:30
- 6:30-7:00 17.6) Safeguards and Security Matters (Closed) (MVB/TSK/RPS/RKM)
- 5:15-5:20 17.7) Draft Final Revision 1 to Regulatory Guide 1.53 regarding Single Failure Criterion (WJS/MRS)

SATURDAY, SEPTEMBER 13, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 12:30
18) 8:30 - 1:00 P.M. Preparation of ACRS Reports (Open/Closed)
The Committee will continue discussion of the proposed ACRS reports listed under Item 17.
- 19) 1:00 - 1:15 P.M. Miscellaneous (Open) (MVB/JTL)
~~Discussion of matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.~~

NOTE:

- **Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.**
- **Thirty-Five (35) copies of the presentation materials should be provided to the ACRS.**

APPENDIX III: MEETING ATTENDEES

505TH ACRS MEETING
SEPTEMBER 10-13, 2002

NRC STAFF (September 10, 2003)

J. Arildsen, NSIR
J. Beall, OCM/EJM
M. Cunningham, RES
W. Desmond, NSIR
D. Dorman, RES
F. Eltawila, RES
A. Kuritzky, RES
S. Morris, NSIR
B. Orders, NSIR
R. Prato, NSIR
J. Rosenthal, RES
J. Schaperow, RES
N. Siu, RES
A. Ramey-Smith, RES
S. Stein, NSIR
C. Tinkler, RES
G. Tracey, NSIR
B. Wetzel, NSIR
A. Madison, NSIR
E. Leeds, NRR
C. Nolan, NSIR
D. Overland, NRR
C. Holden, NRR
B. Westreich, NSIR

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

S. Floyd, NEI
R. Weiner, ACNW
M. Levenson, ACNW

NRC STAFF (September 11, 2003)

W. Ruland, NRR	R. Architzek, NRR	T. Koshy, NRR
H. Vandermolen, RES	M. Cora, NRR	J. Hardy, NRR
S. Jones, NRR	G. Suber, NRR	N. Dudley, NRR
J. Flack, RES	R. Auluck, NRR	T. Liu, NRR
H. Wagage, NRR	M. Hartzman, NRR	M. Stutzke, NRR
M. Banerjei, NRR	M. Mitchell, NRR	J. Eads, NRR
C. Li, NRR	S. Coffin, NRR	Q. Nguyen, NRR
J. Hannon, NRR	S. Bailey, NRR	Z. Cruz Perez, NRR
B. Moroney, NRR	S. Miton, NRR	L. Jenkins, NRR
K. Coyne, NRR	R. Svbarathem, NRR	P. Kang, NRR
D. Thatcher, NRR	J. Rowley, NRR	T. J. Kim, NRR
J. Kauffman, RES	N. Iqsal, NRR	B. Darr, NRR
K. Parcezewski, NRR	D. Dube, RES	R. Anand, NRR
J. Tatum, NRR	P. T. Kuo, NRR	B. Moroney, NRR
W. Koo, NRR	T. Tjader, NRR	S. Lee, NRR
T. Scarbrough, NRR	M. Douin, RES	D. Jeng, NRR
R. Eckenrode, NRR	G. Parry, NRR	M. Litz, NRR
E. Leeds, NRR	A. Salomon, RES	R. Young, NRR
L. Marsh, NRR	G. Kelly, NRR	J. Medoff, NRR
S. Peters, NRR	D. Harrison, NRR	H. Ashad, NRR
M. Shuaibi, NRR	H. Chernoff, NRR	G. Morris, NRR
C. Ivu, NRR	M. Johnson, NRR	D. Nguyen, NRR
P. Sekerak, NRR	B. Elliot, NRR	T. Chang, RES
M. Rubin, NRR	K. Manoly, NRR	M. Evans, RES
T. Hsia, RES	M. Mayfield, RES	M. Manoly, NRR
R. Pettis, NRR		

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

B. Beisler, FP&L	J. Meyer, ISL INC. ✓
S. Hale, FP&L	P. Negus, GE
M. Fallin, Constellation Nuclear Services ✓	
B. Grinick, ISL, INC ✓	G. Zegler, ITS Co. ✓
B. Mrowca, ISL, INC ✓	B. Letellier, Los Alamos Natl Lab
B. Bradley, NEI	M. Friedman, OPPD ✓
A. Wyche, SERCH Licensing/Bechtel	
S. Treifoss, LINK	

NRC STAFF (September 12, 2003)

S. Aggarwall, RES

O. Chopra, NRR

P. Loeser, NRR

M. Hart, NRR

C. Dontt, NRR

R. Assa, RES

M. Blumberg, NRR

E. McKenna, NRR

P. Lain, NRR

D. Frankin, NRR

M. Mayfield, RES

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

D. Zarrazny, PPL Susquehanna

S. Traifores, LINK

A. Tabatabai, LINK



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
 WASHINGTON, D.C. 20555-0001

September 17, 2003

**SCHEDULE AND OUTLINE FOR DISCUSSION
 506th ACRS MEETING
 OCTOBER 1-4, 2003**

**WEDNESDAY, OCTOBER 1, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
 ROCKVILLE, MARYLAND**

- 1) 10:15 - 10:20 A.M. Opening Remarks by the ACRS Chairman (Open)
 - 1.1) Opening Statement (MVB/JTL/SD)
 - 1.2) Items of current interest (MVB/SD)

- 2) 10:20 - 12:00 Noon Final Review of the Fort Calhoun License Renewal Application
 (Open) (MVB/GML/MDS/SD)
 - 2.1) Remarks by the Subcommittee Chairman
 - 2.2) Briefing by and discussions with representatives of the NRC staff and the Omaha Public Power District regarding the License Renewal Application for the Fort Calhoun Station Unit 1 and the associated final Safety Evaluation Report prepared by the staff.

- 12:00 - 1:00 P.M. *****LUNCH*****

- 3) 1:00 - 3:00 P.M. Interim Review of the AP1000 Design (Open) (TSK/MME)
 - 3.1) Remarks by the Subcommittee Chairman
 - 3.2) Briefing by and discussions with representatives of the NRC staff and Westinghouse regarding the resolution of open items and related matters.

- 3:00 - 3:15 P.M. *****BREAK*****

- 4) 3:15 - 4:45 P.M. Proactive Material Degradation Assessment Program (Open)
 (FPF/BPJ)
 - 4.1) Remarks by the Subcommittee Chairman
 - 4.2) Briefing by and discussions with representatives of the NRC staff regarding the proposed proactive research program for assessing materials degradation at nuclear power plants.

Representatives of the nuclear industry may provide their views, as appropriate.

4:45 - 5:00 P.M. *****BREAK*****

- 5) 5:00 - 6:15 P.M. Preparation for Meeting with the NRC Commissioners (Open) (MVB et al./JTL et al.)
Discussion of the following topics scheduled for the ACRS meeting with the NRC Commissioners between 9:30 a.m. - 11:30 a.m. on October 2, 2003.
- a) Overview by the ACRS Chairman (MVB)
 - Risk-informing 10 CFR 50.46 and proposed 10 CFR 50.69
 - License renewal activities
 - AP1000 design
 - Preapplication review of ESBWR design
 - Power uprate review standard
 - Future ACRS activities
 - b) Improvement of the Quality of Risk Information for Regulatory Decisionmaking (TSK)
 - c) Materials Degradation Issues (JDS)
 - d) Reactor Oversight Process (WJS)

6:15 - 6:30 P.M. *BREAK*****

- 6) 6:30 - 7:30 P.M. Preparation of ACRS Reports (Open/Closed)
- 6.1) Fort. Calhoun License Renewal Application (MVB/GML/MDS/SD)
 - 6.2) Interim Review of the AP1000 Design (TSK/MME)
 - 6.3) Proactive Material Degradation Assessment Program (tentative) (FPF/BPJ)
 - 6.4) Safeguards and Security (Closed) (TSK/MVB/RPS/RKM)

THURSDAY, OCTOBER 2, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 7) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open)
- 8) 8:35 - 9:00 A.M. Subcommittee Report on the Interim Review of the License Renewal Application for H. B. Robinson Nuclear Power Plant (Open) (GML/BPJ/SD)
Report by and discussions with the Plant License Renewal Subcommittee Chairman regarding the Subcommittee's review of the H. B. Robinson License Renewal Application and the staff's draft Safety Evaluation Report with open items.
- 9) 9:00 - 9:15 A.M. Subcommittee Report on Fire Protection Matters (Open) (SLR/MDS)
Report by and discussions with the Chairman of the Fire Protection Subcommittee regarding matters discussed at the September 9, 2003 meeting.
- 9:15 - 9:30 A.M. ***BREAK*****

10) 9:30 - 11:30 A.M. Meeting with the NRC Commissioners (Open) (MVB et al./JTL et al.)
The Committee will meet with the NRC Commissioners in the Commissioners' Conference Room, One White Flint North to discuss the matters listed under item 5.

11:30 - 12:30 P.M. *LUNCH*****

11) 12:30 - 1:30 P.M. Review of the PIRT Process (Open) (GEA/HPN)
Briefing by and discussions with Dr. Nourbakhsh, ACRS Senior Fellow, regarding his review of the Phenomena Identification and Ranking Table (PIRT) process.

1:30 - 1:45 P.M. *BREAK*****

12) 1:45 - 3:45 P.M. Operating Experience Assessment Report - Effects of Grid Events on Nuclear Power Plant Performance (Open) (GML/SLR/MWW)
12.1) Remarks by the Subcommittee Chairman
12.2) Briefing by and discussions with representatives of NRC staff regarding the staff's report on the effects of grid events (1985-2001) on nuclear power plant performance and related matters.

Representatives of the nuclear industry may provide their views, as appropriate.

3:45 - 4:00 P.M. *BREAK*****

13) 4:00 - 6:00 P.M. Format and Content of the NRC Safety Research Program Report (Open) (DAP/SD/HPN)
Report by and discussions with the Chairman of the Safety Research Program Subcommittee regarding format and content of the annual ACRS report to the Commission on the NRC Safety Research Program as well as assignments for the ACRS members.

6:00 - 6:15 P.M. *BREAK*****

14) 6:15 - 7:30 P.M. Preparation of ACRS Reports (Open/Closed)
Discussion of proposed ACRS reports on:
14.1) Fort Calhoun License Renewal Application (MVB/GML/MDS/SD)
14.2) Interim Review of the AP1000 Design (TSK/MME)
14.3) Proactive Material Degradation Assessment Program (tentative) (FPF/BPJ)
14.4) Operating Experience Assessment Report - Effects of Grid Events on Nuclear Power Plant Performance (tentative) (GML/SLR/MWW)
14.5) Safeguards and Security (Closed) (TSK/MVB/RPS/RKM)

**FRIDAY, OCTOBER 3, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

15) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (MVB/JTL/SD)

16) 8:35 - 10:00 A.M. Draft Final Revision to Regulatory Guide 1.168 (DG-1123),
"Verification, Validation, Review, and Audits for Digital Computer
Software Used in Safety Systems of Nuclear Power Plants" (Open)
(JDS/MME)

16.1) Remarks by the Subcommittee Chairman

16.2) Briefing by and discussions with representatives of the NRC
staff regarding the Draft Final Revision to Regulatory Guide
1.168.

Representatives of the nuclear industry may provide their views, as
appropriate.

10:00 - 10:15 A.M. *BREAK*****

17) 10:15 - 10:45 A.M. Subcommittee Report on Reactor Fuels (Open) (DAP/RC)
Report by and discussions with the Reactor Fuels Subcommittee
Chairman regarding matters discussed at the September 29-30, 2003
meeting.

18) 10:45 - 11:45 A.M. Future ACRS Activities/Report of the Planning and Procedures
Subcommittee (Open) (MVB/JTL/RPS)

18.1) Discussion of the recommendations of the Planning and
Procedures Subcommittee regarding items proposed for
consideration by the full Committee during future ACRS
meetings.

18.2) Report of the Planning and Procedures Subcommittee on
matters related to the conduct of ACRS business, including
anticipated workload and member assignments.

19) 11:45 - 12:00 Noon Reconciliation of ACRS Comments and Recommendations (Open)
(MVB, et al./SD, et al.)

Discussion of the responses from the NRC Executive Director for
Operations to comments and recommendations included in recent
ACRS reports and letters.

12:00 - 1:00 P.M. *LUNCH*****

20) 1:00 - 7:00 P.M. Preparation of ACRS Reports (Open/Closed)

Discussion of the proposed ACRS reports on:

20.1) Fort Calhoun License Renewal Application
(MVB/GML/MDS/SD)

20.2) Interim Review of the AP1000 Design (TSK/MME)

20.3) Proactive Material Degradation Assessment Program
(tentative) (FPF/BPJ)

- 20.4) Operating Experience Assessment Report - Effects of Grid Events on Nuclear Power Plant Performance (tentative) (GML/SLR/MWW)
- 20.5) Draft Final Revision to Regulatory Guide 1.168 (JDS/MME)
- 20.6) Safeguards and Security (Closed) (TSK/MVB/RPS/RKM)

SATURDAY, OCTOBER 4, 2003, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 21) 8:30 - 9:00 A.M. Safeguards and Security (Closed) (GEA/MVB/RPS)
Discussion of issues for inclusion in the ACRS report on risk-informed vulnerability assessment and risk-informed decisionmaking.

[NOTE: This session will be closed pursuant to 5 U.S.C. 552b(c)(1)]
- 22) 9:00 - 1:00 P.M. Preparation of ACRS Reports (Open)
(10:00-10:15 A.M. BREAK) Continue discussion of the proposed ACRS reports listed under Item 20.
- 23) 1:00 - 1:30 P.M. Miscellaneous (Open) (MVB/JTL)
Discussion of matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

NOTE:

- **Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.**
- **Forty-Five (45) copies of the presentation materials should be provided to the ACRS.**

APPENDIX V
LIST OF DOCUMENTS PROVIDED TO THE COMMITTEE
505th ACRS MEETING
SEPTEMBER 10-13, 2003

[Note: Some documents listed below may have been provided or prepared for Committee use only. These documents must be reviewed prior to release to the public.]

MEETING HANDOUTS

AGENDA
ITEM NO.

DOCUMENTS

- 2 Safeguards and Security Matters (Closed)
 - a. Agenda for the September 10, 2003 Safeguards and Security Discussions
 - b. Spent Fuel Pool Studies presentation by C. Tinkler, RES [**Not for Public Disclosure**]
 - c. Nuclear Security presentation by G. Tracey, NSIR [**Not for Public Disclosure**]
 - d. RES Plans for Completing Ongoing Work and FY 04-05 Activities presentation by M. Cunningham, RES [**Not for Public Disclosure**]
 - e. An Approach for Risk-Informed Decisionmaking Using Results of Assessments of Potential Power Reactor Vulnerabilities and Mitigative Strategies presentation by A. Kuritzky, RES [**Not for Public Disclosure**]
- 3 Opening Remarks by the ACRS Chairman
 1. Items of Interest, dated September 11-13, 2003
- 4 Final Review of the St. Lucie License Renewal Application
 2. License Renewal, St. Lucie Plant presentation by Florida Power & Light (Viewgraphs)
 6. St. Lucie Units 1 and 2, License Renewal Safety Evaluation Report, staff presentation N. Dudley, NRR [Viewgraphs]
- 5 Draft Final Regulatory Guide DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities"
 7. Regulatory Guide x.xxx "An Approach for Determining the Technical Adequacy of PRA Results for Risk-Informed Activities" [formerly DG 1122 (and associated SRP)] presentation by M. Drouin, RES [Viewgraphs]
- 6 Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"
 8. A Survey of Crane Operating Experience at U.S. Nuclear Power Plants from 1968 through 2002, Generic Issue 186 presentation by RES [Viewgraphs]
- 7 Draft Final Review Standard for Reviewing Core Power Uprate Applications
 9. Extended Power Uprate Review Standard presentation by NRR [Viewgraphs]

- 8 Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long Term Recirculation Cooling Following a LOCA"
 10. Regulatory Guide 1.82, Rev. 3 "Water Sources for Long-Term Recirculation Cooling Following a LOCA" presentation by RES and Los Alamos National Laboratory [Viewgraphs]

- 12 Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems"
 8. Regulatory Guide 1.53 Rev. 1 Single Failure Criterion presentation by S. Aggarwal, RES [Viewgraphs]

- 15 Future ACRS Activities/Report of the Planning and Procedures Subcommittee
 9. Future ACRS Activities/Final Draft Minutes of Planning and Procedures Subcommittee Meeting - September 10, 2003 [Handout #15]

- 16 Reconciliation of ACRS Comments and Recommendations
 10. Reconciliation of ACRS Comments and Recommendations [Handout #16]

MEETING NOTEBOOK CONTENTS

TAB

DOCUMENTS

- 4 St. Lucie License Renewal Application
1. Table of Contents
 2. Proposed Schedule
 3. Status Report dated September 11, 2003
 4. List of Open Items and their Closure
 5. NRC Inspection Report
 6. Staff response dated August 8, 2003 to ACRS letter regarding update to license renewal guidance documents
 7. ACRS letter to Chairman, USNRC, dated June 24, 2003, regarding update to license renewal guidance documents: Response to Staff Requirements Memorandum dated July 17, 2002
- 5 Draft Final Regulatory Guide DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities"
8. Table of Contents
 9. Proposed Schedule
 10. Status Report dated September 11, 2003
 11. Memorandum dated September ?, 2003, from Scott F. Newberry, RES, NRC, to John T. Larkins, Executive Director, ACRS, Subject: Draft Final Regulatory Guide on an Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities
 12. Report dated April 21, 2003, from Mario V. Bonaca, Chairman, ACRS to Nils J. Diaz, Chairman, NRC, Subject: Proposed Resolution of Public Comments on Draft Regulatory Guide DG-1122, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities"
- 6 Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"
13. Table of Contents
 14. Proposed Schedule
 15. Status Report dated September 11, 2003
 16. Letter to Dr. John Larkins, Subject, "Proposed Regulation and Guidance Development Recommendations for Generic Issue-186, Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"
 17. Completion of Phase II of "Control of Heavy Loads at Nuclear Power Plants" NUREG-0612 (Generic Letter 85-11)

- 7 Review Standard for Extended Power Uprates
 18. Table of Contents
 19. Proposed Schedule
 20. Status Report dated September 11, 2003
 21. "Review Standard for Extended Power Uprates," memorandum from Ledyard B. Marsh to John T. Larkins, August 1, 2003 (previously provided to all members - copies of introductory material attached)
 22. SECY-02-0106, "Review of ACRS Recommendations for the Staff to Develop a Standard Review Plan for Power Uprate Reviews," June 14, 2002 (attached)

- 8 Regulatory Guide 1.82, Revision 3 - "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident"
 23. Table of Contents
 24. Proposed Schedule
 25. Status Report dated September 11, 2003
 26. Regulatory Guide 1.82, Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Cooling Accident," August 2003 (Draft was issued as DG-1107) (previously provided to all members)
 27. Resolution of Public Comments on DG-1107, July 11, 2003, (previously provided to all members)
 28. Trip Report on NEI's PWR Sump Performance Workshop, July 30-31, 2003, S.L. Rosen (attached)

- 12 Draft Final Regulatory Guide 1.53 on Application of the Single-Failure Criterion to Safety Systems
 29. Table of Contents
 30. Proposed Schedule
 31. Status Report dated September 12, 2003
 32. Memorandum dated July 11, 2003, from Ashok Thadani, Director, RES, to John T. Larkins, Executive Director, ACRS, Subject: Revision 1 of Regulatory Guide 1.53, "Application of the Single-Failure Criterion to Safety Systems"
 33. U.S. Nuclear Regulatory Commission, RES, Draft Regulatory Guide DG-1118, "Application of the Single-Failure Criterion to Safety Systems," May 2002

Max
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ADVISORY COMMITTEE REACTOR SAFEGUARD AND SECURITY
505TH FULL COMMITTEE MEETING
SEPTEMBER 10, 2003

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- * William Desmond ✓
- ① Daniel Dorman ✓
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SEPTEMBER 10, 2003

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ACRS

CHRIS NOLAN

NRC/NSIR

Dean Overland

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CORNELIUS HODEN

NRC/NRR

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<u>NAME</u>	<u>NRC ORGANIZATION</u>
William H. Ruland	NRR/DLPM/PD III
Harold VanderMolen	RES/DSARE/REAFB
Steven Jones	NRR/DSSA/SPLB
John Flack	RES/DSARE/REAFB
Harry Wagage	NRR/DSSA/SPLB
Maitri Banerjee	NRR/DLPM/PD III-2
Chang-Yang Li	NRR/DSSA/SPLB
John Hannon	NRR/DSSA/SPLB
FORSTADT Morozov	NRR/DLPM
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Dele Thatcher	NRR/DIPM/IEPB
John Kauffman	RES/DSARE/REAFB
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William Koo	NRR/DE/EMCB
Thomas Scarbrough	NRR/DE/EMEB
Richard Eckenrode	NRR/DIPM/IROB
Eric Leeds	NRR/DLPM
Ladyard Marsh	NRR/DLPM
Sean Peters	NRR/DLPM
Mohammed Shuaibi	NRR/DLPM
CHENG-IA (JOHN) WU	NRR/DE/EMEB
PATRICK SEKERAK	NRR/DE
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<u>NAME</u>	<u>NRC ORGANIZATION</u>
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GREGORY SUBER	NRR/DRIP/RLEP
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STEPHANE COFFIN	NRR/DE/EMCB
Stewart Bailey	NRR/DE/EMEB
S. K. MITON	NRR/RLEP/DRIP
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Jonathan Rowley	NRR/DRIP/RLEP
Naeem Iqbal	NRR/DSSA/SPUB
DONALD DUBE	RES/DRAA/OERAB
P T Kuo	NRR/DRIP/RLEP
T. R. TSADUR	NRR/DIPM/IR05-A/TBS
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Michael Johnson	NRR/DSSA
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<u>KAMAL MANOLY</u> <u>NAME</u>	<u>NRR/DE/EMEB</u> <u>NRC ORGANIZATION</u>
<u>T KOSIAY</u>	<u>NRR/EEIB.</u>
<u>J Hardy</u>	<u>NRR/EEIB</u>
<u>N. DUDLEY</u>	<u>NRR/RLEP</u>
<u>T Liu</u>	<u>"</u>
<u>M STUTZKE</u>	<u>NRR/DSSA/SPSB</u>
<u>J. Eads</u>	<u>NRR/DLPM</u>
<u>Q NGUYEN</u>	<u>NRR/DRIP/RLEP</u>
<u>Z. Cruz Perez</u>	<u>NRR/DRIP/RLEP</u>
<u>Lisa Jenkins</u>	<u>NRR/DRIP/RLEP.</u>
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<u>TJ Kim</u>	<u>NRR/RLEP</u>
<u>Bill DAM</u>	<u>"</u>
<u>Raj Anand</u>	<u>" "</u>
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<u>SAM LEE</u>	<u>NRR/DRIP/RLEP</u>
<u>David Jung</u>	<u>NRR/DE/EMEB</u>
<u>Mark Lintz</u>	<u>NRR/DRIP/RLEP</u>
<u>Ronald Young</u>	<u>NRR/DSSA/SPCB</u>
<u>JAMES MEDOFF</u>	<u>NRR/DE/EMCB</u>
<u>HANS ASHAR</u>	<u>NRR/DE/EMEB</u>
<u>GEORGE MONAIS</u>	<u>NRR/DE/EEIB</u>
<u>DUC NGUYEN</u>	<u>NRR/DE/EEIB</u>

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SEPTEMBER 11-13, 2003

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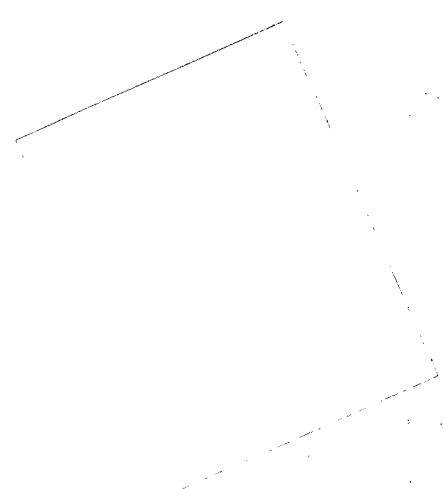
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ITEMS OF INTEREST

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SEPTEMBER 11 -13, 2003

**ITEMS OF INTEREST
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
 505th MEETING
 SEPTEMBER 11-13, 2003**

Page

SPEECHES

- Remarks by Chairman Nils J. Diaz before Florida’s Public Health Workforce on Nuclear and Radiological Events, Tallahassee, Florida, July 8, 2003 1-6
- Remarks by Chairman Nils J. Diaz before the Committee on the Safety Installations/ Committee on Nuclear Regulatory Activities (CSNI/CNRA) at the Joint CSNI/CNRA Workshop on “Redefining the Large Break Loss of Coolant Accident (LOCA) “.... an Idea Whose Time Has Come,” Zurich, Switzerland, June 23, 2003 7-12

OPERATING PLANT ISSUES

- Letter from James E. Dyer, Regional Administrator, /s/ J.L. Caldwell, to Mr. John L. Skolds, President and Chief Nuclear Officer, Exelon Generation Company, LLC. Subject: Notice of Violation - Dresden Nuclear Power Station [NRC Inspection Report 50-237/2002-015 (DRS); 50/249/2002-015 (DRS)] [NRC Office of Investigations Report No. 3-2002-027], August 29, 2003 13-17
- Letter from Hubert J. Miller, Regional Administrator, /s/ J. T. Wiggins, to Mr. L. William Pearce, Site Vice President , FirstEnergy Nuclear Operating Company, Subject: Beaver Valley Power Station - NRC Inspection Report 50-334/03-006, 50-412/03-006 - Final Significance Determination For A White Finding and Notice of Violation, July 10, 2003 18-21
- NRC Press Release from the Office of Public Affairs, Region III, No. III-03-061, “NRC to Begin Special Inspection of Davis-Besse Reactor Test,” dated September 8, 2003 22-23

CONGRESSIONAL CORRESPONDENCE

- Letter from Chairman Nils J. Diaz, to the Honorable George V. Voinovich, Chairman, Subcommittee on Clean Air, Climate Change and Nuclear Safety, Committee on Environment and Public Works, dated August 18, 2003 24-43
- Letter from Chairman Nils J. Diaz, to the Honorable David Price, U.S. House of Representatives, dated August 19, 2003 44-52
- Letter from Chairman Nils J. Diaz, to the Honorable Charles Schumer, U.S. Senate, dated August 7, 2003 53-55

REPORT TO HOMELAND SECURITY

- Letter from Chairman Nils J. Diaz, to the Honorable Tom Ridge, Secretary of Homeland Security, dated August 29, 2003 56-59



NRC NEWS

U. S. NUCLEAR REGULATORY COMMISSION
Office of Public Affairs Telephone 301/415-8200
Washington, DC 20555-0001 E-mail: opa@nrc.gov
Web Site: www.nrc.gov

S-03-020

Remarks of Chairman Nils J. Diaz

before

Florida's Public Health Workforce on Nuclear and Radiological Events

July 8, 2003
Tallahassee, Florida

Good Morning. I do not have slides or a Teleprompter, so bear with me. I do have a message. It is indeed my pleasure to address Florida's public health workforce on nuclear and radiological events. This is a timely program. Indeed, it seems that not a day goes by without someone mentioning the potential harmful effects to persons or property from a nuclear or radiological event. The probability of such an event is low. However, we are prepared for it. The radiological protection of the public health and safety has always been and will continue to be the mission of the Nuclear Regulatory Commission (NRC). I will discuss some of our recent activities and what we are doing in the areas of homeland protection and preparedness, together with our partner Federal agencies, State and local governments, and with our licensees.

The NRC is an independent agency with the Federal mandate to assure protection of the public health and safety, the environment and the common defense and security for civilian uses of nuclear energy and nuclear materials, as established by the Atomic Energy Act (AEA). NRC has the responsibility for licensing and regulating the use of nuclear fuel, radioactive materials and facilities. The NRC continues to have broad domestic authority for ensuring that all safety and security events from such AEA materials are appropriately responded to and dealt with. In short, the NRC's main responsibility has always been, and is, the radiological protection of our people, as well as that of the common defense and security.

We know you are concerned, and so is the NRC with the issues involved in protecting nuclear material and facilities against theft, diversion and sabotage. Let me summarize activities ongoing

at the NRC and in the nation. The infrastructure for homeland security was upgraded soon after 9/11. Many of these activities were coordinated from the Office of the President of the United States. The Department of Homeland Security (DHS) was established on January 24, 2003, with the purpose of streamlining and centralizing federal actions into one cohesive unit. DHS provides one point of contact for State and local groups and the private sector.

In this evolving area of homeland security, NRC understands that it may not always be able to draw a bright line between security responsibilities of NRC-regulated entities and those of defense and law enforcement authorities. Responses may overlap for certain threats when coordination or integration of the responses of the various private and government organizations is required. That is why the NRC, DHS, and other Federal departments and agencies, and the State and local authorities, are working closely together in developing integrated nuclear and radiological security contingency plans to complement licensee capabilities. The NRC believes that this integration is the ultimate responsibility of the Department of Homeland Security, and we are supporting DHS efforts in achieving integration. As we work to resolve the integration issues at the Federal level, we also encourage efforts at the State and local level to develop the specific response protocols that will best serve the nation in enhancing homeland security. I do not want to leave you with the impression that everything is perfect but I want to assure you that, if the need arises, there is but one single-minded goal and action plan: protect our people. There is to be no hesitation, no turf battles, and no limitations, but rather, one cause: protect our people. At the end of the line, health practitioners are key to this goal, if other measures fail to avoid health consequences of an event.

In the aftermath of the September 11 attacks, the NRC undertook a number of measures to improve security at nuclear facilities, including power reactors, fuel facilities, and facilities that possess large radioactive sources, for example, irradiators and facilities that manufacture radiopharmaceuticals for medical use. The NRC has issued over 60 advisories to its licensees to describe changes in the threat environment and provide guidance on ways to enhance security. Also, NRC issued orders requiring certain security enhancements to power plants, decommissioning reactors, fuel cycle facilities, spent fuel facilities, shipments of spent nuclear fuel, and large irradiators.

I believe that it is important to place the health effects of radiation in a proper context. Quite often, this is not the case. I am sure that most of what I point out is known to you, because radiation has been, and is, such a well known and useful tool in the practice of medicine.

Contrary to some public perception, there is strong evidence that ionizing radiation at lower doses is, at most, a relatively weak carcinogen. There would be no x-ray machines or nuclear medicine procedures if this were not a fact. But, let me go to two extreme, well publicized cases. For this purpose, I would exclusively use the most authoritative, peer reviewed data from world recognized organizations.

CASE 1. The atomic bomb explosions at Hiroshima and Nagasaki. Without any doubt, these are the best studied health and epidemiological events in the history of mankind. Among the approximately 86,000 atomic-bomb survivors at Hiroshima and Nagasaki, who have been studied from 1950 to 1990, there has been an excess of 334 deaths from solid cancer (7,578 versus 7,244 expected) and there have been 87 excess deaths from leukemia (249 versus 162 expected).

CASE 2. The disastrous reactor accident and fire at Chernobyl. This is also a well studied health and epidemiological event. In Chernobyl, 31 persons at the reactor site died within a short time of the accident. No one died or was severely injured off-site. But the lessons from Chernobyl, although not yet completed, make a compelling case for emergency preparedness, including related health care, and are useful as a good case for understanding radiological effects. After more than 18 years since the Chernobyl accident, and in following specifically a population of over 300,000 workers with significant radiation exposures, no excess cases of solid cancer or leukemia have been found. I am not saying there are none, I am saying that whatever the number of these cancer types there are, they cannot be distinguished from the number of cancer cases expected to appear in the population. But there are about 1800 children with thyroid cancer that are beyond the norms. This result is as bad as it was avoidable. There is no reason for this to have happened; it is due to a failure of a society to take care of its people that these children are suffering from thyroid cancer. Lack of adequate and timely evacuation, lack of use of KI and lack of restrictions on food contaminated with radioactive iodine are the culprits, all avoidable. Radiation can not be seen, nor can most things that could harm you, but it is easily measured. In fact, the measurability of radiation is so good that we can use its measurement for prevention or mitigation.

When you hear about radiological exposures you tend to think of power reactor releases. However, no member of the US public has been seriously affected by a radioactive release from a reactor. The most serious accident, TMI, resulted in a minor radiological release with the largest dose to a member of the public of less than 90 mrem.

Our largest releases involving over exposures have been in the medical and industrial uses of radioactive material. For example, on June 28, 1995, at the National Institutes of Health in Maryland, a pregnant female unknowingly ingested between 820 and 1300 μCi P-32 from a tampered water cooler resulting in CEDE between 8 and 12.7 rem to herself and between 5.1 and 8.1 rem to the fetus. Twenty-six additional individuals had low levels of internal P-32 contamination. Another event occurred on June 13, 2000, at Southeast Missouri State University where a vial containing 5 mCi of Am-241 broke and contaminated several rooms. Two individuals had intakes. Individual #1 had 20 nCi intake resulting in 15 rem CEDE, and 263 rem CDE to the bone surface. Individual #2 had 9.4 nCi intake resulting in 4.2 rem CEDE, and 76 rem CDE to the bone surface. Every year there are medical misadministration events that result in unintended large radioactive doses to patients. We follow these cases carefully. While few in number, each is carefully reviewed and measures to prevent recurrence are implemented. Every year we have several cases of over exposure, some severe, from industrial sources. Overall,

however, in comparison with most any other industrial or medical activity, these uses have an excellent safety record.

Now I would like to discuss issues related to the protection of radioactive sources. As you can imagine there is a great deal of work and required coordination ahead in the area of protection of radioactive sources. On June 13, 2003, we issued orders to increase security for panoramic and underwater irradiators which are used for sterilization of food and medical supplies. These types of irradiators are authorized to possess greater than 10,000 curies of byproduct material in the form of sealed sources. We recognize that licensees may have already initiated many measures in the order in response to previously issued advisories or on their own.

In addition, the NRC has been working with other Government agencies, its Agreement States, and the IAEA to establish a consistent risk based system for the categorization of radioactive sources that could be used in a radiological dispersal device. The Commission recently approved the initial study of a joint NRC/DOE Working Group which provided action thresholds for radioactive material of the greatest concern. The report also addressed issues such as tracking and control of radioactive sources and recovery of unsecured radioactive material.

The NRC is proceeding in a risk-informed way to complete orders for the other classes of licenses possessing high-risk sources or materials, in particular, licenses with large quantities of cesium-137. To enhance coordination with the States, the NRC is establishing a Materials Security Working Group. This working group will be chartered to develop compensatory measures, coordinate with members of the Organization of Agreement States and the Conference of Radiation Control Program Directors to ensure adequate communication of security topics and issues, and support the training of licensees in the areas of Safeguards Information subject to handling requirements. Security measures will be developed for those licensees based on NRC's common defense and security authority, again using risk and practicality as guidance. NRC will issue compensatory measures directly to approximately 2100 NRC and Agreement State licensees authorized to possess materials that are likely to be used in a radiological dispersal device. These compensatory measures are intended to enhance radioactive source security during their possession and use within the United States, transfer of radioactive material above threshold levels within the United States, and import and export of radioactive material above threshold levels.

The impact of a "dirty bomb" has become a major concern for many. The question is: what can terrorists accomplish in setting off such a weapon? A dirty bomb or a radiological dispersal device (RDD) uses a conventional explosive to disperse radioactive material. It is a fact that the vast majority of sources, if used in a dirty bomb, will not result in a radiological hazard. The primary impact is likely to be societal disruption and economical damage. A "dirty bomb" is not a nuclear bomb and does not produce a nuclear explosion. As is now often quoted, the presumed purpose of its use would be therefore not as a Weapon of Mass Destruction but rather a Weapon of Mass Disruption. It would only become a Weapon of Mass Disruption if we allow it to because of misinformation and/or poor preparation. This is not an acceptable result; there is

much we have to do in the area of information, and again, your know-how becomes indispensable.

I must add that, just because a person is near a radioactive source for a short time or gets a small amount of radioactive dust on himself or herself does not mean he or she will get cancer. The additional risk will likely be very small. However, inhalation or ingestion of radioactive particles needs to be taken very seriously. Doctors will be able to assess the risks and suggest mitigating measures once the radioactive source and exposure level has been determined. Furthermore, treatments today are very effective for boosting the immune system; other important therapeutical processes have also been developed. I know you know, but I have to say that millions of Americans are injected with short-lived radio-isotopes every year.

The use of Potassium Iodide to prevent the uptake of radioactive iodide has been discussed. Its potential use has focused on a radioactive release from a nuclear power plant. It should be noted that Potassium Iodide would not be protective against an RDD except in a very unlikely event. Potassium Iodide only protects the thyroid from radioactive iodine, but offers no protection to other parts of the body or against other radioactive isotopes.

“Prussian Blue” is another drug that should be capable of protecting people against radiation exposure. Prussian Blue has been recommended for years for the treatment of cesium and thallium ingestion. The material, ferric hexacyanoferrate, has been used for years to promote the excretion of cesium and thallium when accidentally ingested, including the much publicized accident in Gioania. I understand that the material is not yet FDA-approved for this use because no one has requested it and there was no viable market until recently. While KI and Prussian Blue are aimed at “blocking” or excreting the radioactive isotope ingested, there is also a growing arsenal of medical treatments for radiological exposures.

Let me go ahead and give you an idea of what is happening currently for nuclear power plants. We have issued several security orders to enhance security at nuclear power plants which include: access authorization controls; fitness for duty; training enhancements; and design basis threat.

In the minds of people there are now two types of events: the accidental events that could occasionally happen in a power plant - an accident like TMI, and accidents that could happen due to a terrorist attack. Although they are definitely different in how they begin, we take a holistic approach to them based on the fact that there should not be much difference in emergency preparedness. Nuclear power plants are designed with defense-in-depth. The NRC believes that rapidly developing accident scenarios in nuclear power plants, whatever the initiator, are covered by the extensive emergency preparedness plans which are in place, and that the significant security improvements, plant mitigation strategies, and emergency plans and off-site communications, are all contributors to robust and enhanced protective measures for the public. Yet, emergency preparedness must cover a spectrum of radiological risks to our nation.

Homeland preparedness is a serious concern for the citizens of the United States; it is an issue to which we are all paying close attention.

In closing, the mission of the NRC is to ensure the protection of the common defense and security, the protection of public health and safety, and the protection of the environment. I firmly believe that this mission is well established and that it is being carried out fully.



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Office of Public Affairs

Telephone 301/415-820

Washington, DC 20555-0001

E-mail: opa@nrc.gov

Web Site: www.nrc.gov

No. S-03-019

REDEFINING THE LARGE BREAK LOSS OF COOLANT ACCIDENT (LOCA)

“ . . . an Idea Whose Time Has Come”

by

Nils J. Diaz, Chairman
U.S. Nuclear Regulatory Commission

Keynote Speech

presented before the Committee on the Safety of Nuclear Installations/Committee
on Nuclear Regulatory Activities (CSNI/CNRA) at the Joint CSNI/CNRA Workshop

Zurich, Switzerland
June 23, 2003

I am very pleased to be here with so many technical experts from around the world to discuss a subject which I feel very strongly about. I would like to express my thanks to the NEA committees, the CNRA and the CSNI, and to our Swiss colleagues for organizing and hosting the meeting, and for the opportunity to share my views with you. And of course, to the NRC staff, and Ashok Thadani in particular, for their work in making this meeting on this subject, possible.

Let me say from the beginning that redefining the Large Break LOCA is for me, and I hope for all of us, a significant safety initiative. I cannot stress that fact enough . . . a safety initiative. We in the US experienced our most serious reactor accident at Three Mile Island (TMI) in 1979 -- twenty-four years ago, yet still fresh in our memories. The TMI accident was not a Large Break LOCA, it was not the event that we had invested so much of our time and technical resources in. The TMI accident was a small LOCA, an event given significantly less attention because of the overwhelming amount of attention on the Large Break LOCA concern. During the four decades since nuclear power plants began operation, each of our nations has experienced important reactor safety events, yet none were Large Break LOCAs. The only power or production reactor accident - Chernobyl - that resulted in loss of life on-site and massive radioactivity releases was many things but not a Large Break LOCA. All the other reactor safety

events include occurrences such as small LOCAs, or loss of decay heat removal or fires or reactivity events. With today's improved know-how, shouldn't we be focused on the right safety issues? Shouldn't we assure the public, whom we are protecting, that our attention and the attention of our licensees is focused on the most important issues and activities for preserving their health and safety? I believe the record shows that we do a good job, but we can do a better job by using what we now know is more safety-focused, cognizant of the past and of present and future needs, and dedicated to the task at hand: protection of public health and safety and the environment.

I believe the nuclear regulatory agencies, cognizant of the present safety experiences and assessment capabilities, need to take the next step. The licensees and reactor vendors cannot change their focus until we change ours. That's a fact. Regulation and technology need to progress in parallel, in phase. And in this particular case, the regulators are currently lagging the technological capabilities. We also need to recognize, consider, and address the technical, legal, and political impediments to change, so whatever we do has to be right, scrutinized and well communicated.

Let me remind you of a quote from the well known 19th century author Victor Hugo, who said,

"Nothing else in the world . . . is so powerful as an idea whose time has come."

Well, I believe that redefining the Large Break LOCA through a risk-informed and performance-based approach, is an idea whose time has come. And I am not overestimating its importance; it plays large in many areas. The double-ended rupture of the largest pipe in the RCS should be moved from the design basis to severe accident management space. This change will not create a void, it will create the opportunity for safety improvements per se, and will establish the due process and requirements to eventually replace design bases with a better, living and dynamic safety basis.

We have a good reason for a change; we need to have the technical basis to support that change. Therefore our first expectation for this meeting should be to identify, clarify, and, if possible, agree upon the current state of knowledge on the probability and consequences of various LOCAs.

As a second expectation, and as I alluded to above, we should also explore a related question (and answer it as best we can); that is, "If we change the Large Break LOCA, what should replace it?"

There is no doubt that, we will need to consider all of the design and operational implications of redefining the Large Break LOCA, and do it better than well. These include issues such as fuel and core design; containment design basis; ECCS design; RCS supports; emergency diesel generator start time; maximum hypothetical accident for dose assessment, emergency preparedness and control room habitability. These sets of issues need to be reduced for holistic system and probabilistic analysis.

Before discussing possible changes to the Large Break LOCA, let me first speak about the current NRC regulations in this area, that is, 10 CFR 50.46 and Appendix K, which establish the requirements for Emergency Core Cooling Systems. I will also mention some of the history of these requirements.

50.46 requires that “. . . ECCS cooling performance must be calculated . . . for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated.” In this context, “loss-of-coolant accidents mean those postulated accidents that result from the loss of reactor coolant at a rate in excess of the capability of the reactor coolant makeup system from breaks in the reactor coolant pressure boundary up to and including a break equivalent in size to the double-ended rupture of the largest pipe of the reactor coolant system.” In Appendix K, “ECCS Evaluation Models,” the word “instantaneous” is added to the phrase “double-ended breaks” making the traditional maximum LOCA (but not necessarily the worst LOCA) the instantaneous double-ended break of the largest pipe in the reactor coolant system (usually the hot and occasionally the cold leg of the RCS).

50.46 analyses are all about consequences. And understanding consequences without understanding the associated probabilities is particularly meaningless for this case. We know that now very well, but the US Atomic Energy Commission (AEC) also knew that back in the 1970's. Qualitative judgements were made about the probability of a LOCA. That's why pipe failures are included in 50.46 but reactor vessel failures are not. The reactor vessel is the largest “pipe” in the RCS, but a judgement was made that vessel failures were so unlikely that protection was not necessary. That was a qualitative judgement about probability.

The approach to classifying events as “anticipated operational occurrences” and “postulated accident,” is more than three decades old. It is a qualitative (or at best semi-quantitative) approach to event probability.

As operating experience and research data become available over time, those qualitative judgements are first validated and later replaced with quantitative information. It is a normal technical progression to go from qualitative judgements to quantitative estimates over time. That's expected progress.

In the December 28, 1973, "Opinion of the Commission," on the rulemaking hearing on 50.46, the Commission stated:

"In adopting this course [the 50.46 rule], we are not blinding ourselves to new knowledge acquired as a result of ongoing research. On the contrary, we believe that it is important that research programs - both analytic and experimental - continue, in order that we may increase knowledge relevant to ECCS performance . . . As new knowledge is acquired, the Commission will analyze it, and at the appropriate time consider the possibility of amending the rule we announce today."

The Commission expected the regulatory requirements to change and progress along with the technology. However, they probably didn't think it would take 30 years!

In developing WASH-1400, the original "Reactor Safety Study," the AEC used the best information at that time to estimate the probability of various LOCA's -- including Large Break LOCAs and even vessel failures -- that was 1974.

Following the TMI accident, the NRC undertook a deep and serious look into its regulations and regulatory practices in the "NRC Special Inquiry" often referred to as the "Rogovin Report." In that report, a number of recommendations call for the increased use of risk analysis and risk insights. These recommendations include the following:

"The best way to improve the existing design review process is by relying in a major way upon quantitative risk analysis" and added,

"What we [the NRC Special Inquiry] are suggesting is that [the existing review process] be augmented and that quantitative methods be used as the best available guide to which accidents are the important ones, and which approaches are the best for reducing their probability and consequences." and again, it included a recommendation,

"We strongly urge that NRC begin the long and perhaps painful process of converting as much as is feasible of the present review process to a more accident-sequence-oriented approach."

I agree with their recommendations and with their predictions that the transition would be "long" and "painful." It should not have been that long and that painful, but it has been. The wheels of "nuclear" progress turn slow because predictability became equated to success. I do not disagree with that; I just disagree with the interpretation of predictability and success. Predictability must be rooted in today's know-how and success (in our case safety success) has to be meaningful for 2003 and beyond.

In 1995, eight years ago, the Commission issued a formal Commission Policy Statement supporting the increased use of PRA. We have made significant progress in the use of PRA since then, but we are far from done. That's our history and we cannot change it. But we have the opportunity to change the future, and I submit to you that we have the obligation to do so.

Now, in 2003, LOCA probabilities are routinely included in Probabilistic Risk Assessments (PRAs or PSAs). They are calculated every day and all around the world and are used in operational safety decisions . . . why not in the basic design requirements too? We have a sound understanding of the probabilities and consequences sufficient to progress to the next rational level of regulation to improve reactor safety.

The changes being considered by the NRC are headed in this direction. The situation is as follows:

The Commission has recently agreed to consider redefining the design basis large-break loss-of-coolant accident (LOCA) in view of the low risk associated with such events. The NRC staff was directed to provide the Commission a comprehensive "LOCA failure analysis and frequency estimation" that is realistically conservative and amenable to decision-making and to consider use of a 10-year period for the estimation of LOCA frequency distributions, with a rigorous re-estimation conducted every 10 years and a review for new types of failures every five years.

In that effort, the staff was directed to use Service-Data, Probabilistic Fracture Mechanics (PFM), and Expert Elicitation in a process that is risk-informed and consistent with the principles of RG 1.174. Where there is convergence, that is success, when there is divergence, there is work to be done.

The staff was also directed to credit leak-before-break where a licensee establishes a reliable and comprehensive means of detecting primary system leaks of the relevant size.

The staff was further directed to establish an appropriate risk "cutoff" for defining the maximum LOCA size and to require strict configuration controls during plant operation and a high quality PRA, including low power and shutdown operations.

These directives from the Commission to the NRC staff, highlight the two key technical issues involved with re-defining the LBLOCA; namely, LOCA frequencies and "PRA Quality". "PRA Quality" means having the appropriate scope level of detail reliability data and realism in accident progression and success criteria to support the regulatory decisions to be made. Since the risk assessment will play a significant role in this important change (i.e., re-defining the LBLOCA), we expect the PRA to be of high quality so that the results are both reliable and convincing. The PRA does not need to be perfect, but it does need to be "good enough". How good is "good enough" is an issue that we face for each risk-informed activity. And, as with previous activities, we will work with experts in the field to develop guidelines on "PRA quality" for this issue, and will probably use a NRC Regulatory Guide. The "PRA quality" issue will be difficult but it is well within our technical capabilities, and will be resolved in a prudent manner.

I am convinced that, as a matter of improving safety, the consideration of very low probability Large Break LOCAs should be addressed as severe accident scenarios, in the severe accident management program, rather than as the design basis accident. Effectively, the current LBLOCA would not be a design basis accident when utilizing a risk-informed approach. With an alternative definition of the LOCA, the really important, risk-significant, accident scenarios would remain within the design basis; in fact, their consideration would be enhanced by a new focus on their risk-importance.

These activities are in the formative stage; the commitment to go forward is fully formed and the NRC staff will develop proposed rule changes and associated guidance for public review and comment over the next several months. In addition, we expect one or more pilot applications which would request risk-informed changes to the Large-Break LOCA requirements through the NRC exemption process. This will provide a way of getting direct and practical experience with

some of the important decisions to be made. We have found this approach very useful in the past.

I have no doubt that some, perhaps many, of the details of the rules and guidance will change, will mature and will become clearer as the staff discusses alternatives with interested parties . . . and that is good. Some new alternative approaches may even be developed. Information from this meeting may also influence the NRC's plans -- and that would be good too.

What I believe will not change is our commitment to improving safety and modernizing the treatment of the Large Break LOCA through the use of the best available information on the likelihood and potential consequences of these events and the best available approaches. And beyond the Large Break LOCA? 10 CFR 50 Appendix A and all it touches.

Realistically: there might be a tendency to let things be; to not challenge the status quo; to think that it is "ok". This would be wrong; technically and for long-term national energy policies.

Remember:

"Nothing else in the world . . . is so powerful as an idea whose time has come"

I look forward to working with you and to your contributions to make it happen.

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[Home](#) > [Electronic Reading Room](#) > [Document Collections](#) > [Enforcement Documents](#) > [Significant Enforcement Actions](#) > [Reactor Licensees](#) > EA-03-102

EA-03-102 - Dresden 2 & 3 (Exelon Generation Co., LLC)

August 29, 2003

EA-03-102

Mr. John L. Skolds, President
and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: NOTICE OF VIOLATION - DRESDEN NUCLEAR POWER STATION [INSPECTION REPORT 50-237/2002-015(DRS); 50-249/2002-015(DRS)] [NRC OFFICE OF INVESTIGATIONS REPORT NO. 3-2002-027]

Dear Mr. Skolds:

This refers to the July 23, 2002, letter from Exelon Generation informing the U.S. Nuclear Regulatory Commission (NRC) that an application, dated March 4, 2002, for renewal of a reactor operator license (NRC Form-398) for the Dresden Nuclear Station, Units 2 and 3, contained incomplete and inaccurate information. This also refers to the NRC biennial baseline inspection of the operator requalification program at the Dresden Station conducted from August 26 through October 4, 2002. The Inspection Report (No. 50-237/02-15(DRS); 50-249/02-15(DRS)) was provided to you on November 1, 2002, and identified an apparent violation of the NRC regulation (10 CFR 50.9) requiring that information submitted to the NRC by a licensee be complete and accurate in all material respects. Additionally, on April 9, 2003, the NRC Office of Investigations (OI) completed an investigation into the circumstances surrounding the apparent violation of 10 CFR 50.9.

In our letter, dated June 3, 2003, we provided you the opportunity to address the apparent violation identified in the inspection report by either attending a predecisional enforcement conference or by providing a written response before we made our final enforcement decision. Enclosed with our June 3, 2003, letter was a copy of the synopsis from the OI report. Information obtained during the course of the OI investigation indicated that the apparent violation was not willful. On July 3, 2003, your staff provided a written response to our letter.

Based on the information developed during the inspection and information provided in the July 3, 2003, letter from Exelon, the NRC has determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. In summary, the NRC Form-398, "Personal Qualification Statement - Licensee," dated March 4, 2002, requested a reactor operator license to be renewed in accordance with 10 CFR 55.55 for Dresden Station, Units 2 and 3. Information on that form indicated the operator passed a comprehensive written examination on November 30, 2001, and the operator met all other requalification requirements. The NRC renewed the license on March 7, 2002, based on the information provided by Exelon on that NRC Form-398. Title 10 Code of Federal Regulations, Section 55.59(a) provides, in part, that an applicant for renewal of a reactor operator license must pass a comprehensive written examination during the continuous requalification period and the continuous period shall not exceed 24 months (730 days).

The requalification period at the Dresden Station began on January 10, 2000, and ended on

January 4, 2002. No comprehensive written examination meeting the requirements of 10 CFR Part 55 was administered at the Dresden Nuclear Station during the requalification period. Your staff administered a comprehensive written examination on November 30, 2001, that most of the staff of the training organization knew did not meet the requirements of 10 CFR Part 55. However, personnel in the training department involved in completing the inaccurate Form-398 were not aware of the 730-day requirement for NRC exams and the operator who signed the form was not aware that the exam did not meet the requirements of 10 CFR Part 55, resulting in the submission of the Form-398 containing inaccurate information.

The failure by Exelon to provide complete and accurate information to the NRC regarding a request to renew a reactor operator license is a significant regulatory issue. The NRC relies upon your staff to provide accurate information in order to make certain licensing decisions. Inaccurate or incomplete information provided to the NRC by your staff impedes the NRC's ability to perform its regulatory function. If the information had been complete and accurate at the time provided, the NRC would have taken a different regulatory position and would not have renewed the license. Therefore, this violation has been categorized in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600 at Severity Level III.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$60,000 is considered for a Severity Level III violation. Because your facility has been the subject of escalated enforcement actions within the last two years,⁽¹⁾ the NRC considered whether credit was warranted for *Identification* and *Corrective Action* in accordance with the civil penalty assessment process in Section VI.C.2 of the Enforcement Policy. Credit was given for the identification of the violation because on July 1, 2002, as a result of a self-assessment performed by the Licensed Operator Requalification Training Organization, your staff discovered that the licensed operators at Dresden Station had not fulfilled their required requalification training, as defined by NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." In addition, on July 11, 2002, your staff contacted the NRC by telephone about the submittal of three reactor operator license renewal requests that were inaccurate because the requests indicated that the operators were current in their requalification status when, in fact, they were not. Two of the license renewal requests were canceled because they had not yet been acted upon by the NRC. However, the third, as discussed above, had already been renewed by the NRC.

Credit was also given for the corrective actions taken. Your staff determined that the root cause for the submittal of inaccurate information to the NRC was due to failure of the staff to adequately maintain the licensed operator requalification program. Corrective actions included: (1) disciplining the individuals involved; (2) briefing all members of the training department on the details of the event; (3) training all licensed operators on requalification requirements and their responsibility to maintain personal cognizance of their requalification dates; (4) revising training procedures to ensure that the definitions of when requalification examinations were required were accurate; (5) creating orientation guides for the training director, operations training manager, lead operator requalification training instructor, operations director, and the shift operations supervisor, which reflect the regulatory requirements of the licensed operator requalification program; and (6) implementing an annual review of licensed operator requalification requirements. Additionally, Exelon removed the operator from licensed duties upon discovery of the violation. The license was correctly renewed and the operator returned to licensed duties on July 25, 2002.

Therefore, to encourage prompt identification and comprehensive correction of violations, I have been authorized, after consultation with the Director, Office of Enforcement, not to propose a civil penalty in this case. However, significant violations in the future could result in a civil penalty.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved, is already adequately addressed in your staff's letter dated July 3, 2003. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from

the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction. The NRC also includes significant enforcement actions on its Web site at www.nrc.gov; select **What We Do, Enforcement**, then **Significant Enforcement Actions**.

Sincerely,

/RA/ James L. Caldwell for

J. E. Dyer
Regional Administrator

Docket Nos. 50-237; 50-249
License Nos. DPR-19; DPR-25

Enclosure: Notice of Violation

cc w/encl:

Site Vice President - Dresden Nuclear Power Station
Dresden Nuclear Power Station Plant Manager
Regulatory Assurance Manager - Dresden
Chief Operating Officer
Senior Vice President - Nuclear Services
Senior Vice President - Mid-West Regional
Operating Group
Vice President - Mid-West Operations Support
Vice President - Licensing and Regulatory Affairs
Director Licensing - Mid-West Regional
Operating Group
Manager Licensing - Dresden and Quad Cities
Senior Counsel, Nuclear, Mid-West Regional
Operating Group
Document Control Desk - Licensing
M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer
Chairman, Illinois Commerce Commission
J. Mikan, Will County Executive/
Board Chairman
P. Kaupas, Will County Sheriff
W. Ferguson, Will County Emergency
Management Director
The Honorable Arthur Schultz
J. Mezera, City Manager
J. Church, Kendall County Board Chairman
R. Randall, Kendall County Sheriff
P. Nelson, Grundy County Board Chairman
J. L. Olson, Grundy County Sheriff
J. Lutz, Grundy County Emergency
Management Coordinator/Director
The Honorable Richard Kopczick
The Honorable C. Richard Ellis
The Honorable Phillip Middleton
The Honorable Joseph Fracaro
The Honorable Elmer Rolando
The Honorable Harvey Taylor
The Honorable Tony McGann
The Honorable Joe Cook
M. T. Gibson, Channahon Village Administrator
The Honorable Richard Chapman
K. Carroll, Shorewood Village Administrator

The Honorable Robert Blum
INPO

NOTICE OF VIOLATION

Exelon Generation Company, LLC
Dresden Nuclear Power Station

Dockets No. 50-237; 50-249
Licenses No. DPR-19; DPR-25
EA-03-102

During an NRC inspection conducted from August 26 to October 4, 2002, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 50.9(a) requires, in part, that information provided to the Commission by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the licensee shall be complete and accurate in all material respects.

10 CFR 55.57(a)(4) requires, in part, that the applicant for the renewal of a reactor operator license provide a statement by an authorized representative of the facility licensee that during the effective term of the current license the applicant has satisfactorily completed the requalification program for which the operator license renewal is sought.

10 CFR 55.59(a) requires, in part, that each licensee shall successfully complete a requalification program developed by the facility licensee that has been approved by the Commission. This program shall be conducted for a continuous period not to exceed 24 months in duration and each licensee must pass a comprehensive written examination.

Contrary to the above, Exelon Generation Company, LLC, provided an NRC Form-398, "Personal Qualification Statement - Licensee," to the NRC that was not complete and accurate in all material respects. Specifically, information provided by authorized representatives of the Exelon Generation Company's Dresden Nuclear Station on the NRC Form-398, dated March 4, 2002, indicated that on November 30, 2001, the applicant for renewal of a reactor operator license passed a comprehensive written examination for the continuous period of requalification from January 10, 2000, to January 4, 2002. However, the written examination completed by the applicant did not meet and was not intended by the exam developer to meet the requirements of 10 CFR Part 55. As a result, the applicant did not complete a comprehensive written exam for the continuous period of requalification indicated on the Form-398. The information concerning the comprehensive written examination is material to the NRC because the NRC relies on it to determine whether the applicant meets the requirements to operate the controls of a nuclear power plant pursuant to 10 CFR Part 55.
(VIO 50-237/02-15-05; 50-249/02-15-05)

This is a Severity Level III violation. (Supplement VII)

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved, is already adequately addressed on the docket in Inspection Report No. 50-237/2002-015(DRS); 50-249/2002-015(DRS) and in a letter from the licensee, dated July 3, 2003. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation, EA-03-102" and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region III, Suite 255, 801 Warrenville Road, Lisle, IL 60532-4351, and a copy to the NRC Resident Inspector at the Dresden facility, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 29th day of August 2003.

1. A Severity Level III violation was issued on June 23, 2003, (EA-02-265) and a \$60,000 Civil Penalty was proposed for a failure to provide complete and accurate information on September 27, 2001, regarding a water hammer involving Dresden Station Unit 3 high pressure coolant injection system.

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Last revised Tuesday, September 09, 2003

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Reactors](#)[Nuclear
Materials](#)[Radioactive
Waste](#)[Facility Info
Finder](#)[Public
Involvement](#)[Electronic
Reading Room](#)

[Home](#) > [Electronic Reading Room](#) > [Document Collections](#) > [Enforcement Documents](#) > [Significant Enforcement Actions](#) > [Reactor Licensees](#) > EA-03-054

EA-03-054 - Beaver Valley 1 & 2 (FirstEnergy Nuclear Operating Co.)

July 10, 2003

EA-03-054

Mr. L. William Pearce
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Post Office Box 4
Shippingport, Pennsylvania 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INSPECTION REPORT 50-334/03-006,
50-412/03-006 - FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING
AND NOTICE OF VIOLATION

Dear Mr. Pearce:

The purpose of this letter is to provide you with the final results of our significance determination of the preliminary white finding identified in the subject inspection report dated April 30, 2003. This inspection finding was assessed using the significance determination process and was preliminarily characterized as white, i.e., a finding with low to moderate safety significance, which may require additional NRC inspections. This finding involved the ability of your emergency response organization to meet Emergency Preparedness Plan (EPP) staffing requirements during emergencies. Specifically, on January 31, 2003, during an unannounced activation drill, only one of twelve radiation protection (RP) positions that were required to be staffed, was staffed within the time required by Table 5.1 of your EPP (either 30 or 60 minutes depending on the position). This issue was white because you failed to meet a planning standard, in this case 10 CFR 50.47(b)(2), by not ensuring that adequate and timely emergency response staffing was maintained at all times and timely augmentation of response capabilities was available. The NRC also considered this issue to be an apparent violation of 10 CFR 50.47(b)(2).

In a telephone conversation with Mr. Richard Crlenjak of NRC, Region I, on May 15, 2003, Mr. Brian Sepelak of your staff indicated that FirstEnergy Nuclear Operating Company (FENOC) had declined an opportunity to discuss this finding in a Regulatory Conference, but would be providing a written response supporting a green finding.

In your response dated May 30, 2003, you contend that the planning standard set forth in 10 CFR 50.47(b)(2) was met, noting that it does not explicitly specify a time to complete staff augmentation. You also contend that the NRC, in a 1985 Safety Evaluation Report (NUREG-1057) for the Beaver Valley Power Station, approved 120 minutes as an acceptable augmentation time for staffing these twelve RP positions. You stated that the January 31, 2003, unannounced activation drill demonstrated that all twelve RP positions were staffed within 120 minutes. You agreed that Table 5.1 of your EPP was not met during the January 31, 2003, drill because you were not able to staff all 12 RP positions within the respective 30 minute and 60 minute requirements set forth therein. However, you maintain that the planning standard was met because these positions were staffed within 120 minutes, which you contend was previously approved in the 1985 SER.

Notwithstanding your contention, although the NRC agrees that 10 CFR 50.47(b)(2) does not

explicitly specify a time to complete staff augmentation, your site specific EPP is based on the accepted industry standard for meeting staff augmentation times contained in NUREG-0654, Table B-1, which is 30 and 60 minutes. While the 1985 SER had some discussion of this issue, you revised Table 5.1 of your EPP in 1995 to require 30 and 60 minute staff augmentation times for these twelve RP positions. Therefore the NRC maintains that the failure to meet those accepted standards represents a failure to meet the planning standard set forth in 10 CFR 50.47(b)(2).

You also contend that two actual events classified at the Alert level, during which RP technicians were required to respond, did not result in any deficiencies or problems in staff augmentation. The NRC maintains that one of these events occurred during normal business hours when appropriate personnel needed to augment these twelve RP positions were already on site. The other event occurred during the evening, but you did not have any documentation to indicate the 12 RP positions were properly augmented in the required 30 or 60 minutes.

You also contend that your onsite staff is capable of temporarily addressing any required short-term actions if the augmentation of RP technicians was delayed for up to 120 minutes. However, the NRC maintains, as stated in the subject inspection report, that: (1) assigning multiple functions to individuals likely would be burdensome in a number of cases; (2) some of the responders who would be assigned in an impromptu manner to perform RP functions are not presently in EPP-required positions, and therefore, may not be available in all situations; and (3) although many of your staff are "meter qualified" to perform basic RP duties, this level of training would not be sufficient to carry out the complex RP duties that would be necessary in a radiological emergency.

Based on the information developed during the inspection, and the NRC staff's evaluation of the information provided in your response dated May 30, 2003, the NRC has concluded that the inspection finding is appropriately characterized as white. You have 10 business days from the date of this letter to appeal the staff's determination of significance for the identified white finding. Such appeals will be considered to have merit only if they meet the criteria given in NRC Inspection Manual Chapter 0609, Attachment 2.

In addition, the white finding was associated with a violation of 10 CFR 50.47(b)(2) for not ensuring that adequate and timely emergency response staffing was maintained at all times. The violation is cited in the enclosed Notice of Violation; the circumstances surrounding the violation were described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, NUREG-1600, this Notice of Violation is considered escalated enforcement action because it is associated with a white finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved is already adequately addressed on the docket as summarized in the subject inspection report dated April 30, 2003, and in your response letter dated May 30, 2003. Immediate corrective action consisted of identifying supervisory personnel with RP expertise, who already carried pagers, to fill these 12 RP positions until RP technicians could respond to the site. In addition, pagers, cell phones and training were provided to a pool of RP technicians who will now fulfill the augmented RP positions. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

Because plant performance for this finding has been determined to be in the regulatory response band, we will use the NRC Action Matrix to determine the most appropriate NRC response for this event. We will notify you by separate correspondence of that determination.

In your response, you also contend that this finding is a licensee-identified deficiency because it was first identified by FENOC during an activation drill on January 31, 2003, and was entered into your corrective action program. You implied that this issue should have been discussed in the "Licensee Identified Violations" section of the NRC inspection report. The NRC agrees that this issue was licensee-identified. However, as defined by Manual Chapter 0612, only findings of green significance in a licensee's corrective action program qualify to be discussed in the "Licensee Identified Violations" section of an inspection report.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its

enclosure, and your response will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

If you have any questions please contact Mr. Richard Conte of my staff at 610-337-5183.

Sincerely,

/RA/ James T. Wiggins Acting For

Hubert J. Miller
Regional Administrator

Docket Nos: 50-334, 50-412
License Nos: DPR-66, NPF-73

Enclosure: Notice of Violation

cc w/encl:

J. Lash, Plant General Manager
V. Kaminskis, Director, Nuclear Maintenance
R. Mende, Director, Nuclear Work Management
M. Pearson, Director, Services and Projects
T. Cosgrove, Director, Nuclear Engineering/Projects
L. Freeland, Manager, Nuclear Regulatory Affairs & Corrective Actions
M. Clancy, Mayor, Shippingport, PA
R. Janati, Chief, Division of Nuclear Safety
Commonwealth of Pennsylvania
State of Ohio
State of West Virginia

NOTICE OF VIOLATION

FirstEnergy Nuclear Operating Company
Beaver Valley Power Station

Docket Nos: 50-334, 50-412
License Nos: DPR-66, NPF-73
EA-03-054

During an NRC inspection conducted between February 24 - 28, March 14 - 26, and April 17 - 29, 2003, the results of which were discussed at exit meetings on February 28, March 26 and April 30, 2003, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 50.47(b)(2), states, in part, that adequate staffing to provide initial facility accident response in key functional areas is maintained at all times and timely augmentation of response capabilities is available.

10 CFR 50.54(q) requires that the facility licensee shall follow and maintain in effect Emergency Plans which meet the standards in 10 CFR 50.47(b).

The Emergency Preparedness Plan, Table 5.1, requires that during an emergency, six radiation protection technicians respond to the site within 30 minutes, and six radiation protection technicians respond to the site within 60 minutes, to augment the on-site Emergency Response Organization to cover four radiation protection functions, namely offsite surveys, onsite surveys, in-plant surveys, and in-plant protective actions.

Contrary to the above, from 1995 until February 28, 2003, the on-site Emergency Response Organization could not be augmented by radiation protection technicians within the required times to cover four radiation protection functions. This was demonstrated during an unannounced activation drill on January 31, 2003, when 11 of

12 radiation protection technicians were unable to respond within the times as required by the Emergency Preparedness Plan.

This violation is associated with a White Significance Determination Process finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved is already adequately addressed on the docket in Inspection Report 50-334/03-006; 50-412/03-006, and your response letter dated May 30, 2003. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation; EA-03-054," and send it to the U.S. Nuclear Regulatory Commission, ATTENTION: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region I, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 10th day of July 2003

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Last revised Tuesday, September 09, 2003

21

[Index](#) | [Site Map](#) | [FAQ](#) | [Help](#) | [Glossary](#) | [Contact Us](#)

[Advanced](#)
[Search](#)


U.S. Nuclear Regulatory Commission

[Home](#)
[Who We Are](#)
[What We Do](#)
[Nuclear Reactors](#)
[Nuclear Materials](#)
[Radioactive Waste](#)
[Facility Info Finder](#)
[Public Involvement](#)
[Electronic Reading Room](#)

[Home](#) > [Electronic Reading Room](#) > [Document Collections](#) > [News Releases](#) > [2003](#) > [III-03-061](#)



NRC NEWS U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs, Region III
801 Warrenville Road, Lisle IL 60532
www.nrc.gov

No. III-03-061

CONTACT: Jan Strasma (630) 829-9663
Viktoria Mitlyng (630) 829-9662

September 8, 2003

E-mail:
opa3@nrc.gov

NRC TO BEGIN SPECIAL INSPECTION OF DAVIS-BESSE REACTOR TEST

The Nuclear Regulatory Commission will conduct a special inspection at the Davis-Besse Nuclear Power Plant to monitor a seven-day test of the plant's reactor cooling system. The plant, operated by FirstEnergy Nuclear Operating Company, is near Oak Harbor, Ohio.

The reactor will not be started up for the test. Heat generated by the cooling system pumps will be sufficient to raise the pressure in the reactor and associated piping to approximately 2155 pounds per square inch (psi) -- the normal operating pressure -- and approximately 530 degrees Fahrenheit, which is near the normal operating temperature.

Davis-Besse has been shut down since February of last year. After the shutdown, workers found a corrosion-caused cavity in the reactor vessel head, and the plant has remained shut down for repairs, inspections, and modifications. The plant may not resume operations without NRC authorization.

Normally a nuclear plant is required to conduct a 4-to-6 hour test of the reactor cooling system following an outage, but FirstEnergy plans a seven-day test to provide added assurance that the reactor cooling system is leaktight.

FirstEnergy will also use the test to assess its position that there is no leakage from the bottom of the reactor vessel. There are 52 tubes which pass through the bottom wall of the reactor vessel to carry reactor monitoring instrumentation. During an inspection of the reactor bottom last year, FirstEnergy identified chemical staining on the surface of the reactor vessel around the tubes.

The utility determined that the source of the staining was leakage from the refueling area during refueling or runoff from cleaning activities for the reactor vessel head. An earlier test at a lower reactor pressure (250 psi) showed no evidence of leakage from the bottom of the reactor vessel.

The NRC inspection team will independently review the utility's conduct of the test and the data collected, and evaluate the test results. In addition, the NRC resident inspectors assigned to the plant and a plant operations specialist from the Region III office will monitor the performance of the utility's operations staff during the test.

On September 5 the NRC staff issued a license amendment to FirstEnergy to permit the temperature and pressure conditions, known as "Mode 4 - hot shutdown" and "Mode 3 - hot standby," necessary to perform the test without correcting a potential problem with two high pressure emergency pumps. The utility previously found that the pumps might malfunction under certain conditions during a reactor accident.

The NRC review of the license amendment found the utility can safely bring the plant to the

temperature and pressure conditions needed for the test. Since the reactor will not be started up for the test and since it has not operated for 18 months, the NRC review found that the pumps would not be exposed to the potential accident conditions that might cause a malfunction.

After the test is completed, FirstEnergy plans to modify the pumps to eliminate the potential problem. The pump problem must be resolved before the plant is permitted to resume operations.

The NRC inspection team will issue a report about 30 days after the completion of the inspection. The report will be available on the NRC's Davis-Besse web site under "News and Correspondence." The NRC's license amendment and the safety evaluation supporting the amendment will also be available on the web site.

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Last revised Monday, September 08, 2003

August 18, 2003

The Honorable George V. Voinovich, Chairman
Subcommittee on Clean Air, Climate Change
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

The Fiscal Year (FY) 2003 Energy and Water Development Appropriations Act, House Reports 107-681 and 108-10, directed the Nuclear Regulatory Commission (NRC) to continue to provide a monthly report on the status of its licensing and regulatory duties and expanded the scope of the report to include information on the status of the Davis-Besse Nuclear Power Station. The initial reporting requirement arose in the FY 1999 Energy and Water Development Appropriations Act, Senate Report 105-206. On behalf of the Commission, I am pleased to transmit the fifty-fifth report, which covers the month of June 2003. I am also providing more recent information in this cover letter in order to keep you fully and currently informed of NRC's licensing and regulatory activities.

The previous report provided information on a number of significant activities, including the establishment of a new position – the Deputy Executive Director for Homeland Protection and Preparedness – to increase the agency's attention to cross-cutting issues that affect security, incident response, emergency preparedness, and external integration of comprehensive strategies for these areas. The Commission also approved a license amendment to allow Nuclear Fuel Services (NFS), Incorporated, to possess and use special nuclear material at the newly constructed uranyl nitrate building on its Erwin, Tennessee, complex. Additionally, the NRC issued an Order to confirm that NFS will implement security enhancements, which are similar to those ordered by the Commission earlier this year for other fuel cycle facilities.

I would like to provide you with an update on the status of the leakage identified in the bottom of the reactor vessel at the South Texas Project (STP) nuclear power plant, Unit 1, located near Bay City, Texas. As we previously reported, the NRC dispatched a special inspection team on May 5, 2003, to review the circumstances of the discovery, the licensee's root cause analysis, and the adequacy of the licensee's repairs. Since our last report, the Special Inspection team has completed its work and held a public meeting in Bay City on July 28 on the team's findings. NRC staff concluded that the repair was acceptable. The root cause of the leakage is still under investigation. Following a review of the licensee's activities, which includes a commitment to implement a continued monitoring program, the NRC concluded that STP officials have taken all the actions necessary to ensure a safe restart of Unit 1.

Since our last report, the Commission has approved an agreement with the State of Wisconsin by which Wisconsin assumes part of the NRC's regulatory authority over certain radioactive materials in the State pursuant to Section 274 of the Atomic Energy Act. With the approval, Wisconsin becomes the 33rd State to enter into such an agreement with the NRC. The agreement became effective on August 11, 2003.

Recently, the Commission and the NRC staff also:

- published in the Federal Register on August 7, 2003 (68 FR 46929), a final rule that amends NRC regulations to increase the maximum secondary retrospective deferred premium for liability insurance coverage in the event of nuclear incidents at licensed, operating, commercial nuclear power plants with a rated capacity of 100,000 kW or more. Currently established at \$83.9 million per reactor per incident (but not to exceed \$10 million in any one year), the maximum secondary retrospective deferred premium is being increased to \$95.8 million per reactor per incident (but not to exceed \$10 million in any one year). The change is based on the aggregate percentage change of 14.2 percent in the Consumer Price Index (CPI) from December 1997 through March 2003. The Price-Anderson Amendments Act of 1988 requires that this inflation adjustment be made at least once each five years.
- published in the Federal Register on August 1, 2003 (68 FR 45172), notice of a proposed amendment to NRC regulations governing the use of byproduct material in specifically licensed portable gauges. The proposed rule would require a portable gauge licensee to provide a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever the portable gauges are not under the control and constant surveillance of the licensee.
- completed the NRC staff review of the potential clogging of the containment sump at the Davis-Besse Nuclear Power Station and made the preliminary determination that it was a "yellow" finding, one of substantial importance to safety. The plant, operated by FirstEnergy Nuclear Operating Company at Oak Harbor, Ohio, has been shut down since February of last year. To correct the potential problem, FirstEnergy has installed a redesigned sump screen, providing substantially larger surface area; recoated surfaces in the containment with approved coatings; and removed other sources of debris.
- issued on July 29, 2003, a Regulatory Issue Summary (RIS) that summarizes the results of NRC staff's review of the responses to Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." This RIS also provides information on additional regulatory actions the NRC is considering based on its review of the bulletin responses and recent events at South Texas Unit 1.
- published in the Federal Register on July 29, 2003 (68 FR 44550), a notice of availability for public inspection and comment for the License Termination Plan (LTP) for the Big Rock Point Nuclear Facility (BRP) located in Charlevoix, Michigan. Reactor operations at the BRP ended on August 29, 1997. The reactor was defueled, and all fuel was moved to an independent spent fuel storage installation in March 2003. The NRC also conducted a public meeting in Charlevoix on August 5, 2003, to discuss the BRP LTP.
- received the results of the Federal Emergency Management Agency's most recent review of the adequacy of off-site emergency preparedness plans and procedures for the Indian Point nuclear power facility. The Federal Emergency Management Agency concluded that measures to protect the health and safety of surrounding communities can be taken and are capable of being implemented in the event of a radiological incident at the Indian Point facility. The NRC determined, based on its continuing evaluation of the licensee's on-site emergency planning and preparedness for radiological events, that Indian Point meets the requisite criteria for reasonable assurance of adequate protection.

- published in the Federal Register on July 22, 2003 (68 FR 43400), a notice of availability of a draft report describing state-of-the-art methods for performing fire dynamics calculations at nuclear power plants. The report, "Fire Dynamics Tools (FDTs) - Quantitative Fire Hazard Analysis Methods for the U.S. Nuclear Regulatory Commission Fire Protection Inspection Program (Draft NUREG-1805)," will help agency inspectors perform quick, first-order calculations for potential fire scenarios using principles of fire dynamics.
- issued on July 21, 2003, Supplement 1 to NRC Information Notice 2002-26, "Additional Failure of Steam Dryer After a Recent Power Uprate," to alert nuclear power plant operators of another failure of the steam dryer at Quad Cities Nuclear Power Station, Unit 2, a boiling water reactor, during operations following a power uprate. It is expected that the recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems.
- issued the final plan NRC will use to review an expected application from the Department of Energy (DOE) to construct a high-level nuclear waste geologic repository at Yucca Mountain, Nevada. The principal purpose of the Yucca Mountain Review Plan is to ensure the quality and uniformity of the NRC staff's reviews. A copy is available on the NRC website at: <http://www.nrc.gov>
- held four public meetings concerning an update of NRC's 1996 Generic Environmental Impact Statement (GEIS) for license renewal of nuclear power plants. The meetings were held throughout the country to solicit comments from the public on the update.
- met with the Department of Energy representatives on July 15 and 16, 2003, to discuss the status of the program at the Yucca Mountain and the Yucca Mountain Project Quality Assurance Program.
- issued a Fact Sheet on NRC Force-on-Force exercises that are being held as part of the comprehensive security program at commercial nuclear power plants across the country to assess and improve, as necessary, licensee security strategies. The fact sheet is available on the NRC's website at:
<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/force-on-force.html>.
- approved a direct final rule that amends 10 CFR 72.214, "List of approved spent fuel storage casks," revising the NAC International, Inc., Multipurpose Canister cask system listing with the "List of approved spent fuel storage casks." This amendment incorporates changes to support the Yankee Nuclear Power Station (Yankee Rowe) fuel loading effort and makes corrections to the Connecticut Yankee technical specifications.
- issued, on June 24, 2003, a RIS entitled, "Clarification of NRC Guidance for Modifying Protective Actions." Protective actions are developed and implemented through an emergency plan designed to minimize exposure to the public in the event of a radiological emergency. This RIS clarified the regulatory requirements associated with updating protective action recommendations.

- issued, on June 13, 2003, a RIS to clarify the NRC staff's expectations regarding the frequency of licensed operator comprehensive requalification written examinations required by Part 55 of Title 10 of the Code of Federal Regulations (10 CFR Part 55).

Please do not hesitate to contact me if I may provide additional information.

Sincerely,

/RA/

Nils J. Diaz

Enclosure:
Monthly Report

cc: Senator Thomas R. Carper

LIST OF ADDRESSEES

The Honorable George V. Voinovich, Chairman
Subcommittee on Clean Air, Climate Change,
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator Thomas R. Carper

The Honorable Joe Barton, Chairman
Subcommittee on Energy and Air Quality
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Rick Boucher

The Honorable Pete V. Domenici, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510
cc: Senator Harry Reid

The Honorable David L. Hobson, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States House of Representatives
Washington, D.C. 20515
cc: Representative Peter Visclosky

The Honorable James M. Inhofe, Chairman
Committee on Environmental and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator James Jeffords

The Honorable W.J. "Billy" Tauzin, Chairman
Committee on Energy and Commerce
United States Representatives
Washington D.C. 20515
cc: Representative John D. Dingell

MONTHLY STATUS REPORT ON THE
LICENSING ACTIVITIES AND REGULATORY DUTIES OF THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

JUNE 2003

ENCLOSURE

TABLE OF CONTENTS¹

I. Implementing Risk-Informed Regulations 2

II. Revised Reactor Oversight Process 2

III. Status of Issues in the Reactor Generic Issue Program 2

IV. Licensing Actions and Other Licensing Tasks 2

V. Status of License Renewal Activities 8

VI. Status of Review of Private Fuel Storage, Limited Liability Corporation's Application for a License to Operate an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians 9

VII. Enforcement Process and Summary of Reactor Enforcement by Region 10

VIII. Power Reactor Security Regulations 12

IX. Power Uprates 12

X. Status of the Davis-Besse Nuclear Power Station 13

¹Note: The period of performance covered by this report includes activities occurring between the first and last day of June 2003. The transmittal letter to Congress accompanying this report may provide more recent information in order to keep Congress fully and currently informed of NRC's licensing and regulatory activities.

I Implementing Risk-Informed Regulations

Although the staff continues to make progress on tasks involving use of probabilistic risk information in many areas, there were no significant milestones accomplished during the month of June 2003.

II Reactor Oversight Process

The NRC continues to implement the Reactor Oversight Process (ROP) at all nuclear power plants. The NRC continues to meet with interested stakeholders on a periodic basis to collect feedback on the efficacy of the process and considers stakeholder feedback in making refinements to the ROP. Recent activities include the following:

On June 18, 2003, an ROP public meeting was held at the NRC Headquarters offices. Meeting participants discussed Degraded Cornerstone and Action Matrix ROP policy issues, proposed changes to the Significance Determination Process (SDP) manual chapter appendices, and Frequently Asked Questions (FAQs) on the performance indicators (PIs). Status updates on draft SDPs included containment, shutdown, steam generator tube integrity, fire protection, maintenance rule, and spent fuel SDPs. Two significant issues were discussed -- the scrams with loss of normal heat removal (LONHR) PI and the Alert and Notification System Reliability Emergency Preparedness PI. For the scrams w/LONHR PI, the ROP Working Group decided to study the feasibility of using a modified approach. The Working Group will perform preliminary analysis to understand the practical ramifications for using this change to the current PI and further discussions will be conducted during the next ROP public meeting. Participants also discussed the Emergency Preparedness Alert and Notification System Reliability PI guidance and the related FAQ. After much discussion, the Working Group decided to resolve the FAQ in concert with the resolution of the generic issue of Alert and Notification System testing and reporting data.

III Status of Issues in the Reactor Generic Issue Program

Resolution of the issues in the Reactor Generic Issue Program continues to be on track in accordance with the schedules previously submitted.

IV. Licensing Actions and Other Licensing Tasks

Licensing actions are defined as requests for license amendments, exemptions from regulations, relief from inspection or surveillance requirements, topical reports submitted on a plant-specific basis, notices of enforcement discretion, or other licensee requests requiring NRC review and approval before it can be implemented by the licensee. The FY 2003 NRC Performance Plan incorporates three output measures related to licensing actions -- number of licensing action completions per year, age of the licensing action inventory, and size of licensing action inventory.

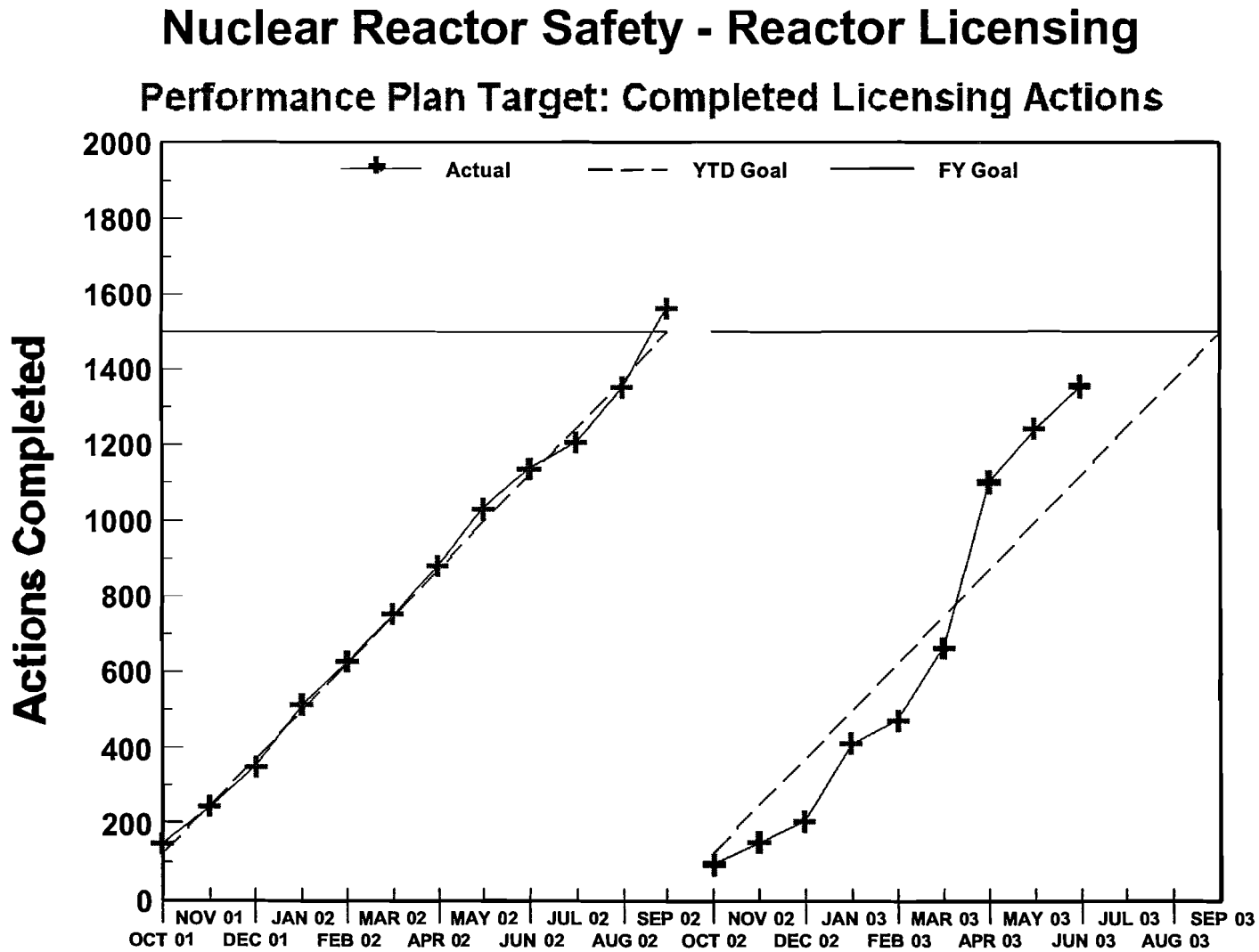
Other licensing tasks are defined as licensee responses to NRC requests for information through generic letters or bulletins, NRC responses to 2.206 petitions, NRC review of licensee topical reports, NRR responses to regional requests for assistance, NRC review of licensee 10 CFR 50.59 analyses and FSAR updates, or other licensee requests not requiring NRC review and approval before it can be implemented by the licensee. The FY 2003 NRC Performance Plan incorporates

one output measure related to other licensing tasks -- number of other licensing tasks completed.

The actual FY 2001 and FY 2002 results, the FY 2003 goals, and the actual FY 2003 results, as of June 30, 2003, for the four NRC Performance Plan output measures for licensing actions and other licensing tasks are shown below:

PERFORMANCE PLAN				
Output Measure	FY 2001 Actual	FY 2002 Actual	FY 2003 Goals	FY 2003 Actual (thru 06/30/2003)
Licensing actions completed/year	1617	1560	≥ 1500	1355
Age of licensing action inventory	96.9% ≤ 1 year; and 100% ≤ 2 years	96.6% ≤ 1 year; and 100% ≤ 2 years	96% ≤ 1 year and 100% ≤ 2 years old	93% ≤ 1 year; 100% ≤ 2 years
Size of licensing action inventory	877	765	≤ 1000	1362
Other licensing tasks completed/year	523	426	≥ 350	392

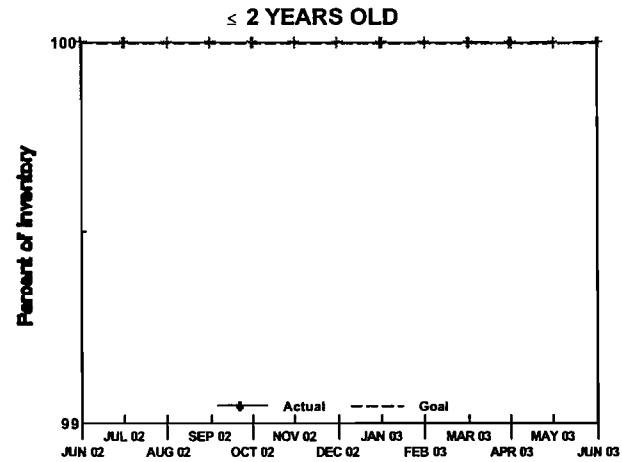
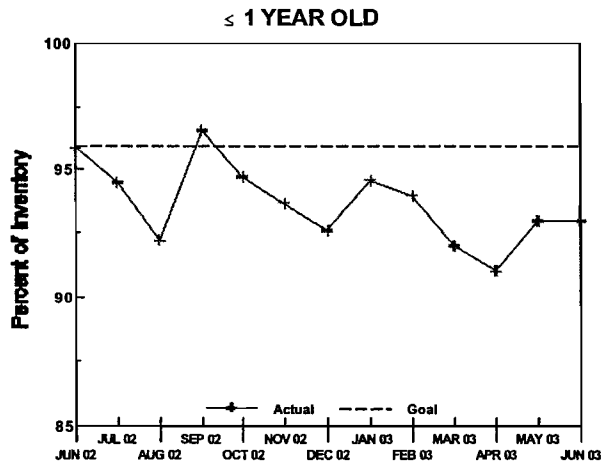
The following charts demonstrate NRC's FY 2003 trends for the four licensing action and other licensing task output measure goals:



33

Nuclear Reactor Safety - Reactor Licensing

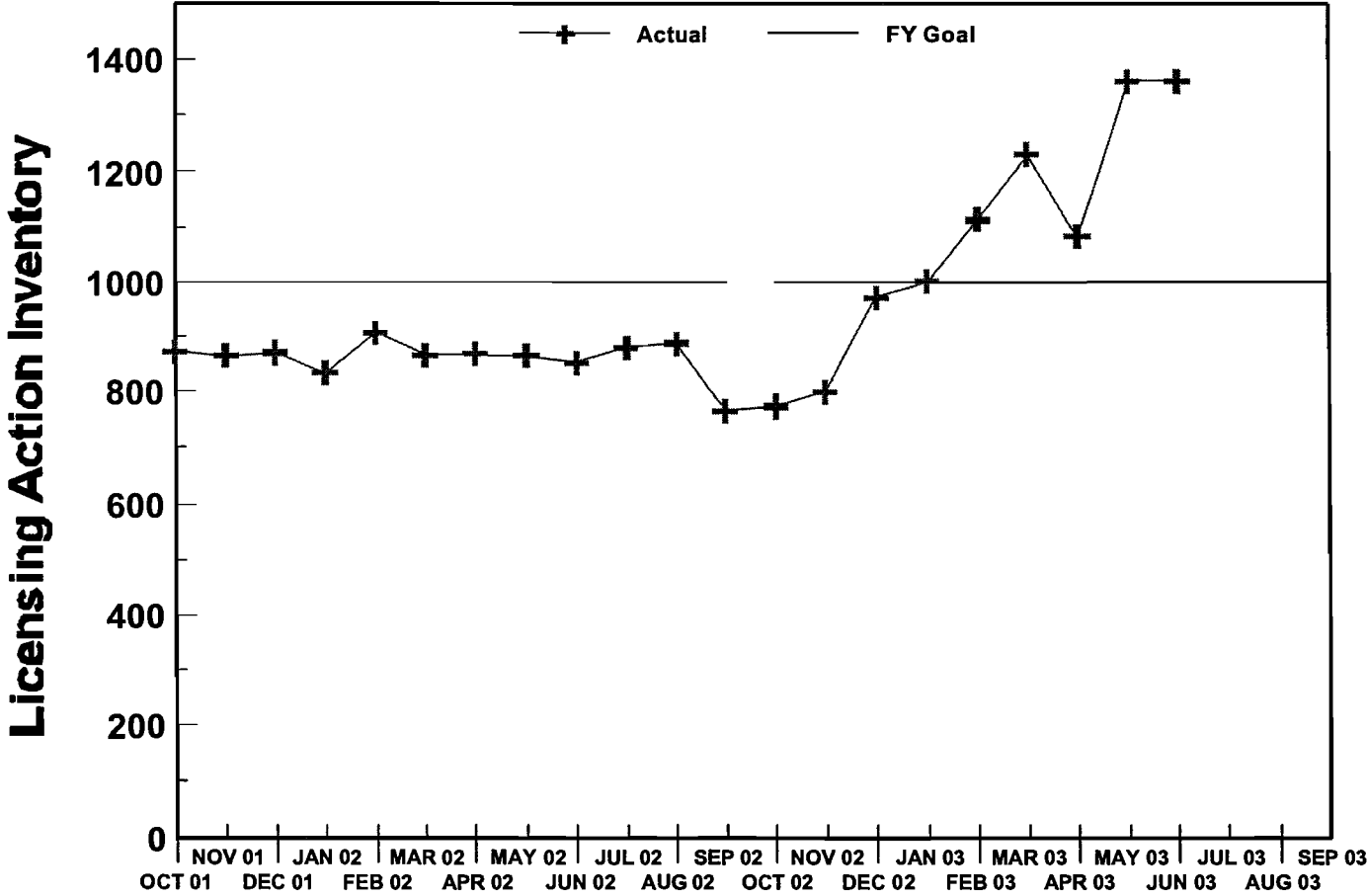
Performance Plan Target: Age of Licensing Action Inventory



34

Nuclear Reactor Safety - Reactor Licensing

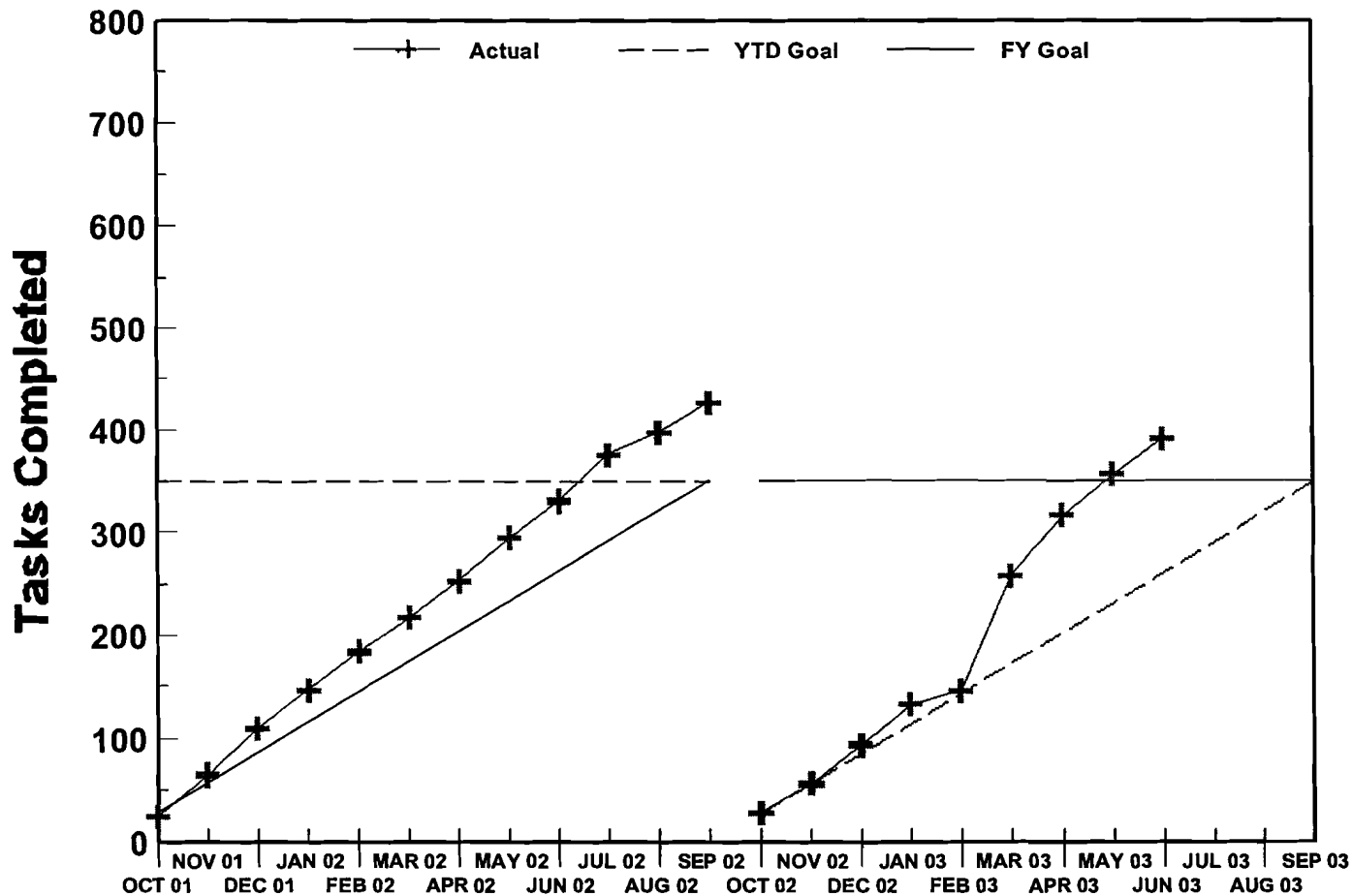
Performance Plan: Size of Licensing Action Inventory



35

Nuclear Reactor Safety - Reactor Licensing

Performance Plan Target: Completed Other Licensing Tasks



V Status of License Renewal Activities

McGuire, Units 1 and 2, and Catawba, Units 1 and 2, Combined Renewal Applications

The staff issued the final supplemental environmental impact statements (SEISs) for McGuire and Catawba in December 2002. The safety evaluation report resolving the open items was issued in January 2003. A decision on the renewal of the licenses is scheduled for December 2003.

In January 2002, the Atomic Safety and Licensing Board (ASLB) admitted contentions filed by two petitioners in the Catawba and McGuire license renewal proceeding. The staff and Duke appealed the ASLB decision, and the contentions were subsequently dismissed. However, in December 2002, the Commission reinstated late-filed contentions that had been submitted in May 2002. In April 2003, the petitioners requested that one of the dismissed contentions be reinstated. These late-filed contentions and the request for reinstatement are currently being reviewed by the ASLB for admissibility.

St. Lucie, Units 1 and 2, Renewal Application

The staff issued the final SEIS in May 2003. The staff issued the safety evaluation report identifying open items in February 2003, and the applicant provided responses to the open items in March 2003. The staff is reviewing the applicant's responses and preparing to issue the safety evaluation report in July 2003.

Fort Calhoun Renewal Application

The staff issued the draft SEIS for public comment in January 2003. The public comment period ended in April 2003. The staff is addressing the comments received and is preparing the final SEIS, which is scheduled to be issued by August 2003. The staff issued the safety evaluation report identifying the remaining open items in April 2003, and the applicant's responses are due in July 2003.

Robinson Unit 2 Renewal Application

The staff issued the draft SEIS for comment in May 2003. The public comment period ends in July 2003. The safety requests for additional information were issued in February 2003, and the applicant's responses were received in April 2003. The staff is reviewing the applicant's responses and preparing to issue the safety evaluation report, which will identify any remaining open items, by August 2003.

Ginna Renewal Application

Environmental requests for additional information were issued in January 2003, and the applicant's responses were received in March 2003. The staff reviewed the responses and issued the draft SEIS in June 2003. The safety requests for additional information were issued in March 2003, and the applicant's responses were received in June 2003. The staff is reviewing the applicant's responses and preparing to issue the safety evaluation report, which will identify any remaining open items, by October 2003.

Summer Renewal Application

Environmental requests for additional information were issued in January 2003, and the responses were received in March 2003. The staff is reviewing the responses and is preparing the draft SEIS, which is scheduled to be issued in July 2003. The safety requests for additional information were issued in March 2003, and the applicant's responses were received in June 2003. The staff is reviewing the applicant's responses and preparing to issue the safety evaluation report, which will identify any remaining open items, by October 2003.

Dresden, Units 2 and 3, and Quad Cities, Units 1 and 2, Combined Renewal Applications

The application is currently under review by the staff. Environmental requests for additional information were issued in May 2003, and the responses are due in July 2003. The safety requests are scheduled to be issued by August 2003.

VI Status of Review of Private Fuel Storage, Limited Liability Corporation's Application for a License to Operate an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians

Litigation continues on the application by Private Fuel Storage, L.L.C. (PFS) for a license to construct and operate an independent spent fuel storage installation (ISFSI) on the Reservation of the Skull Valley Band of Goshute Indians in Skull Valley, Utah. On May 28, 2003, NRC issued an order holding in abeyance petitions by the NRC staff and PFS seeking Commission review of the Atomic Safety and Licensing Board's (ASLB) Partial Initial Decision (Regarding "Credible Accidents") (LBP-03-04). In that decision, the ASLB determined that the probability of an F-16 aircraft crash on the proposed PFS Facility is in excess of the Commission's threshold annual probability of occurrence, and allowed PFS to submit a consequence analysis to demonstrate that such an accident would not harm public health and safety. The Commission deferred action on the NRC staff and PFS petitions for review of that decision pending the completion of litigation on PFS's consequence analysis and directed the ASLB to "proceed expeditiously on the consequence aspect of the air crash issue, with a view toward resolving it no later than the end of 2003." A tentative litigation schedule has been adopted by the ASLB in accordance with the Commission's directive.

As discussed in the May report, three other matters remain in litigation. First, on May 22, 2003, the Licensing Board issued its decision on seismic and geotechnical issues, resolving all such matters in favor of PFS; the State of Utah has filed a petition seeking Commission review of that decision, which is now pending before the Commission. Second, on May 27, 2003, the Licensing Board issued three decisions resolving all financial assurance and decommissioning funding issues in favor of PFS; PFS then filed a motion before the ASLB seeking reconsideration of certain portions of those decisions, and the State of Utah requested and was granted an extension of time to file a petition seeking Commission review of the decisions until a ruling is issued on PFS's motion for reconsideration. Third, the ASLB is preparing a decision on litigated environmental issues concerning PFS's plan to build a rail line to its facility; that decision is expected shortly.

On June 16, 2003, the NRC staff held a public meeting with representatives of PFS to discuss PFS's planned submittal of its aircraft crash consequence analysis and issues associated with the proper classification of information to be submitted with regard to the consequence analysis.

VII Enforcement Process and Summary of Reactor Enforcement by Region

Reactor Enforcement by Region

Reactor Enforcement Actions*						
		Region I	Region II	Region III	Region IV	TOTAL
Severity Level I	June 2003	0	0	0	0	0
	FY 03 YTD	0	0	0	0	0
	FY 02 Total	0	0	0	0	0
	FY 01 Total	0	0	0	0	0
Severity Level II	June 2003	0	0	0	0	0
	FY 03 YTD	0	0	0	0	0
	FY 02 Total	1	0	0	0	1
	FY 01 Total	0	1	0	0	1
Severity Level III	June 2003	1	0	1	0	2
	FY 03 YTD	2	0	3	0	5
	FY 02 Total	2	0	0	0	2
	FY 01 Total	1	1	1	1	4
Severity Level IV	June 2003	0	0	0	0	0
	FY 03 YTD	1	0	2**	1	4
	FY 02 Total	0	0	2	0	2
	FY 01 Total	1	0	2	1	4
Non-Cited Severity Level IV	June 2003	2	0	4	2	8
	FY 03 YTD	163	126**	146	130	556
	FY 02 Total	207	89	201	151	648
	FY 01 Total	279	105	201	139	724

* Numbers of violations are based on enforcement action tracking system (EATS) data that may be subject to minor changes following verification. The number of Severity Level I, II, III listed refers to the number of Severity Level I, II, III violations or problems. The monthly totals generally lag by 30 days due to inspection report and enforcement development.

** These numbers were corrected to account for violations from previous months that had not been counted.

Escalated Reactor Enforcement Actions Associated with the Reactor Oversight Process						
		Region I	Region II	Region III	Region IV	Total
NOVs*** Related to White, Yellow or Red Findings	6/03 Red	0	0	0	0	0
	6/03 Yellow	0	0	0	0	0
	6/03 White	0	0	1	1	2
	FY 03 YTD	5	1	7	1	14
	FY 02 Total	5	4	6	8	22
	FY 01 Total	8	4	4	3	19

***Notice of Violations

Description of Significant Actions taken in June 2003

Exelon Generation Company, LLC (Dresden 3) EA-02-265

On June 23, 2003, a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of \$60,000 was issued for the willful failure to provide complete and accurate information to the NRC Region III staff during a telephone conference call on September 27, 2001, concerning the high pressure coolant injection (HPCI) system.

Exelon Generation Company, LLC (Dresden 3) EA-02-264

On June 23, 2003, a Notice of Violation was issued for a violation associated with a White SDP finding involving the operability of the high pressure coolant injection (HPCI) system. The violation cited the licensee's failure to correct promptly a damaged HPCI system support resulting in the equipment being inoperable for greater than the allowed outage time.

Union Electric Company (Callaway) EA-03-060

On June 20, 2003, a Notice of Violation was issued for a violation associated with a White SDP finding involving the licensee's emergency planning. The violation cited the failure to establish the means to notify certain members of the public in the emergency planning zone in the event of an emergency at the Callaway plant.

Florida Power & Light Company (Turkey Point) EA-00-230

On June 5, 2003, a Notice of Violation was issued for a Severity Level III violation for discriminating against an employee at the Turkey Point Nuclear Plant for engaging in protected activity.

40

VIII Power Reactor Security Regulations

In response to the terrorist attacks on September 11, 2001, the NRC and the nuclear industry have taken a number of actions to ensure the security at nuclear power plants. A series of Advisories, Orders, and Regulatory Issue Summaries have been issued to strengthen further the security of NRC-licensed facilities and control of nuclear materials.

The most recent Orders enhancing security at nuclear power reactors were issued on April 29, 2003. The Orders revised the threat against which individual power reactor licensees and category 1 fuel cycle facilities must be able to defend, limited the number of hours that security personnel can work, and enhanced training and qualification requirements for security personnel. These orders accomplish the mission by providing reasonable assurance that the effects of fatigue will not impact the security personnel at nuclear power plants, that training programs will enhance the readiness of armed security personnel at nuclear power plants, and that licensee security and safeguards programs will be evaluated against a more realistic design basis threat (nuclear power plants and category 1 fuel cycle facilities). The details of the individual Orders regarding threat are safeguards information pursuant to Section 147 of the Atomic Energy Act and will not be released to the public. Extensive deliberation and interaction with stakeholders preceded issuance of the Orders.

In March 2003, the NRC initiated a pilot program for full force-on-force exercises, which use expanded adversary characteristics that were developed as a result of the increased post 9/11 threat. As of the end of June, force-on-force exercises have been completed at five plants. The NRC plans to conduct force-on-force tests at a rate of approximately two per month. The exercises will be carried out at each nuclear power plant on a three-year cycle instead of the eight-year cycle that had been used prior to September 11, 2001.

Two force-on-force exercises will be conducted at nuclear power plants during the month of July 2003. NRC staff expect considerable stakeholder (public, utilities, and State and local governments) interest in these exercises. The dates of these exercises have not been publicly announced.

IX Power Upgrades

The staff has assigned power uprate license amendment reviews a high priority and therefore is conducting power uprate reviews on accelerated schedules.

Licensees have been applying for and implementing power uprates since the 1970s as a way to increase the power output of their plants. The staff has been conducting power uprate reviews since then and, to date, has completed 95 such reviews. Approximately 12,197 MWt (4065 MWe) or an equivalent of over three nuclear power plant units has been gained through implementation of power uprates at existing plants. During the month of June, the staff received one measurement uncertainty recapture power uprate for Palisades. The staff currently has 6 plant-specific applications under review.

In January 2003, the staff completed a survey of nuclear power plant licensees to obtain information regarding industry's plans related to power uprate applications. Based on this survey and information obtained since the survey, licensees plan to submit 33 additional power

uprate applications in the next 5 years. These include 12 measurement uncertainty recapture power uprates, 3 stretch power uprates (i.e., power uprates up to about 7 percent), and 18 extended power uprates. Planned power uprates are expected to result in an increase of about 6675 MWt (2225 MWe). The staff will utilize this information for future planning.

On June 11, 2003, NRC staff made a presentation to the Vermont State Nuclear Advisory Panel (VSNAP) regarding the process that the NRC uses for reviewing extended power uprates. VSNAP is a seven-member panel that meets periodically and considers issues relating to present and future use of nuclear power in general and of the Vermont Yankee Nuclear Power Station in particular. The panel advises the Governor of Vermont, the General Assembly, and State agencies. VSNAP is considering an extended power uprate for the Vermont Yankee plant and requested the June 11 briefing to gain a better understanding of the extent of safety review that the NRC conducts for these uprates. The meeting was well attended by members of the public. This meeting provided an opportunity for the NRC to explain the regulatory processes to the public and the level of regulatory oversight that the NRC has in place for ensuring public health and safety. Conducting meetings like this is important for meeting the agency's goal of increasing public confidence.

X Status of Davis-Besse Nuclear Power Station

During the month of June, NRC continued its inspections evaluating issues on the NRC Oversight Panel's Restart Checklist. As of June 30, 2003, FirstEnergy Nuclear Operating Company (FENOC) projects an August 2003 startup of the Davis-Besse plant. The plant completed fuel load on February 26, 2003, and entered Cold Shutdown (average coolant temperature less than 200 degrees Fahrenheit) on March 12, 2003. The plant successfully completed its integrated containment leak rate test on April 9, 2003, demonstrating that containment vessel and building restoration was adequate following the new reactor head installation. The containment vessel and building were cut open and then subsequently restored to facilitate bringing in the new vessel head and removing the old one.

In June, the Oversight Panel completed its review and determined that FENOC adequately resolved two additional items on the Restart Checklist -- Adequacy of Root Cause Determinations for Organizational, Programmatic and Human Performance Issues and Adequacy of Organizational Effectiveness and Human Performance Corrective Action Plan. As a result, the NRC has now closed 13 of the 29 items on the Restart Checklist.

On June 3, 2003, the Oversight Panel conducted two public meetings in Port Clinton, Ohio. Participants at the first meeting included licensee representatives who discussed plant performance and progress on their Return to Service Plan. At the second meeting, the Oversight Panel discussed the status of the NRC activities and responded to questions and concerns from the public.

On June 6, 2003, the NRC issued a proposed Director's Decision to a 10 CFR 2.206 petition request from Representative Dennis Kucinich. That Petition was submitted on February 3, 2003 and supplemented on March 27, 2003.

In June, the NRC issued two Inspection Reports (IR). These include the routine resident inspector report (IR 50-346/03-13) and a special inspection of the Emergency Core Cooling System and Containment Spray System Sump (IR 50-346/03-06).

On June 19, 2003, the Oversight Panel conducted a public meeting to discuss the licensee's proposed modification to the High Pressure Injection Pumps. These 2 pumps are an important part of the plant emergency core cooling systems. Considerable engineering effort remains on this problem resolution and this work has the potential to affect the restart schedule.

Detailed information on NRC activities associated with the Davis-Besse reactor vessel head degradation event can be found at:
<http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation.html>.

August 19, 2003

The Honorable David Price
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Price:

On behalf of the Commission, I am responding to your letter of March 5, 2003, regarding the vulnerability of nuclear power plants and spent fuel pools against a possible terrorist attack. Your letter refers to a study that appeared in Volume 11, Number 1, of *Science and Global Security*, a Princeton University publication, which concludes that spent fuel pools are vulnerable to terrorist attacks that could result in significant offsite consequences.

The study advocates transferring all spent fuel from wet to dry storage five years after discharge at an estimated cost of \$3.5-7 billion dollars. The study references a number of NRC staff reports (e.g., NUREG-1738). However, we believe that the study misinterprets and misapplies the NRC staff reports. A copy of a more detailed NRC review of the study that appeared in the *Science and Global Security* is enclosed for your information.

Nuclear power reactor spent fuel pools are robust structures constructed of very thick concrete walls with stainless steel liners. In addition, other design characteristics of these pools make them highly resistant to damage. For example, many plants have the fuel in the pool partially or completely below grade and the pool shielded by other plant structures. Spent fuel pools at operating power reactors are also protected by approved licensee security plans, which have been further augmented as a result of NRC's Orders of February 25, 2002, and April 29, 2003. In the unlikely event that a spent fuel pool was successfully attacked and the water either partially or completely drained, there still would be several hours for recovery of fuel cooling. Prior to September 11, 2001, licensees already had a robust security program and well-armed and trained security force to defend the plant from terrorist attack. The NRC Orders supplemented those capabilities through requirements for increased patrols, augmented security forces, additional security posts, greater vehicle stand-off distances, and enhanced coordination with law enforcement authorities. These orders also directed licensees to develop guidance and strategies to maintain or restore spent fuel pool cooling capabilities using existing or available resources.

The National Research Council, in its 2002 report, *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*, noted that "[t]he threat of terrorist attacks on spent fuel storage facilities, like reactors, is highly dependent on design characteristics. Moreover, spent fuel generates significantly less heat than an operating reactor, so that emergency cooling of the fuel in the case of an attack could probably be accomplished using 'low tech' measures that could be implemented without significant exposure of workers to radiation." The Commission agrees with this statement and has, through its Order of February 25, 2002, required that licensees prepare such measures in advance.

The Honorable David Price

- 2 -

In summary, NRC does not believe that the fundamental recommendation of the study that all spent fuel more than five years old be placed in dry casks through a crash 10-year program costing many billions of dollars is justified.

Your letter also expresses appreciation for former Chairman Meserve's letter of September 5, 2002, which outlines steps taken by the NRC to evaluate and enhance security at NRC-licensed facilities since September 11, 2001. You asked that we continue to provide information to Congress and the public on NRC actions to improve security. We agree and plan to do so. As you are aware, former Chairman Meserve sent a letter to members of Congress, heads of other Federal agencies, Governors, and other dignitaries on March 31, 2003, detailing NRC accomplishments in safeguards and security since his letter of September 5, 2002, on the same subject. I intend to send a similar letter updating our actions since March 31, 2003, in the near future.

I want to assure you that the NRC is committed to a strong and independent oversight program to ensure safety, security, and emergency preparedness at all NRC-regulated facilities.

Sincerely,

IRA

Nils J. Diaz

Enclosure:
NRC Review of Alvarez Report,
"Reducing the Hazards from Stored Spent
Power-Reactor Fuel in the United States"

Nuclear Regulatory Commission (NRC) Review of "Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States"¹

Introduction

The NRC staff has reviewed the paper, "Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States," April 21, 2003, Robert Alvarez, et al., (published in *Science and Global Security*, spring 2003) and concludes that it fails to make the case for its central recommendation.

The basic argument of the paper is that the risks and potential societal costs of terrorist attacks on power reactor spent fuel pools justify complex and costly measures to improve the safety of fuel storage. The main recommendation made in the paper is the removal of all spent fuel cooled more than five years from the storage pools, storage of that fuel in dry storage casks, and modifying spent fuel pools to open-frame storage for the remaining fuel at an estimated cost of \$3.5 to \$7.0 billion. The benefits attributed to this proposal are that the amount of spent fuel stored in the pools would be substantially reduced (by approximately a factor of four) and the remaining fuel could, with open-frame storage, be rendered coolable even if the pool water were entirely lost. Additional measures to improve fuel cooling and reduce the risk of a severe spent fuel pool accident are also discussed.

The paper suffers from excessive conservatism throughout its cost benefit evaluation. Therefore, the recommendation for an accelerated program of complex and costly measures does not have a sound technical basis. In the United States, spent fuel, in both wet and dry configurations, is safe and measures are in place to adequately protect the public.

Analysis

Our review of the paper indicates that it is a deficient study of the hazards associated with the storage of spent fuel. Many of the 114 cited references are NRC studies or NRC contracted studies conducted for a variety of purposes, and most are not applicable to terrorist attacks. Some of the studies are generically applicable, others are plant specific, and all of the studies are based on assumptions that do not appear to have been sufficiently considered by the authors. For example, the authors' analysis of societal costs is based on a 1997 Brookhaven National Laboratory study which was performed for a reactor site location that represents an extremely high surrounding population density and is not representative of an industry average. However, the authors suggest that it is a characteristic site appropriate for broadly assessing industry costs and benefits. In another example, the author's quote a cesium-137 release fraction from an NRC publication. However, the value chosen in the NRC publication was acknowledged to be a bounding assumption that was not based on analysis. Valid scientific

¹ "Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States," Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, and Frank N. Von Hippel, April 21, 2003. (Published in *Science and Global Security*, spring 2003)

studies carefully search past data and analyses, carefully evaluate them and then draw conclusions based on the facts, augmenting the data or analyses when necessary.

Anecdotal information is sprinkled throughout the study. However, in many cases insufficient or no context is provided. For example, a means cited in the paper for removing water from the pool is to boil the water as a result of a jet fuel fire. The paper acknowledges that in the event of a jet fuel fire, only a relatively small fraction of the heat would go into the pool. Yet the paper states that burning 30 cubic meters of kerosene would release enough heat to evaporate 500 tons of water. This corresponds to the theoretical 100% absorption of the released energy to evaporate the mass of water and is a vast misrepresentation of expected physical behavior. Even after making this inappropriate assumption, the authors fail to note that for a typical pool the loss of 500 tons of water corresponds to only a modest drop in water level such that the fuel is still safely covered by an ample inventory of water. Mentioning a potential hazard, in this case which assumed evaporating spent fuel pool water with jet fuel, without explaining the expected consequences (in this case no consequences) is misleading.

Additionally, the report does not attempt to compare the risks associated with spent fuel storage with the risks associated with other critical civilian infrastructure, e.g., storage of hazardous materials. Without putting the risks associated with spent fuel storage in context with other risks, it makes little sense to do cost-benefit analysis and propose solutions.

The NRC staff has reviewed the paper and have concluded that it suffers from significant flaws. We have identified four major areas where the authors have, based on their own analysis or referenced findings of earlier studies, introduced unrealistic conservatism into their risk assessment and cost-benefit evaluation—1) no justification for the postulated probabilities of worst-case spent fuel pool damage; 2) overestimation of radiation release ; 3) overestimation of consequences and societal costs for the postulated severe event; and 4) underestimation of the costs of the authors' main recommendation. Each area is discussed below.

No Justification for Postulated Probabilities of Worst-Case Spent Fuel Pool Damage

The paper does not offer a probabilistic analysis of the likelihood of a terrorist attack leading to severe damage of a spent fuel pool and its fuel. Indeed, the paper quotes the NRC staff comment that "No established method exists for quantitatively estimating the likelihood of a sabotage event at a nuclear facility." (Terrorist and sabotage events are addressed by the NRC's regulatory requirements without quantitative estimation of the likelihood.) Instead, the paper simply states probabilities of success for an attack leading to worst-case fuel damage which the authors claim would justify, on a cost-benefit basis, removing older fuel from pools, storing it in dry casks, and storing remaining fuel in an open-rack configuration. The authors deduce that if there is a .7 percent chance in a 30-year period of a terrorist attack leading to a complete release of a spent fuel pool's cesium-137 inventory or an approximately 5 percent chance in a 30-year period of a terrorist attack leading to the release of one tenth of a spent fuel pool's cesium-137 inventory, then the authors' estimated \$3.5 to \$7 billion cost of relocating the older spent fuel into casks would be justified, but they do not provide any basis for these probabilities.

The authors suggest by their discussion of various threats to a spent fuel pool that the cited likelihoods of an attack leading to worst-case fuel damage are reasonable. Specifically, in discussing a potential terrorist attack using a large aircraft, the paper cites past NRC studies which assumed a high conditional probability that the turbine shaft of a large plane would penetrate and drain the spent fuel pool, if the aircraft struck the pool. A second reference to simplified models for penetration of a reinforced concrete wall is cited as support for the view that penetration "cannot be ruled out."

The past NRC reports referenced, NUREG/CR-5042, "Evaluation of External Hazards to Nuclear Power Plants in the United States," and NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," used very conservative assumptions with respect to the conditional probability of pool penetration by the turbine shaft of a large plane in part because even with those conservative assumptions the risk was acceptably low for the intended purpose, and more detailed analyses were not needed at the time. However, when assessing potential spent fuel pool vulnerabilities to terrorist events, using these very large conservatisms is inappropriate and provides misleading results.

Since the attacks of September 11, 2001, the NRC has sponsored additional research regarding the penetrability of concrete structures by aircraft engine turbine shafts. The analyses have been performed using both detailed physical response modeling and experimentally validated models developed by Sandia National Laboratories and the U.S. Army Corps of Engineers. These models have been specifically developed to assess penetration of materials by hard projectiles under a variety of size, speed, and orientation conditions. While the analyses are ongoing and specific results are classified, the results strongly indicate that prior assumptions regarding the probability of engine turbine shaft penetration are conservative by orders of magnitude. These latest improved calculations retain significant, yet realistic, conservatism. For example, the analyses do not generally consider the beneficial effects of the steel liner on the inside of the pool or the effect of the pool water itself in reinforcing the concrete wall. The effect of these conservatisms is to further support the conclusion that prior assumptions related to engine turbine shaft penetration of the pool wall are overly conservative for a realistic assessment. Therefore, analyses which rely on these assumptions, as does the subject study, as underpinning for judging the conditional probability of pool failure due to a terrorist attack using a large aircraft, are not reflecting the actual structural capabilities of power reactor spent fuel pools.

The authors hint at various other ways that terrorists might attack a spent fuel pool to justify their postulated probabilities of a terrorist-induced spent fuel pool drain-down event (.7 percent to 5 percent over a 30 year period). However, in doing so the paper does not adequately credit either the physical features of the pools or the security, unmatched elsewhere in our nation's critical civilian infrastructure, surrounding such spent fuel pools. Nuclear power reactor spent fuel pools are neither easily reached nor easily breached. Instead, they are strong structures constructed of very thick steel-reinforced concrete walls with stainless steel liners. In addition, other design characteristics of these pools, not analyzed in the paper, can make them highly resistant to damage and can ease the ability to cope with any damage. Such characteristics can include having the fuel in the pool partially or completely below grade and having the pool shielded by other plant structures.

The likelihood of a terrorist attack cannot be ascertained with confidence by state-of-the-art methodology and any attempt at quantification or even qualitative assessment of the likelihood of terrorist attack is highly speculative.² Nonetheless, spent fuel pools at operating power reactors are protected by robust licensee security measures, which have been further augmented as a result of NRC's February 25, 2002 and April 29, 2003 Orders, the details of which are sensitive. Even prior to September 11, 2001, licensees had multiple barriers and sensors, well-armed and trained guards, ready to defend from prepared positions. The February 25, 2002 and April 29, 2003 Orders augmented those capabilities through requirements for increased patrols, augmented security forces, additional security posts, greater vehicle stand-off distances, more frequent training, preparation to defend against a larger design basis threat, and enhanced coordination with law enforcement authorities. In short, the Commission believes that the combination of the physical features and security of spent fuel pools make them highly resistant to terrorist attacks.

Overestimation of Radiation Release

In estimating fuel damage, the paper again makes reference to past NRC studies which conservatively assumed bounding pool configurations for cooling analysis and conservatively assumed the extent of radiation release. In the 1997 Brookhaven National Laboratory (BNL) study, "Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82," (NUREG/CR-4982), it was assumed that 10-100% of the cesium-137 was released to the atmosphere. Similarly in NUREG-1738 the base case assumed the release of 75% of the total cesium-137 inventory. The assumption of such a large release in NUREG-1738 was a large conservatism which was tolerable for the purposes of that study. However, it is neither a realistic estimate nor an appropriate assumption for a risk assessment of security issues where realism is needed. Ongoing research to address these issues includes more detailed realistic analyses of the thermal response of fuel to loss of water scenarios and more detailed, realistic analyses of the radionuclide releases for those scenarios where adequate cooling is not maintained. Based on preliminary analyses, we conclude that spent fuel in pools is more easily cooled even in the event of a complete loss of water. Further, preliminary analysis indicates that previous NRC estimates of the quantities of fission products released were high by likely an order of magnitude. Earlier NRC studies used large conservatisms, in generic calculations, with simplified modeling.

Further, the paper generally does not give credit for the likely intervention by operators to prevent uncovering the fuel or to provide emergency cooling to the spent fuel although it acknowledges some of the very long times available for loss of cooling events. Our ongoing analyses suggest that longer times than previously estimated are available for operators to intervene to restore water to ensure that the fuel remains cooled.

The National Research Council in its 2002 report, Making the Nation Safer: The Role of Science and Technology in Countering Terrorism, found: "The threat of terrorist attacks on spent fuel

² Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 350 (2002).

storage facilities, like reactors, is highly dependent on design characteristics. Moreover, spent fuel generates orders of magnitude less heat than an operating reactor, so that emergency cooling of the fuel in the case of an attack could probably be accomplished using 'low tech' measures that could be implemented without significant exposure of workers to radiation." The Commission agrees with this statement, and through its February 25, 2002 Order directed licensees to develop guidance and strategies to maintain or restore spent fuel pool cooling capabilities using existing or available resources.

Overestimation of Consequences and Societal Costs For Postulated Severe Event

The authors' analysis of land contamination for a postulated severe fuel damage event reflects a range of cesium-137 releases of 3.5-35 megaCuries, but the estimate of costs cited in the paper is taken from the 1997 BNL study which assumed a release of cesium-137 from 8-80 megaCuries. The BNL study was performed for a reactor site location that represents an extremely high surrounding population density and that is not representative of an industry average. However, the authors suggest that it is a characteristic site appropriate for broadly assessing the risk of their postulated severe event. The use of the BNL study's site characteristics, instead of a mean value considering all sites, biases the economic impacts and societal costs of the postulated worst-case fuel damage event by a factor of 5 - 10. Moreover, if a site-specific evaluation were performed, it would be necessary to address site-specific features which mitigate against pool damage and any large release, including location of the pool or fuel below grade and shielding of the pool by surrounding structures. When such mitigative site-specific features are taken into account, mean economic impacts and societal costs of the postulated severe fuel damage event would be further reduced.

Underestimation of Cost of Main Recommendation

The paper estimates the cost for removing the older fuel from pools and placing it in casks to be \$3.5-7 billion. We have preliminarily concluded that the authors' estimate is low by at least a factor of two when considering the costs of spent fuel pool modifications, dry storage facility design and construction, dry storage cask procurement, and cask loading and transfer costs. Furthermore, the paper does not address the radiation doses to workers that would result from the removal, disposal, and replacement of the spent fuel pool racks nor the added risk from these manipulations.

Spent Fuel Pool Safety Facts

To reiterate before closing, the safety and security of spent fuel pools is ensured by a series of physical structures, operational measures and security barriers that are unprecedented in U.S. civilian infrastructure.

- Nuclear power reactor spent fuel pools are robust structures constructed of very thick steel-reinforced concrete walls with stainless steel liners located inside protected areas.

- Many of spent fuel pools are designed with the pool and fuel located below grade, many are shielded by other structures, and many have intervening walls that would obstruct an aircraft's or other object's impact.
- Spent fuel pools contain enormous quantities of water and the spent fuel in the spent fuel pool produces significantly less heat than in an operating reactor. As a result, for most events (i.e., loss of cooling or small leaks) plant operators would have significant amounts of time to correct the problem, or implement fixes needed to restore cooling.
- In addition to the water in the spent fuel pool, nuclear power plants possess many other sources of water that are readily available that could be made available as a backup supply to the spent fuel pool.
- Since September 11, 2001, additional measures have been taken to reduce the likelihood of a terrorist attack and to further improve capabilities of nuclear plants to resist and withstand an attack. These measures include specific enhancements associated with the protective strategies for ground attacks on spent fuel pools. Additionally the NRC has ordered licensee to develop guidance and strategies to maintain and restore spent fuel pool cooling using existing or available resources if cooling is lost for any reason.
- Access to spent fuel pools requires passage through multiple physical barriers which must be of sufficient strength to provide high assurance in the protection of public health and safety from radiological sabotage. An attempt to commit radiological sabotage at a spent fuel pool would result in a security response to neutralize the threat. Furthermore, the Federal government has taken numerous actions to prevent terrorist use of large aircraft over the past 18 months, thereby reducing the likelihood of an attack on all critical infrastructure from such threats.
- Currently analyses are underway utilizing updated realistically conservative methods. Insights from these more realistic analyses indicate that
 - the spent fuel stored in spent fuel pools is more easily cooled than predicted in earlier NRC studies,
 - the consequences of such an accident would be much less severe than previously estimated,
 - the radioactive release would be much smaller (by at least a factor of 10 for the scenarios analyzed), and the radioactive release would begin later than previously estimated
 - providing more time for implementing effective protective measures, e.g., evacuation of the EPZ,
 - resulting in reduced health effects, and

- resulting in reduced land contamination.

Conclusion

In summary, we conclude that the authors' assessment of possible spent fuel pool accidents stemming from potential terrorist attacks does not address such events in a realistic manner. In many cases, the authors rely on studies that made overly conservative assumptions or were based on simplified and very conservative models. The use of these previous studies, most of them NRC or NRC contractor studies, provides overly conservative and misleading results when assessing potential spent fuel pool vulnerabilities to terrorist events. The overall effect of the combined conservatisms in the four major areas discussed cumulatively affect the paper's cost-benefit calculations for its central recommendation by orders of magnitude. Given all of this, NRC does not believe that the fundamental recommendation of this paper, namely that all spent fuel more than five years old be placed in dry casks through a crash 10-year program costing many billions of dollars, is at all justified. Spent fuel stored, in both wet and dry storage configurations, is safe and measures are in place to adequately protect the public.

August 7, 2003

The Honorable Charles Schumer
United States Senate
Washington, D.C. 20510

Dear Senator Schumer:

I recently returned from a two-day visit to the Indian Point Energy Center in New York and, in light of your interest, wanted to share with you my observations on the current status of safety, security and emergency preparedness at the site. First and foremost, let me assure you that the Commission takes its public health and safety responsibility very seriously and that we remain focused on providing a strong and independent oversight program at Indian Point.

The primary purpose of my visit was to observe first hand the force-on-force site exercise. This force-on-force exercise is part of a pilot program that NRC is conducting at over a dozen sites. During my site visit, I also had the opportunity to tour the plants, the Emergency Offsite Facility and much of the nearby surrounding area. Mr. Hubert Miller, the NRC Region I Regional Administrator, who is responsible for the NRC staff that monitors and inspects Indian Point, accompanied me throughout my visit. We reviewed many of the safety and security enhancements made to the plant and its programs since September 11, 2001. The range of enhancements reflects the NRC's "defense-in-depth" safety philosophy, in which requirements for plant safety features and mitigation strategies, security measures, and emergency preparedness are addressed in an integrated manner. Our observations and ongoing oversight support the NRC's judgment that public health and safety continues to be adequately protected at Indian Point in each of these areas.

At Indian Point, the NRC had more than 20 staff and expert contractors overseeing the force-on-force security exercise. The exercise was also observed by the FBI, New York State Office of Public Security and other State and local officials. I should add at this point that there has been and continues to be excellent support from local, State and Federal authorities, including on-site National Guard, Coast Guard, and local law enforcement officers.

My observations of the pilot force-on-force exercise at Indian Point indicate that the licensee has a strong defensive strategy and capability. The Indian Point security force personnel successfully protected the plant from repeated mock-adversary attacks during the exercise.

The purpose of the force-on-force exercises is to identify deficiencies in nuclear power plant site protective strategies in defending against a design basis threat (DBT) so they can be promptly addressed by the licensee, and to train personnel in the response to an assault. The DBT represents the largest reasonable threat against which a regulated private guard force should be expected to defend under existing law. An improvement employed during the Indian Point force-on-force exercise was the licensee use of Multiple Integrated Laser Engagement System (MILES) equipment to enhance the realism of this exercise. MILES gear is a ground combat training system used by the Department of Defense and other agencies, incorporating

modified weapons fitted with laser transmitters which enable the exercise controllers to determine whether the security officers were able to successfully engage adversary forces. Additional information on the pilot force-on-force program is included in the enclosed Fact Sheet.

There is no doubt that terrorism has introduced challenges to nuclear power plants and the Nation. In response to the attacks of September 11, 2001, the NRC initiated new studies of the security and vulnerability of nuclear power plants, including assessments for land-based, water-borne and aircraft terrorist attacks. Although the studies will not be fully completed until the fall of this year, it is already clear that the planning basis for off-site emergencies remains valid in terms of timing and magnitude for the range of potential radiological consequences of a terrorist attack upon the reactors or spent fuel pools.

As you are aware, on July 25, 2003, the Federal Emergency Management Agency (FEMA) determined that it had reasonable assurance that appropriate protective measures to protect the health and safety of surrounding communities can be taken and are capable of being implemented in the event of a radiological incident at the Indian Point Energy Center. Based on this finding and in conjunction with our continuing oversight of the licensee's on-site emergency planning and preparedness, the NRC remains assured that emergency preparedness for this site is adequate. However, we recognize that planning for possible emergencies is an ongoing process. The NRC will continue to work closely with FEMA, State and local officials as well as the plant operator in their continuing efforts to improve emergency planning and preparedness. In this regard, NRC and FEMA have committed to work with State and local officials to include a simulated terrorist scenario in the next emergency preparedness exercise for Indian Point.

With respect to the safety performance of the Indian Point facility, the NRC has maintained heightened oversight during the past several years. Progress in strengthening station safety programs has been documented in our periodic plant performance reviews. In the near future, we will be issuing mid-cycle safety performance assessments for all 103 operating nuclear reactors and we will provide you with a copy of the performance assessment letter for the Indian Point plants.

I want to assure you that the NRC is committed to a strong and independent oversight program to ensure safety, security and emergency preparedness at Indian Point and all of our licensees.

Sincerely,

/RA/

Nils J. Diaz

Enclosure: Force-on-Force Fact Sheet

Identical letter sent to:

The Honorable Charles Schumer
United States Senate
Washington, D.C. 20510

The Honorable Hillary Rodham Clinton
United States Senate
Washington, D.C. 20510

The Honorable Sue W. Kelly
United States House of Representatives
Washington, D.C. 20515

The Honorable Nita M. Lowey
United States House of Representatives
Washington, D.C. 20515

The Honorable Maurice D. Hinchey
United States House of Representatives
Washington, D.C. 20515

The Honorable Eliot L. Engel
United States House of Representatives
Washington, D.C. 20515

The Honorable George E. Pataki
Governor of New York
Executive Chamber
State Capital Building
Albany, New York 12224

cc: The Honorable Sandra R. Galef
New York State Assembly
Albany, New York 12248

The Honorable Richard L. Brodsky
Chairman, Committee on Corporations,
Authorities and Commissions
New York Assembly
Albany, New York 12248

The Honorable Andrew J. Spano
County Executive, Westchester County
Michaelian Office Building
White Plains, New York 10601

The Honorable C. Scott Vanderhoef
County Executive, County of Rockland
Allison-Parris County Office Building
11New Hempstead Road
New City, New York 10956

The Honorable Edward A. Diana
County Executive, Orange County
Orange County Government Center
255 Main Street
Goshen, NY 10924

The Honorable Robert J. Bondi
County Executive, Putnam County
Putnam County Office Building
40 Gleneida Avenue, 3rd Floor
Carmel, New York 10512

August 29, 2003

The Honorable Tom Ridge
Secretary of Homeland Security
Washington, D.C. 20500

Dear Mr. Secretary:

As the second anniversary of the terrorist attacks of September 2001 approaches, the U.S. Nuclear Regulatory Commission (NRC) and the commercial nuclear industry continue to take steps to enhance security at licensed nuclear facilities and of radioactive material. I am writing on behalf of the Commission to inform you of some of the more significant actions that have been taken and those that are planned.

In former Chairman Meserve's letters dated September 5, 2002, and March 31, 2003, we outlined the steps the Commission had taken to evaluate and enhance security at NRC-licensed facilities since September 11, 2001¹. Since March 2003, the Commission has continued to enhance security requirements for nuclear power plants and for the handling of high-risk radioactive sources in the post-9/11 environment through organizational changes, Orders to our licensees, and many other actions. Upon taking office as Chairman, I announced that I would continue the agency's focus on security issues, and I reorganized both the Office of the Chairman and the Office of the Executive Director of Operations to help complete our remaining security initiatives and ensure their timely implementation. For example, in June 2003, I established the position of Deputy Executive Director for Homeland Protection and Preparedness to increase the agency's attention on cross-cutting issues that affect security, incident response, emergency preparedness, vulnerability assessments and mitigation strategies, and external integration of comprehensive strategies for these areas.

There is no doubt that terrorism has introduced challenges to nuclear power plants and the Nation. In response to the attacks of September 11, 2001, the NRC initiated new studies of the security and vulnerability of nuclear power plants, including assessments for land-based, water-borne and aircraft terrorist attacks. Although the studies will not be fully completed until the fall of this year, it is already clear that the planning basis for off-site emergencies remains valid in terms of timing and magnitude for the range of potential radiological consequences of a terrorist attack upon the reactors or spent fuel pools.

¹ Copies of these letters are available on our website (www.nrc.gov).

On April 29, 2003, the Commission issued Orders to nuclear power reactor and Category I fuel cycle facility licensees to require security enhancements to protect against the revised design basis threat (DBT). The Commission believes that the DBT represents the largest reasonable threat against which a regulated private guard force should be expected to defend under existing law. NRC has defined two DBTs, one for radiological sabotage and the other for theft or diversion of nuclear material. Under NRC regulations, nuclear power reactor and Category I fuel cycle facility licensees must provide high assurance in defending against the applicable DBT to ensure adequate protection of public health and safety and common defense and security.

The NRC also issued two other Orders on April 29, 2003, to enhance the readiness and capabilities of security force personnel at nuclear power plants. One Order establishes requirements to limit security force personnel working hours to provide reasonable assurance that the effects of fatigue will not adversely impact the readiness of security officers in performing their duties. The other Order requires additional measures regarding security officer training and qualification, including exercising the protective strategies and capabilities required to defend nuclear power plants against sabotage by an attacking force. It also requires frequent firearms training and qualification under a broad range of conditions representative of site-specific protective strategies.

We consider security performance assessment to be important and have resumed force-on-force exercises as part of a pilot program and have already conducted exercises at nine nuclear power plant sites. We are planning to conduct these exercises at a pace of approximately two per month in fiscal year 2004, consistent with the Commission's decision to conduct such exercises at each site on a three-year cycle going forward. Force-on-force exercises are conducted to assess and improve the performance of defensive strategies at licensed facilities. These exercises have been and are intended to be a primary means to conduct performance-based assessments of a licensee's security force and its ability to prevent radiological sabotage as required by NRC regulations. Our approach to security reflects the NRC's "defense-in-depth" safety philosophy, in which requirements for plant safety features and mitigation strategies, security measures, and emergency preparedness are addressed in an integrated manner. Recent force-on-force exercises have utilized Multiple Integrated Laser Engagement System (MILES) equipment to enhance the realism of exercises. MILES gear is a ground combat training system used by the Department of Defense (DOD), the Department of Energy (DOE), and other agencies, using modified weapons fitted with laser transmitters that add realism to exercises by simulating combat between protective and adversary forces.

The NRC has worked with DOE to identify radioactive materials of concern and to increase protection of high-risk radioactive sources which could be used in radiological dispersal or radiological exposure devices. The NRC/DOE work has now been captured in an appendix to the International Atomic Energy Agency's (IAEA's) Revised Code of Conduct on the Safety and Security of Radioactive Sources, which is discussed more later in this letter. In addition, NRC formed both a Materials Security Working Group and a related Steering Committee in June to work with the States to continue to enhance security for high-risk sources. On June 6, 2003, an Order was issued to all panoramic and underwater irradiator licensees requiring implementation of interim compensatory measures to enhance security. This is the first of what will be a series of additional security actions to be taken, if warranted, involving those NRC and Agreement State

licensees possessing high-risk radioactive material, as a follow-up to the Liberty Shield advisory, which NRC issued on March 17, 2003.

As a complement to our homeland protection initiatives, the NRC continues to enhance its incident response program. We actively participated in TOPOFF 2 in May 2003 not only in Washington, but also at the Seattle and Chicago venues. NRC has been extensively involved in the TOPOFF 2 lessons-learned process, particularly in the areas of radiological dispersal device consequence modeling and recovery. NRC continues to work with the Department of Homeland Security (DHS) and other Federal agencies on the integration of Federal Response Plans into a unified National Response Plan and National Incident Management System and on refinement of the National Preparedness Policy. We continue to coordinate with DOD, including NORTHCOM and NORAD, and plan to participate in forthcoming exercises such as Unified Defense 04 and Amalgam Virgo 04. We have recently entered into a Memorandum of Understanding (MOU) regarding information exchange with NORAD. We are currently developing an MOU with DHS which we believe would further enhance our working relationship.

These activities reflect continued progress in enhancing coordination and collaboration with other agencies on homeland protection. We have established an active liaison with DHS and strengthened existing coordination with other agencies and organizations, such as the Homeland Security Council, National Security Council, Federal Bureau of Investigation, Central Intelligence Agency, DOD, and Department of Justice, to promptly share intelligence information in a secure manner. Consistent with furthering homeland protection, NRC established a protected server system in February 2003 to facilitate sensitive information exchanges between NRC and licensees and cleared State officials.

In June 2003, NRC and DHS co-sponsored a two-day Homeland Security Workshop on civilian nuclear security issues for State officials at NRC headquarters. This workshop was attended by approximately 300 participants from DHS, State Homeland Security Advisors, State Liaison Officers, State Radiation Control Directors, and other Federal and State governments and organizations. We believe that the workshop further strengthened NRC and DHS linkages with these key State officials by increasing their awareness of DHS and NRC initiatives relating to homeland security and incident response.

NRC also actively participated in an international conference held in March 2003 in Vienna on protection of high-risk radioactive sources. The conference was jointly sponsored by the DOE, the Russian Federation, the IAEA, and others, and was attended by over 100 nations. Conference participants discussed key issues relating to the security of high-risk radioactive sources and the actions which must be taken worldwide to improve the protection of these sources. Since the March conference, NRC - - in partnership with the Departments of State and Energy - - has made key contributions to revisions to the IAEA's Code of Conduct for the Safety and Security of Radioactive Sources. The U.S. Government positions were subsequently adopted at a July 2003 IAEA meeting either as proposed or with modifications which were acceptable to the U.S. Government. NRC is now working with State officials through the Materials Security Working Group to establish an initial inventory of all high-risk radioactive sources possessed by licensees of NRC and the 33 Agreement States. NRC is also preparing a proposed export/import regime for high-risk radioactive sources, consistent with the revised Code of Conduct, and together with our colleagues at the Departments of State and Energy, we have held consultations with other supplier nations on export and import controls.

We have continued to work through the Homeland Security Council and the Office of Management and Budget to win passage of legislative proposals to enhance security of nuclear facilities and materials. The NRC supports the enactment of those provisions in H.R. 6, the "Energy Policy Act of 2003," which would enable licensee guards to possess more powerful weaponry, enlarge the classes of NRC-regulated entities whose employees would be subject to fingerprinting and criminal history background checks, expand NRC's regulatory jurisdiction to additional classes of radioactive material as a means of enhancing the protection of the public from use of the materials in radiological dispersal devices, and add new Federal criminal sanctions to cover acts that could endanger materials and activities regulated by the NRC.

In summary, the NRC has made, and will continue to make, significant progress in support of our Nation's efforts to enhance homeland protection and preparedness. Although this letter describes many of our efforts, it is by no means all inclusive. Please do not hesitate to contact me for additional information if you have specific questions.

Sincerely,

IRA

Nils J. Diaz

FPL

LICENSE RENEWAL

ST. LUCIE PLANT

ACRS FULL COMMITTEE MEETING

September 11, 2003



FPL

Agenda

- Aging Management Review (AMR) -
Concrete Below Ground Water
- Results of the recent St. Lucie Unit 2 Reactor
Vessel Head Penetration (RVHP) Inspection
- Commitment Tracking



Aging Management Review

- AMR for Concrete Below Groundwater:
 - St. Lucie concrete below groundwater requires aging management due to aggressive groundwater
 - The groundwater is aggressive because:
 - Chlorides > 500 ppm
 - Sulfates > 1500 ppm
 - Note: Groundwater pH is not < 5.5
 - St. Lucie groundwater phosphate content measured in March 2003 was 0.15 ppm



FPL

Aging Management Review

- Concrete exposed to groundwater
 - Containment - Lower portion of base mat
 - Steam Trestle - Lower portion of base mat
 - Reactor Auxiliary Building - Bottom floor and small portion of wall (walls and floor 3' thick)
 - Intake Structure - Walls exposed to sea water regularly inspected
 - Ultimate Heat Sink Dam - Walls exposed to sea water regularly inspected



Aging Management Review

- Aging of Concrete Below Groundwater is addressed by:
 - Design
 - Systems and Structures Monitoring Program



Aging Management Review

- Design
 - High Quality Concrete - Low Permeability recommended by ACI 201.2R:
 - W/C Ratio < 0.45 [St. Lucie ≤ 0.44]
 - ASTM C150, Type V Cement [St. Lucie used ASTM C150, Type II Cement, since Type V was adopted by ACI in 1977]
 - Appropriate Air Entrainment [St. Lucie 2.5% - 9% air entrainment]
 - Moist Curing for 7 days [St. Lucie used moist curing for 7 - 14 days]



Aging Management Review

- High Quality Concrete (Cont.)
 - High quality constituent materials including aggregates per ASTM C33, Cement per ASTM C150, and clean water [St. Lucie concrete meets all]
 - Cover over steel: 1.5" - 2" minimum [St. Lucie structures have 3" minimum cover]
 - Concrete exposed to saltwater should have a 28 day compressive strength of at least 5000 psi [St. Lucie structures are 4000 and 5000 psi concrete, however, test results indicate >5000 psi was achieved]
 - Waterproof Membranes



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Aging Management Review

- **Systems and Structures Monitoring Program**
 - Exposed interior and exterior concrete surfaces are visually inspected for signs of degradation (spalling, cracking, rust staining).
 - Buried concrete structures are inspected when excavated for any reason. Recent examples resulted in no degradation:
 - Unit 1 Containment (1997 SGRP)
 - UHS Dam (2002 CPS replacement)
 - Unit 1 CCW Building (2002 exploratory excavation)
 - Unit 1 Cask Crane foundations (2003 replacement)

Unit 2 RVHP Examination

- **Reactor Vessel Penetration (RVHP) Examination Scope for Spring 2003 Refueling Outage to address NRC Order EA-03-009**
 - 100% bare metal visual examination of the head surface and 102 RVHPs
 - The NRC approved an FPL Relaxation Request for the area under the shroud ring (<1% of RVH surface area)
 - 100% Ultrasonic Examination of all 102 RVHPs
 - The NRC approved an FPL Relaxation Request for the threaded region 1 inch below the weld on each CEDM RVHP

Unit 2 RVHP Examination

- Bare Metal Visual Examination Results
 - No evidence of leakage from any RVHP
 - No evidence of any wastage of the RVH steel
- Ultrasonic Examination Results
 - Completed scans on all penetrations
 - 91 CEDMs, 10 Instrument Columns (ICIs) and 1 Vent
 - Identified a single axial flaw in two CEDM penetrations



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Unit 2 RVHP Examination

- **Repair Efforts**
 - Removed lower portion of each CEDM nozzle and flaw by machining
 - Repaired both penetrations by welding the CEDM to the RVH mid thickness using the ambient temperbead weld process
 - Inspected the repair to be free of flaws
 - Weld repair process, repair configuration, and post repair inspection approved by NRC

Unit 2 RVHP Examination

- **Conclusions**
 - No RPVH wastage has occurred
 - Repairs restored the RVH to a condition free of cracks or degradation
- **Future Plans**
 - RVHP Examinations per NRC Order
 - FPL has ordered a new RVH

Commitment Tracking

- License Renewal Commitments are identified and tracked in accordance with the current St. Lucie licensing commitment tracking system
- FPL plans to have 70 to 80% of the commitments implemented prior to issue of the renewed licenses



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Commitment Tracking

- Once implemented, license renewal commitments are maintained through:
 - Configuration Control Documents
 - Change Control Processes
 - License Renewal Training



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Commitment Tracking

- Configuration Control Documents
 - License Renewal Design Basis Documents (one for each unit)-Incorporates 6-Column Tables
 - Program Basis Documents
 - Design Drawings
 - Calculations
 - UFSARs
 - Operations and Maintenance Procedures

Commitment Tracking

- Change Control Procedures-Revised to specifically address license renewal
 - Engineering Quality Instructions
 - Engineering Desk Top Procedures
 - Plant Procedure Change Process



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Commitment Tracking

- License Renewal Training
 - Initiated early
 - Multiple groups and management levels
 - Documented
 - On-Going



St. Lucie Units 1 and 2 License Renewal Safety Evaluation Report

Staff Presentation to the ACRS
Noel Dudley, Senior Project Manager
Office of Nuclear Reactor Regulation
September 11, 2003



Background

- › November 29, 2001: FPL submitted license renewal application
- › February 7, 2003: SER with Open Items issued
- › April 9, 2003: ACRS subcommittee briefing on SER with Open Items
- › July 7, 2003: SER issued



NRC Staff Presentation

- I. Nonsegregated-phase bus, pressurizer surge and spray nozzle thermal sleeves, and open items (T. Liu)
- II. Groundwater/phosphates/concrete/AMP (N. Dudley)
- III. TLAAs (N. Dudley)
 - A. Reactor Vessel Integrity
 - B. Core Support Barrel Repair

September 11, 2003

3



Discussion Items

- Changes since ACRS Subcommittee
 - Pressurizer surge and spray nozzle thermal sleeves
 - Nonsegregated-phase bus
- Total of 11 Open Items from SER

September 11, 2003

4



Pressurizer Surge and Spray Nozzle Thermal Sleeves

- Open Item 3.1.2.2-1
 - Safety Function - Thermal sleeves are designed to protect the pressurizer surge and spray line nozzles against the effects of thermal cycling
 - Applicable Aging Effect - Cracking of a thermal sleeve and loss of safety function
 - Analysis demonstrated aging management is not required.

September 11, 2003

5



Nonsegregated-Phase Bus

- Applicable to multiple plants
- Within the scope of license renewal
- Staff requested vendor verifications
- Applicant committed to AMP
- ISG-17 currently under staff development

September 11, 2003

6



Open Items Resolved

- 3.0.2.2-1: Verification that there is no open item in the AMP inspection report
- 3.0.5.7-1: Aging management of fire protection system piping wall thinning
- 3.1.0.3-1: Risk-informed methodologies for managing aging of small bore Class 1 piping
- 3.1.0.5-1: Reactor vessel surveillance capsule removal
- 3.1.1.2-1: Aging management of stress relaxation of non-Class 1 bolting material
- 3.1.2.2-1: Pressurizer surge and spray nozzles thermal sleeves

September 11, 2003

7



Open Items Resolved

- 3.0.5.10-1: Manage aging of intake cooling water system small bore piping
- 3.1.0.1-1: Manage aging of nickel-based alloy components
- 3.1.0.1-2: Alloy 600 Inspection Program
- 3.6.2.1-1: Fuse holders
- 4.6.4-1: Alloy 600 instrument nozzle repairs

September 11, 2003

8



Below Grade Concrete

- Concrete structures are in an aggressive ground water environment
- Systems and Structures Monitoring Program (SSMP)
 - Periodic inspections of structure interiors
 - Inspections conducted when structures are excavated

September 11, 2003

9



Time-limited Aging Analyses (TLAAs)

- 10 CFR 54.21 (c) (1): Applicant shall demonstrate that
 - Analysis valid for period of extended operation (PEO)
 - Analysis projected to end of PEO
 - Manage the effects of aging

September 11, 2003

10



Reactor Vessel Neutron Embrittlement Upper-Shelf Energy (USE)

- ▶ Analysis of USE projected to end of PEO
 - ▶ Minimum limit of 50 ft-lbs
 - ▶ Unit 1: Lowest value was 56 ft-lbs
 - ▶ Unit 2: Lowest value was 70 ft-lbs
- ▶ Staff performed independent calculations

September 11, 2003

11



Reactor Vessel Neutron Embrittlement Pressurized Thermal Shock (PTS)

- ▶ Analysis of PTS projected to end of PEO
- ▶ Staff performed independent calculations

	Limit	Unit 1	Unit 2
Plates/Forgings/ Axial Welds	270 degrees ✓	241 degrees	172 degrees
Circumferential Welds	300 degrees ✓	65 degrees	62 degrees

September 11, 2003

12

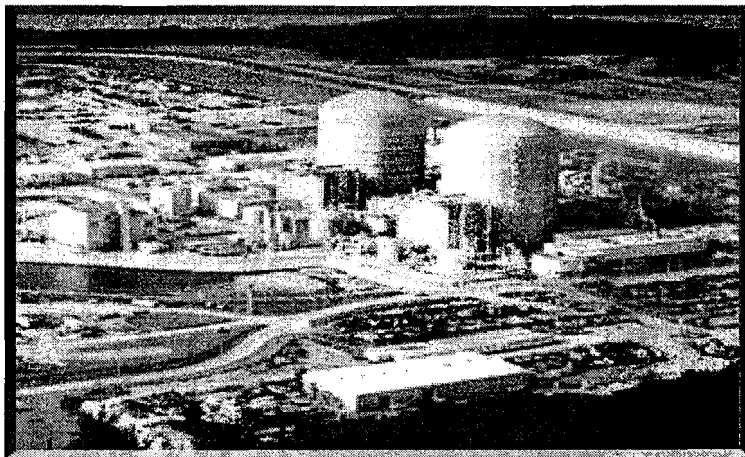


Core Support Barrel Repairs

- › Thermal shield and support system failed
- › Thermal shield was removed
- › Core support barrel was repaired
 - › Plugs
 - › Patches
- › Verified pretension on plugs
- › Re-analyzed loss of pretension projected to end of period of extended operation (PEO)
- › Staff approved analysis results

September 11, 2003

13



September 11, 2003

14

Regulatory Guide x.xxx
***“An Approach for Determining
the Technical Adequacy of PRA
Results for Risk-Informed
Activities”***

[formerly DG 1122 (and associated SRP)]

Advisory Committee on Reactor Safeguards

**Presented by:
Mary Drouin
Gareth Parry**

September 11, 2003

RECENT HISTORY

- ❑ Since staff briefing to ACRS in April, 2003. . .
 - ▶ Numerous discussions with ASME in resolution of staff objections
 - ▶ Staff attended, as observers, the peer review of the San Onofre PRA
 - ▶ Staff revised guide based on public comments, SONGS peer review, and ACRS comments
 - ▶ Public meeting on September 4, 2003
 - ▶ Staff ready to use as regulatory guide for trial use

PURPOSE OF MEETING

- Obtain ACRS approval to issue as Regulatory Guide for Trial Use

OUTLINE

- ❑ Stakeholder comments:
 - ▶ Public
 - ▶ Observations from SONGS peer review
 - ▶ Advisory Committee on Reactor Safeguards
- ❑ Impletation of regulatory guide
- ❑ Pilot application of regulatory guide
- ❑ September 4, 2003 public meeting
- ❑ Schedule

PUBLIC COMMENTS

- Six organizations provided comments
 - ▶ Nuclear Energy Institute
 - ▶ American Society of Mechanical Engineers
 - ▶ Dominion
 - ▶ South Texas Project Electric Generating Station
 - ▶ BWR Owner's Group
 - ▶ Framatome
- Majority of comments received concerned staff positions on ASME standard
- Minor (editorial) comments received on Appendix B (staff position on NEI 00-02 and NEI Self-assessment process)
- No comments received on SRP Chapter 19.1
- Consensus that the staff should move forward to publish the guide "for trial use" and test the guide via pilot applications
- Staff response to all public comments will be documented with publication of guide

PUBLIC COMMENTS (cont'd)

Summary of Major Comments

- Purpose of guide, as stated, does not adequately describe the intent of the guide, and relationship of guide to other guidance documents (e.g., RG 1.174) not clear
 - ▶ Additional clarification has been added

- Disagree that a quantitative definition of “significant” is needed
 - ▶ Staff disagrees, qualitative definitions are vague and subject to interpretation and therefore do not provide the consistency and uniformity looking for in the standard (also ACRS, Comment #1)
 - ▶ Without such a definition, staff review would increase
 - ▶ Definition is context dependent, therefore, the staff has proposed different definitions
 - ▶ Plan to test the definitions (or others) via several applications before finalizing

PUBLIC COMMENTS (cont'd)

For Example:

- ❑ *significant basic event*: those basic events (i.e., equipment unavailabilities and human failure events) that have a Fussell-Vesely importance greater than 0.005 OR a risk-achievement greater than 2.
- ❑ *significant cutset (relative to sequence)*: those cutsets, when ranked, comprise 95% of the sequence core damage frequency (CDF) or the large early release frequency (LERF), OR that individually contribute more than 1% to the sequence CDF or LERF.
- ❑ *significant cutset (relative to CDF)*: those cutsets, when ranked, comprise 95% of the CDF or LERF, OR that individually contribute more than 1% to CDF/LERF.
- ❑ *significant accident sequence*: a significant sequence is one of the set of sequences, defined at the functional or systemic level that, when ranked, comprise 95% of the CDF or LERF, OR that individually contribute more than ~1% to the CDF or LERF.
- ❑ *significant containment challenges*: those containment challenges that contribute to the set of significant accident sequences.

PUBLIC COMMENTS (cont'd)

- *key assumption*: an assumption made in response to a key source of uncertainty, or one that is made for modeling convenience, in the knowledge that a more detailed model would produce different results; that is, different in terms of significant sequences, relative importance of significant sequences, or estimates of CDF/LERF (e.g., assumption that system X has the same impact as system Y for systems with different capabilities).

- *key source of uncertainty*: a source of uncertainty that is related to an issue where there is no consensus approach or model (e.g., choice of data source, success criteria, RCP seal LOCA model, human reliability model) and where the choice of approach or model is known to have an impact on the determination of PRA results in terms of introducing new accident sequences, changing the relative importance of sequences, or affecting the overall CDF or LERF estimates that might have an impact on the use of the PRA in decision-making.

PUBLIC COMMENTS (cont'd)

- Additional clarification of guide to other guidance documents such as RG 1.174 is needed
 - ▶ Clarification been added
- Large late release should not be included as a risk metric
 - ▶ Large late release is not a risk metric
 - ▶ Guide clearly states that CDF and LERF are the risk metrics
- Disagree with staff position of a peer review following a PRA maintenance
 - ▶ Staff has revised its positions and agrees that a peer review following a PRA maintenance is not needed
- Disagree with the need for a peer review following a PRA upgrade
 - ▶ The need for a peer review following a PRA upgrade is required by the ASME standard and is not a staff objection
 - ▶ The staff agrees with the ASME position
- Other comments dealt with specific wording to provide clarification to the guide

PUBLIC (ASME) COMMENTS

- ASME letter in response to public review and comment
 - ▶ Staff objections that were considered appropriate, publish in an Addendum that incorporates NRC position
 - ▶ Staff objections that were not considered appropriate, submit comments supporting ASME position

- Meeting and numerous discussions to resolve disagreements

- NRC “Inquiry” letter sent to ASME summarizing understood changes to be reflected in the Addendum and remaining staff objections with staff position

PUBLIC (ASME) COMMENTS (cont'd)

Summary of Major Areas of Disagreement

- Definition of significant
 - ▶ See previous response

- Use of the term recovery versus repair
 - ▶ Staff does not define “repair” as a subset of “recovery”
 - ▶ Recovery addressed via human reliability analysis
 - ▶ Repair addressed via actuarial data
 - ▶ *Recovery*: PRA modeling term representing restoration of the function caused by a failed SSC by bypassing the failure. Such a recovery can be modeled using HRA techniques regardless of the cause of the failure.
 - ▶ *Repair*: A general term describing restoration of a failed SSC by correcting the failure and returning the failed SSC to operability. HRA techniques cannot be used since the method of repair is not known without knowing the specific cause.

PUBLIC (ASME) COMMENTS (cont'd)

Summary of Major Areas of Disagreement

- ❑ Insufficient factors in crediting recovery actions
 - ▶ Staff believes other factors are equally important
 - ▶ E.g., availability of resources, time required to complete action relative to time available, dependence (common instrumentation, etc.)
- ❑ Assess appropriateness of key assumptions by the peer review team
 - ▶ Staff believes a key objective of the peer review (also ACRS, Comment #2)
 - ▶ “...determine the strengths and weaknesses in the PRA. Therefore, the peer review shall also assess the appropriateness of the key assumptions.”
- ❑ Identification of minimum set of review topics for the peer reviewer
 - ▶ Staff believes that a minimum set ensures the topics are examined, provides for uniformity and consistency between peer reviews, and allows the team flexibility in determining the scope and level of detail of each topic (also ACRS, Comment #4)
 - ▶ “For each PRA element, a set of review topics required for the peer review team are provided in ...”

SONGS PEER REVIEW, STAFF OBSERVATIONS

ASME standard needs additional guidance in interpreting and applying some of the requirements

Supporting requirements are the same across all capability categories

- ▶ Staff has added a clarification in Appendix A, Section 4.5
- ▶ "...In these tables, some action statements apply to only one capability category, and some extend across two or three capability categories. When an action statement extends to more than one category, it applies equally to each Capability Category without any need to identify a corresponding capability category. The distinction between categories is made in other SRs. That is, the scope of applicability will be determined by the scope and level of detail required by other associated SRs.

For example:

- IE-A2 requires the initiating events and event categories to be identified that can challenge the plant. There should not be a distinction in the scope of identifying the events. However, the treatment of the identified events does vary in scope and detail as seen, for example, by AS- A9.
- HR-F1 is a general action statement about the way a human failure event is included in the PRA model, while HR-F2 distinguishes different levels of analysis for the subsequent quantification.

SONGS PEER REVIEW, STAFF OBSERVATIONS (cont'd)

- ❑ Determination of when a supporting requirement is considered not to have been met
 - ▶ Staff has added guidance in Section 2.1
 - ▶ “As a general rule, compliance with a requirement of the Standard is demonstrated if there is clear evidence of an intent to meet the requirements. Many of the requirements apply to several parts of the PRA model. For example, the requirements for systems analysis apply to all systems modeled, and certain of the data requirements apply to all parameters for which estimates are provided. If among these systems or parameter estimates there are a few examples of non-compliance, this does not mean that the requirement has not been met, if for the majority, the requirement has been met, the few examples can then be put down to mistakes or oversight. If, however, there is a systematic failure to address the requirement, e.g., component boundaries have not been defined at all, then the requirement has not been complied with. In either case, (1) the examples of non-compliance are to be rectified, or demonstrated not to be relevant to the application, and (2) documented.”

ACRS COMMENTS

□ Comment #1:

The draft final Regulatory Guide should include definitions of the terms “dominant,” “important,” “key,” and “significant.”

- ▶ The staff has included definitions of the terms in the draft regulatory guide.
 - Delete the term “dominant”
 - Use term “significant,” but in proper context; e.g.,
 - Significant basic event
 - Significant accident sequence
 - Definition context dependent
- ▶ The staff plans to test these definitions during the pilot application of the regulatory guide and revise guide as appropriate

ACRS COMMENTS (cont'd)

Comment #2:

The peer review of the probabilistic risk assessments (PRAs) should include an assessment of the uncertainties and the validity of key assumptions.

- ▶ The staff has taken objection in Appendix A, Section 6.1
- ▶ “....The peer review shall assess the PRA to the extent necessary to determine if the methodology and its implementation meet therequirements of this Standard to determine the strengths and weaknesses in the PRA. Therefore, the peer review shall also assess the appropriateness of the key assumptions...”

Comment #3:

The draft final Regulatory Guide should include guidance on how to perform sensitivity and uncertainty analyses.

- ▶ The ASME Standard provides requirements on the performance of sensitivity and uncertainty analysis.
- ▶ The staff is developing a separate regulatory guide

ACRS COMMENTS (cont'd)

□ Comment #4:

To ensure consistency, the draft final Regulatory Guide should prescribe a minimum list of topics to be included in the peer review.

- ▶ The staff has taken objection in Appendix A, Section 6.3
- ▶ “The peer review team shall use the requirements....of this standard. For each PRA element, a set of review topics required for the peer review team are provided in the subparagraphs of para. 6.3. ~~Some subparagraphs of para. 6.3 contain specific suggestions for the review team to consider during the review.~~ Additional material for those Elements may be reviewed depending on the results obtained. ~~These suggestions are not intended to be a minimum or comprehensive list of requirements.~~ The judgement of the reviewer shall be used to determine the specific scope and depth of each review topic for each PRA element.”

ACRS COMMENTS (cont'd)

□ Comment #5:

The staff needs to clarify how the capability Categories are consistent with the provision in the Regulatory Guide that the event probabilities reflect the actual operating history and experience of the plant as well as applicable generic experience.

- ▶ The staff agrees that each Capability Category has to reflect the actual operating history and experience of the plant; however, there may be differences in the level of detail for each Capability Category.
- ▶ The staff has revised the guide to clarify this issue, Section 1.2.1, 5th paragraph
- ▶ "...The estimation process....has the ability to combine different sources of data in a coherent manner, including ~~and represents~~ the actual operating history and experience of the plant when it is of sufficient quality, and applicable generic experience ~~as applicable~~."
- ▶ The staff believes that the ASME definition in Table 1.3-1 for Category I and high level requirements HLR-DA-C and HLR-DA-D along with their supporting requirements are consistent with the regulatory guide
 - 1.3-1: Use of generic data/models acceptable....
 - HLR-DA-C: Generic parameter estimates shall be chosen....
 - HLR-DA-D: The parameter estimates shall be based on relevant generic industry....

ACRS COMMENTS (cont'd)

☐ Comment #6:

The staff should provide guidance on acceptable qualitative characterization of risk contributions not calculated in limited-scope PRAs. Further in the letter, the ACRS notes that *“DG-1122 states that, for many applications that involve total plant risk, the risk characterization should account for all plant operating states and initiating events either quantitatively or qualitatively. More guidance is needed on this subject.”*

- ▶ In DG-1122, the intent of a “qualitative assessment” was meant to include methods other than a PRA, such as a bounding analysis.
- ▶ As note, a bounding analysis is not “qualitative” but “quantitative”
- ▶ The staff has deleted this statement from the guide
- ▶ The scope of this guide is to provide guidance on the technical acceptability of risk results (insights) determined from a PRA
- ▶ The staff is developing a separate regulatory guide that provides guidance for methods other than PRA is assessing the risk

IMPLEMENTATION OF GUIDE

- ❑ Current reviews:
 - ▶ Subjective in its scope and level of detail
 - ▶ Dependent on previous reviews
 - IPE
 - NEI Peer review
 - ▶ Little guidance on what to submit to answer the issue of PRA quality

- ❑ Implementation:
 - ▶ More focused, consistent and uniform reviews
 - ▶ More confidence that base PRA is adequate
 - ▶ Minimize staff review for complex applications and risk-informed activities; for example, those using the complete PRA (e.g., 50.69)
 - ▶ Credit for staff reviews in future applications
 - Credit dependent on application scope (extent to which PRA used, and therefore reviewed, in the application)
 - ▶ Increased public confidence
 - ▶ Provides basis for staff acceptability

PILOTS

- Provide assistance and clarification; for example,
 - ▶ Interpretation of documentation needs
 - ▶ Interpretation of requirements
 - ▶ Interpretation on staff position

- Provide guidance on scope and level of detail of staff review

- For pilot only, a “detailed” review may be required to identify areas of clarification, etc.
 - ▶ In form of audit

- Pilot of a generic application is desirable to determine applicability of regulatory guide

SEPTEMBER 4 PUBLIC MEETING

- Public interested in how addressing insights from the peer review of the SONGS PRA
 - ▶ Agreed with staff position included in the guide
 - ▶ Staff believes detail should be worked out during the trial period and incorporated into standard (preramble)
 - ▶ Public felt the detailed resolution should be in ASME standard
- Public interested in how will the guide be “invoked”
 - ▶ Only apply to pilots
 - ▶ How will current review process be impacted
 - ▶ Will applications of pilots be “held-hostage” to the trial period of the guide
- Staff is working on a “implementation/pilot application plan”
 - ▶ E.g., address what is to be tested
 - ▶ Hold public meetings to solicit input
- Agreement to move forward as quickly as possible in issuing the guide for trial use
- Should be additional pilots beyond South Texas, NEI to pursue

NEXT STEPS.....

DG 1122 and SRP Chapter 19.1

- Publish regulatory guide for trial use
 - ▶ Contingent on letter from ACRS approving publication
- Develop plan for implementation and pilot application; e.g.,
 - ▶ What to be tested
 - ▶ Development of questions and answers
- Implement guidance in pilot (and non-pilot) applications
- Continue to interact with public
- Revise guidance as appropriate



*United States
Nuclear Regulatory Commission*

505th ACRS Meeting

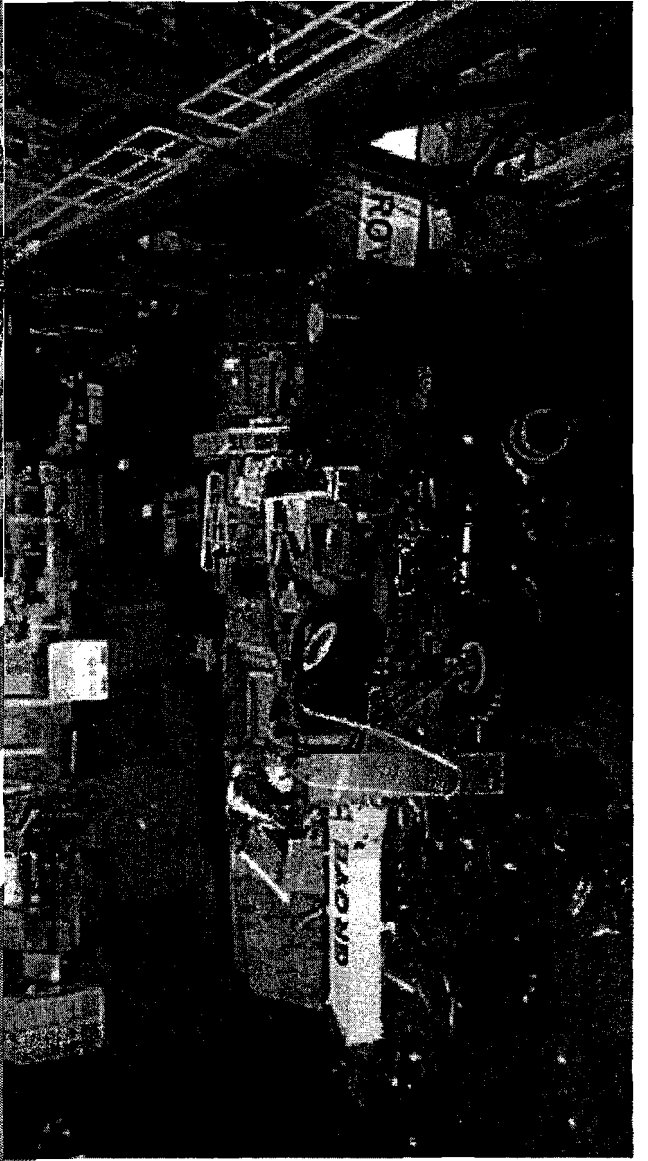
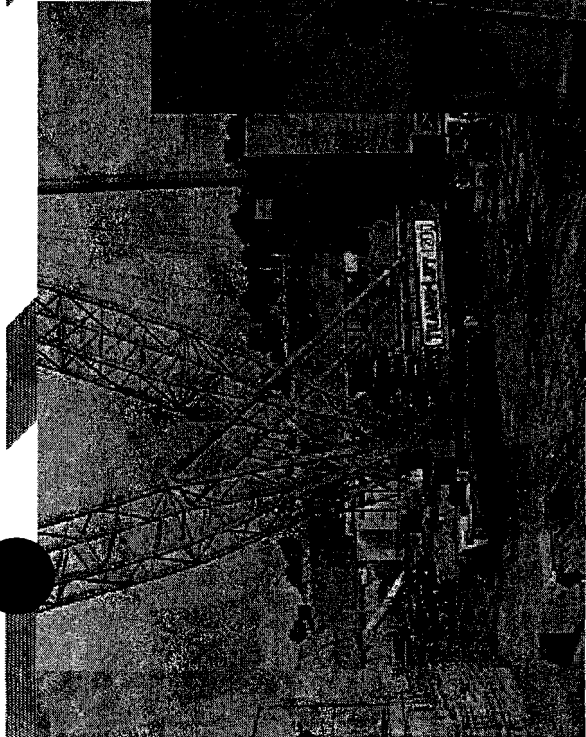
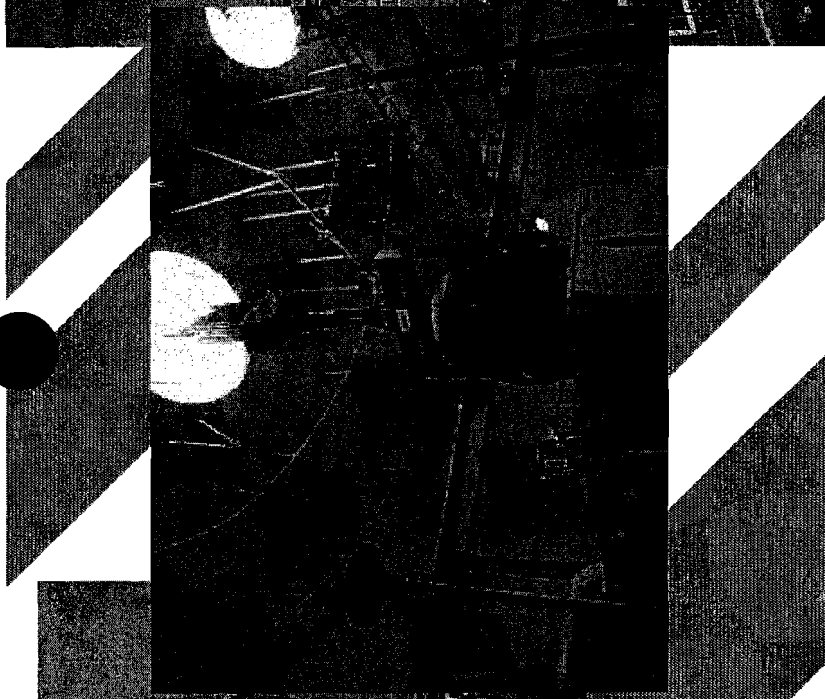
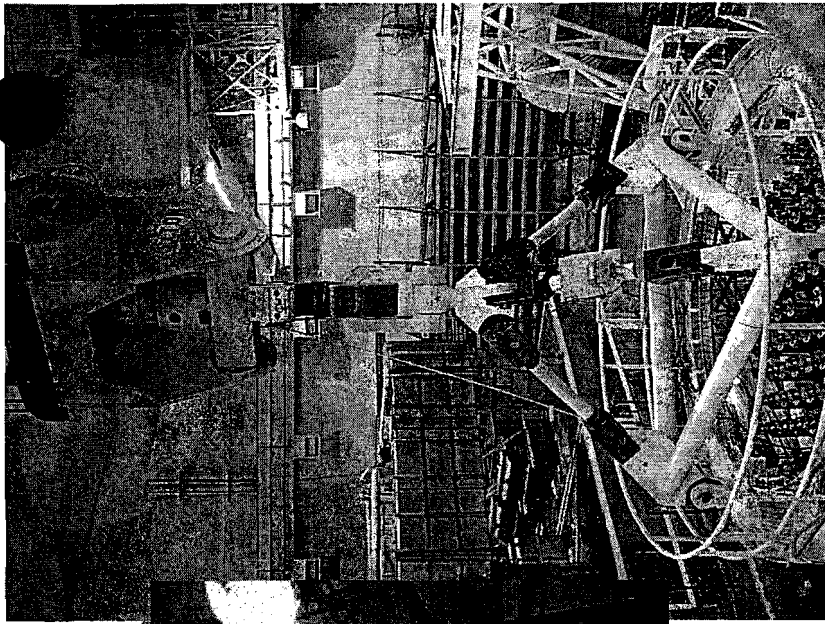
**A Survey of Crane Operating Experience at
U.S. Nuclear Power Plants
from 1968 through 2002**

Generic Issue 186

R. L. Lloyd

Office of Nuclear Regulatory Research

September 11, 2003



Generic Issue 186

- **Unresolved Safety Issue A-36 (1970s)**
- **Guidance in NUREGs-0612 and -0554**
- **GL-85-11: Further Actions to Reduce Risk Not Necessary**
- **Bulletin 96-02: Movement of Heavy Loads**
- **NRR Concern for Heavy Load Drop Consequences (1999)**
- **Candidate Generic Issue 186 (1999)**

Observations and Recommendations

- **Technical Assessment (NUREG-1774)**
- **Draft Recommendations for Resolution**

MD 6.4 – Generic Issues Program

- **Stage 1: Identification**
- **Stage 2: Initial Screening**
- **Stage 3: Technical Assessment**
- **Stage 4: Regulation and Guidance Development**
- **Stage 5: Regulation and Guidance Issuance**
- **Stage 6: Implementation**
- **Stage 7: Verification**

Pilot Plants

- **Brown's Ferry Units 1, 2, and 3**
- **Comanche Peak Units 1 and 2**
- **Diablo Canyon Units 1 and 2**
- **Dresden Units 2 and 3**
- **Grand Gulf**
- **Limerick Units 1 and 2**
- **Oconee Units 1, 2, and 3**
- **Oyster Creek**
- **Palo Verde Units 1, 2, and 3**

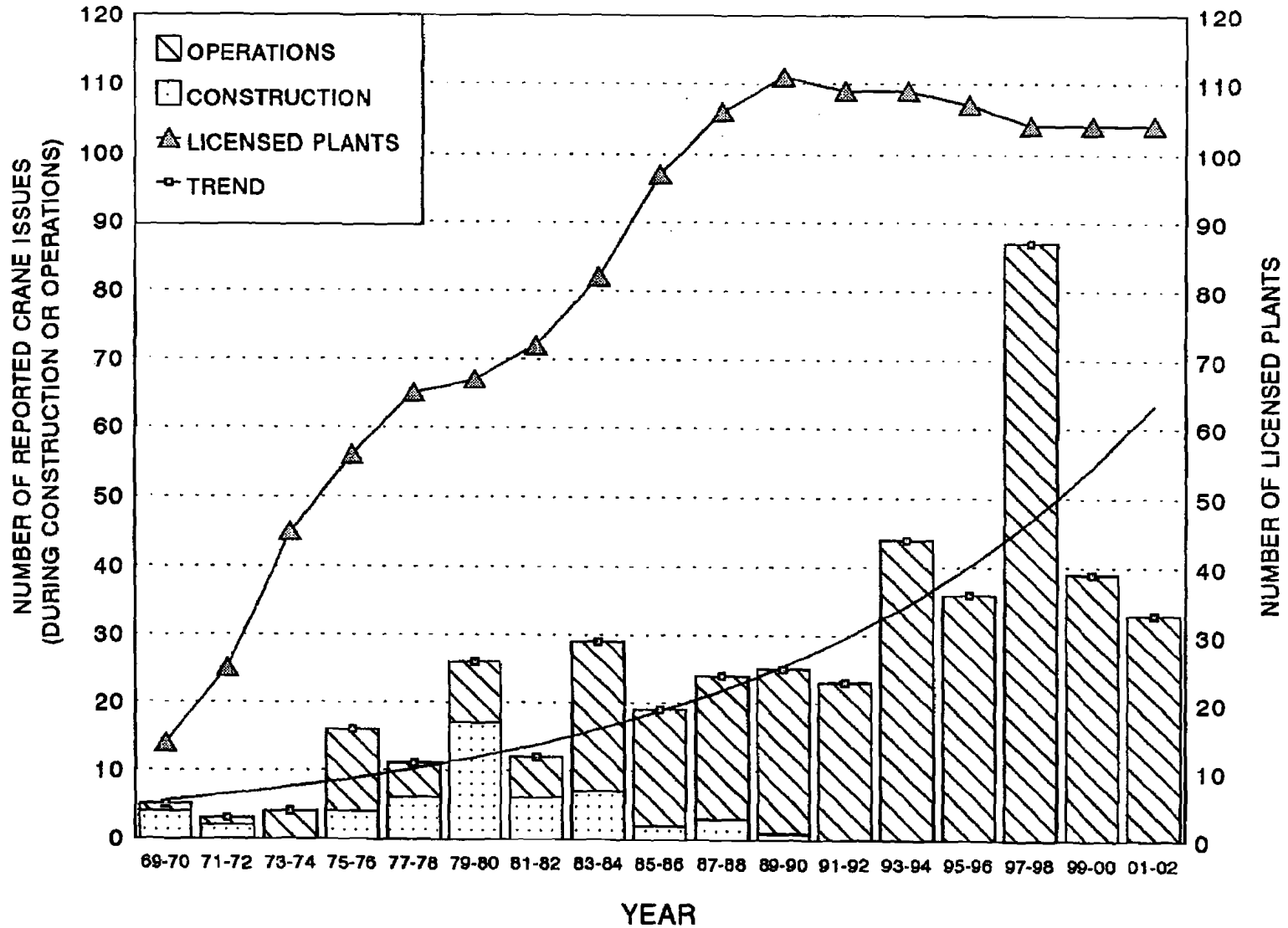
Database Categories

- **Plant and Event Date**
- **Crane Type**
- **Crane Component Deficiency**
- **Reported Cause of Event**
- **Safety Implication of Event**
- **Event Abstract**

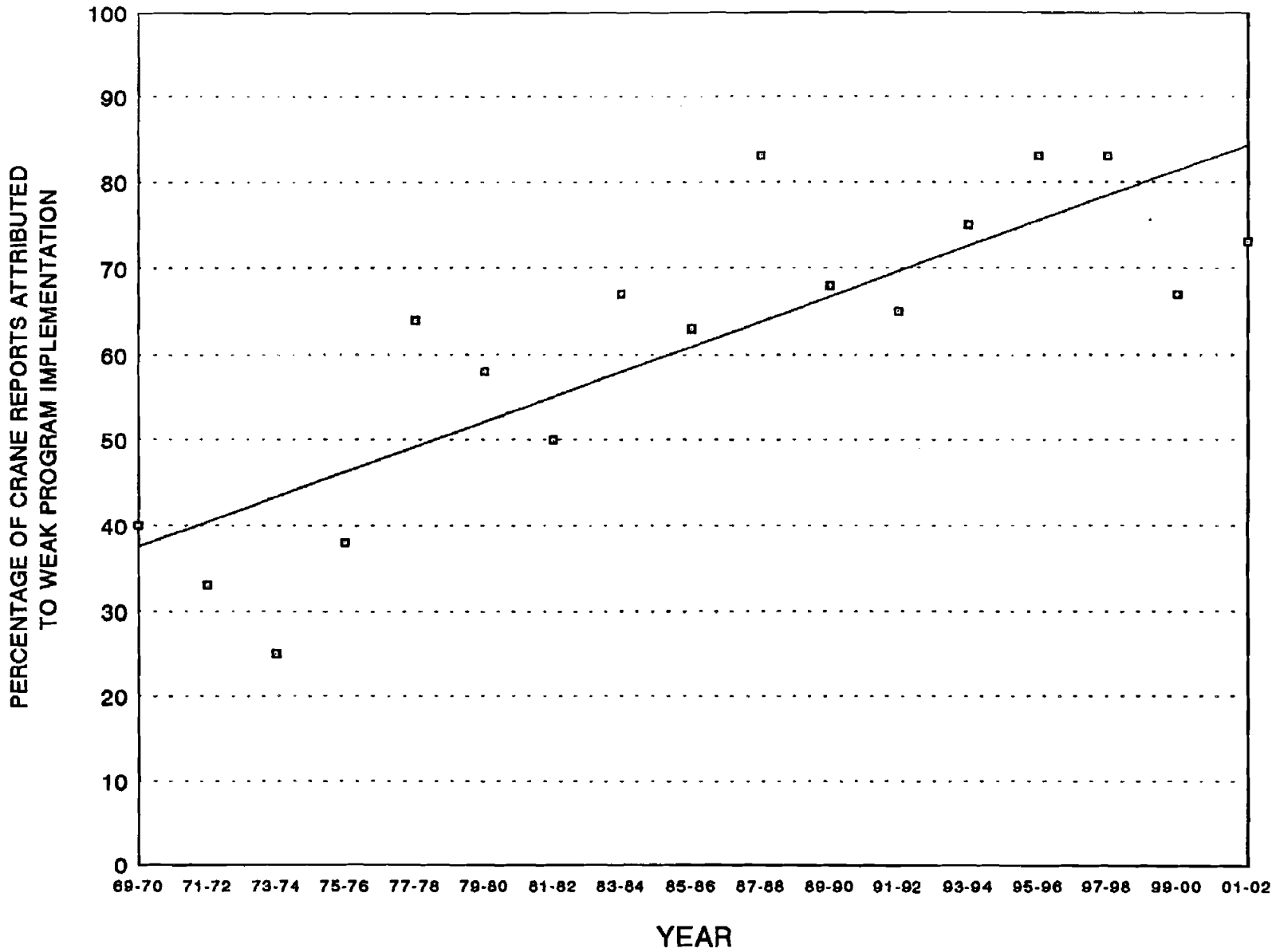
Crane Operating Experience Studies

- **NUREG-0612, Heavy Loads (1980)**
- **DOE, Crane Incidents (1996)**
- **Navy, Crane Experience Data (1999)**
- **OSHA, Crane Accidents (2000)**
- **EEG-74, WIPP (2000)**
- **NUREG-1774, Crane Experience (2003)**

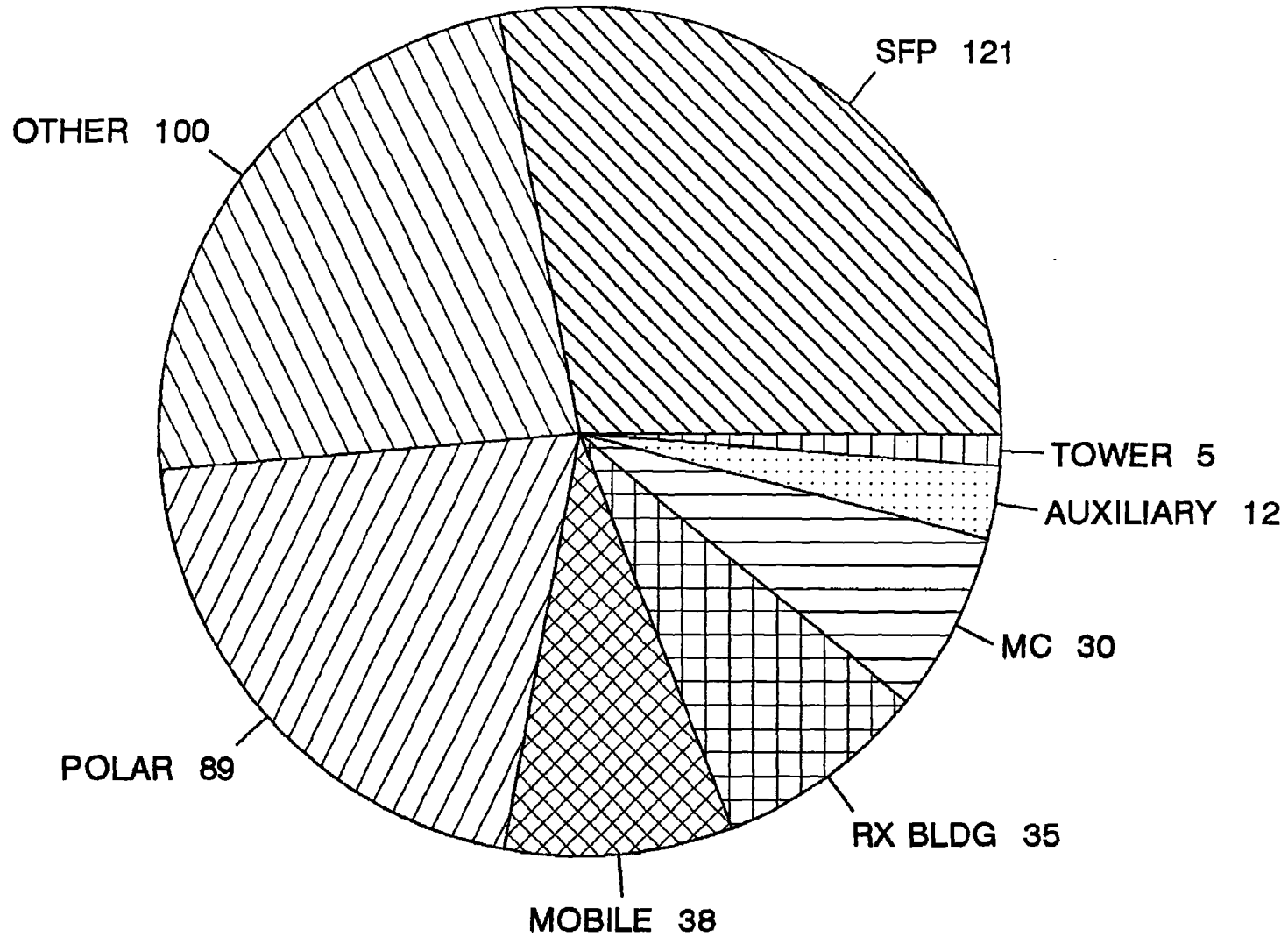
Reported Crane Issues



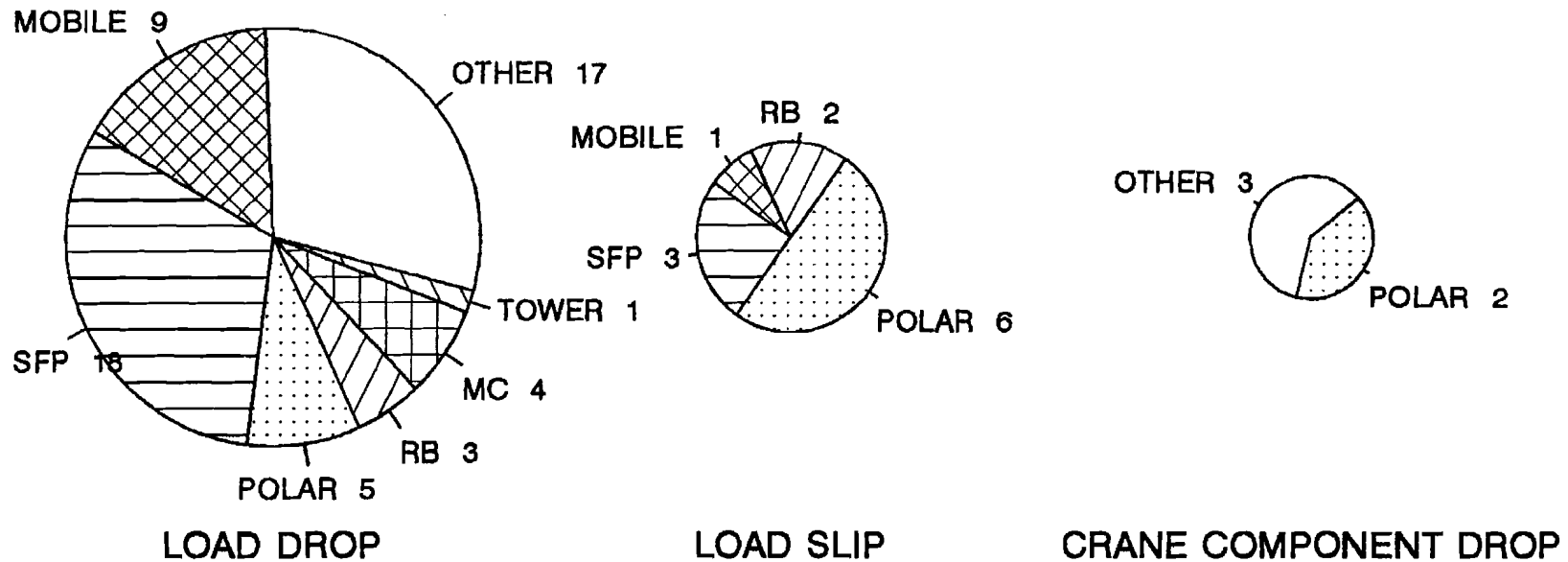
Weak Program Implementation



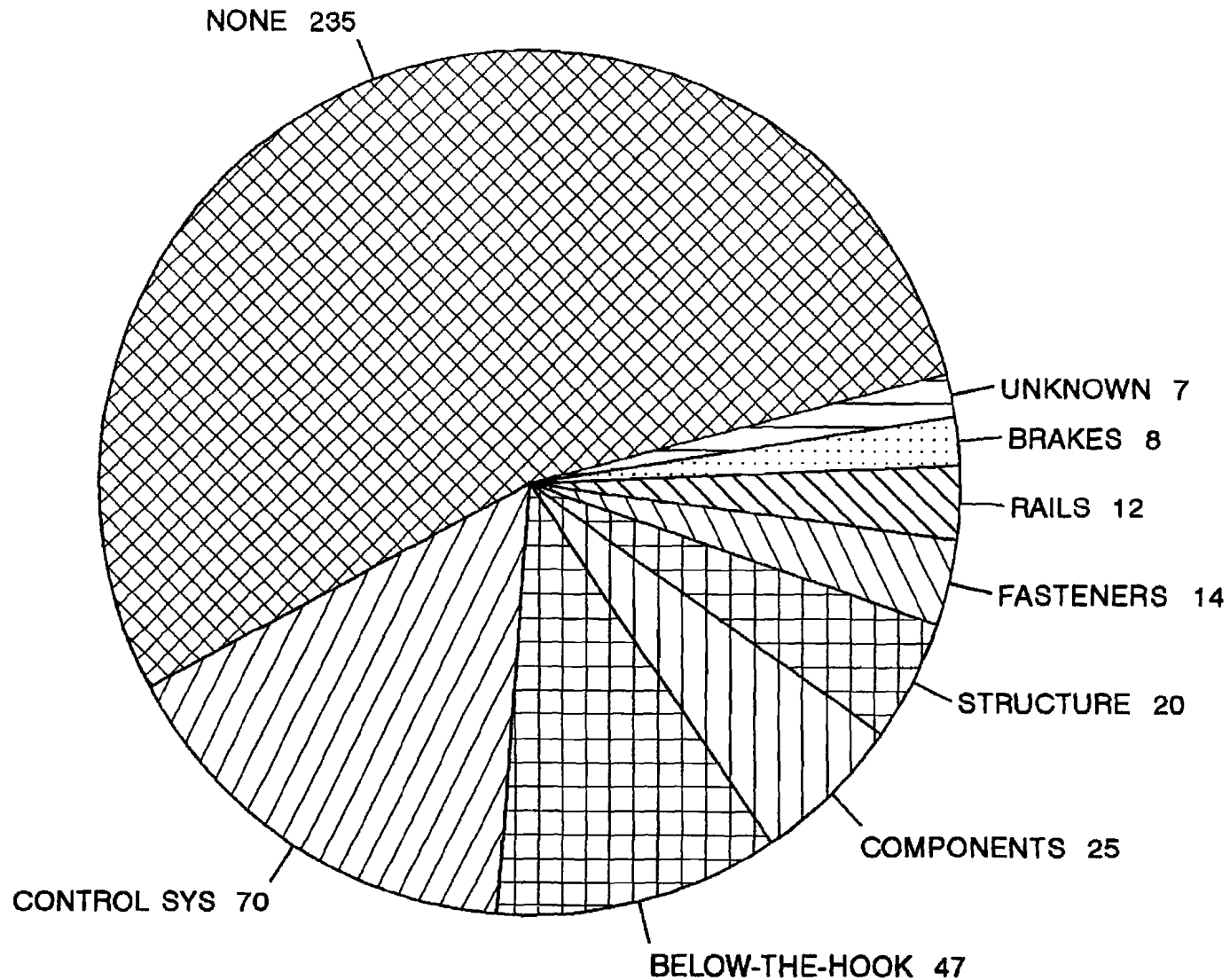
Crane Issue Distribution by Crane Type



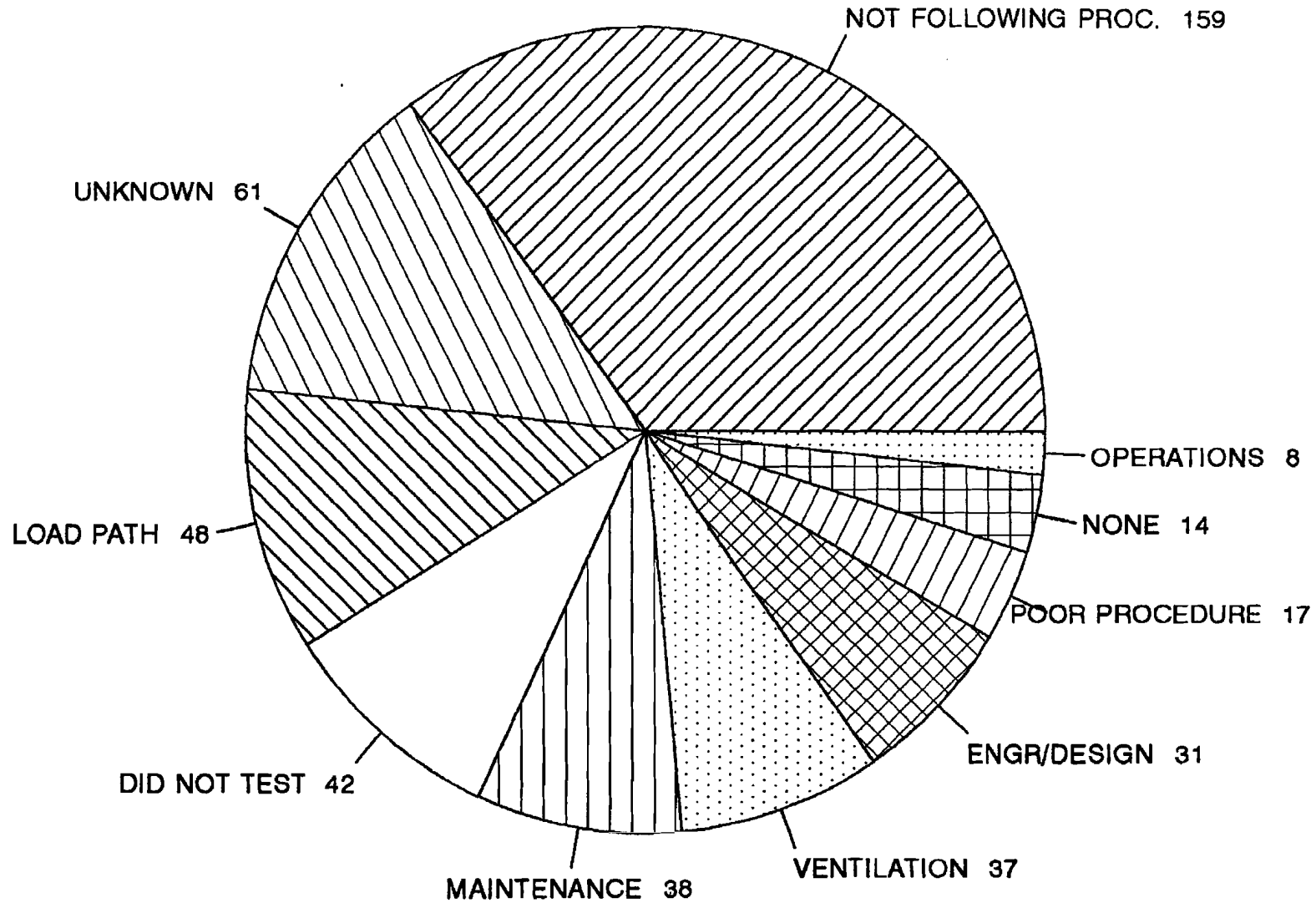
Crane Types Involved in Drops and Slips



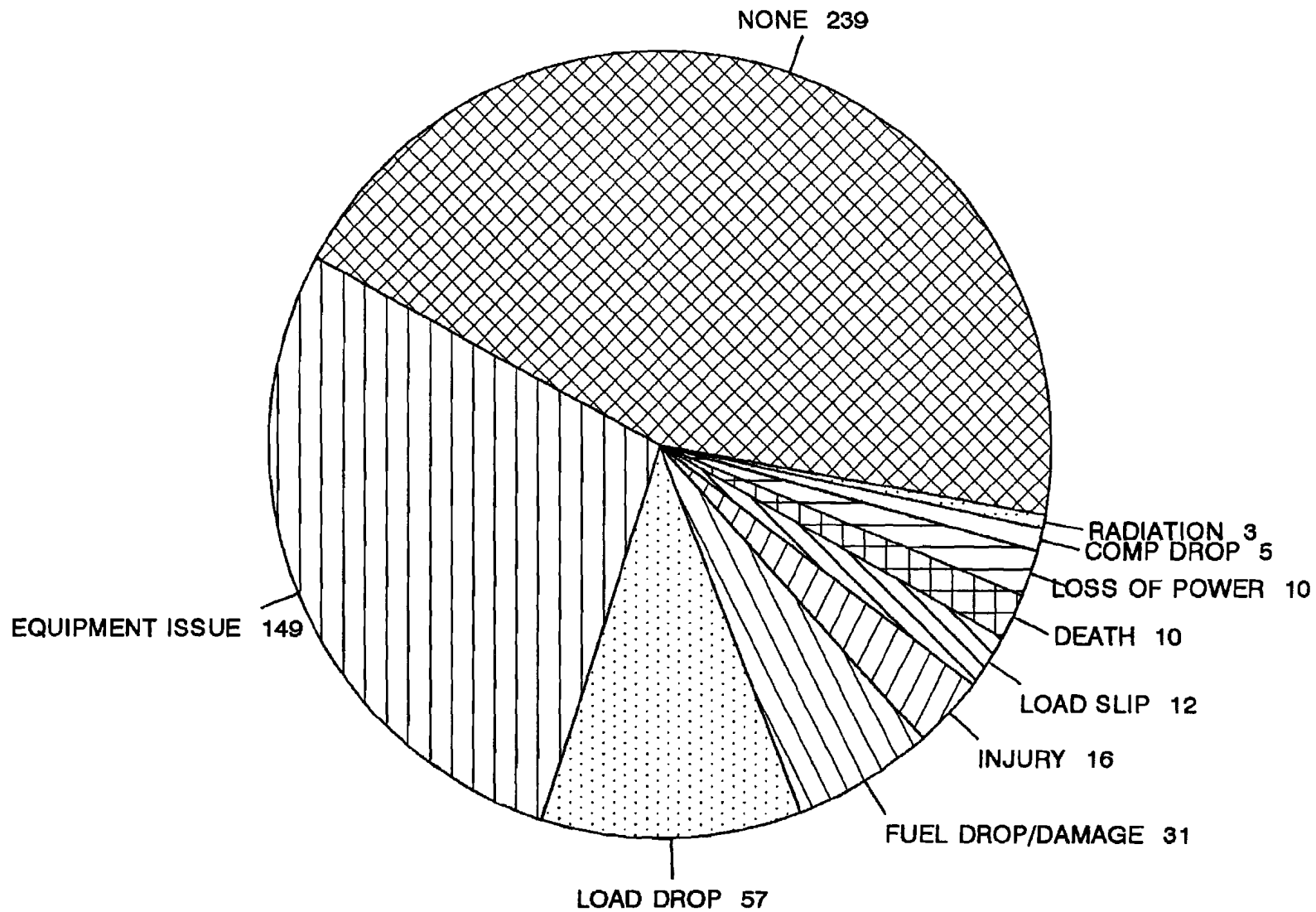
Crane Events Due to Hardware Deficiencies



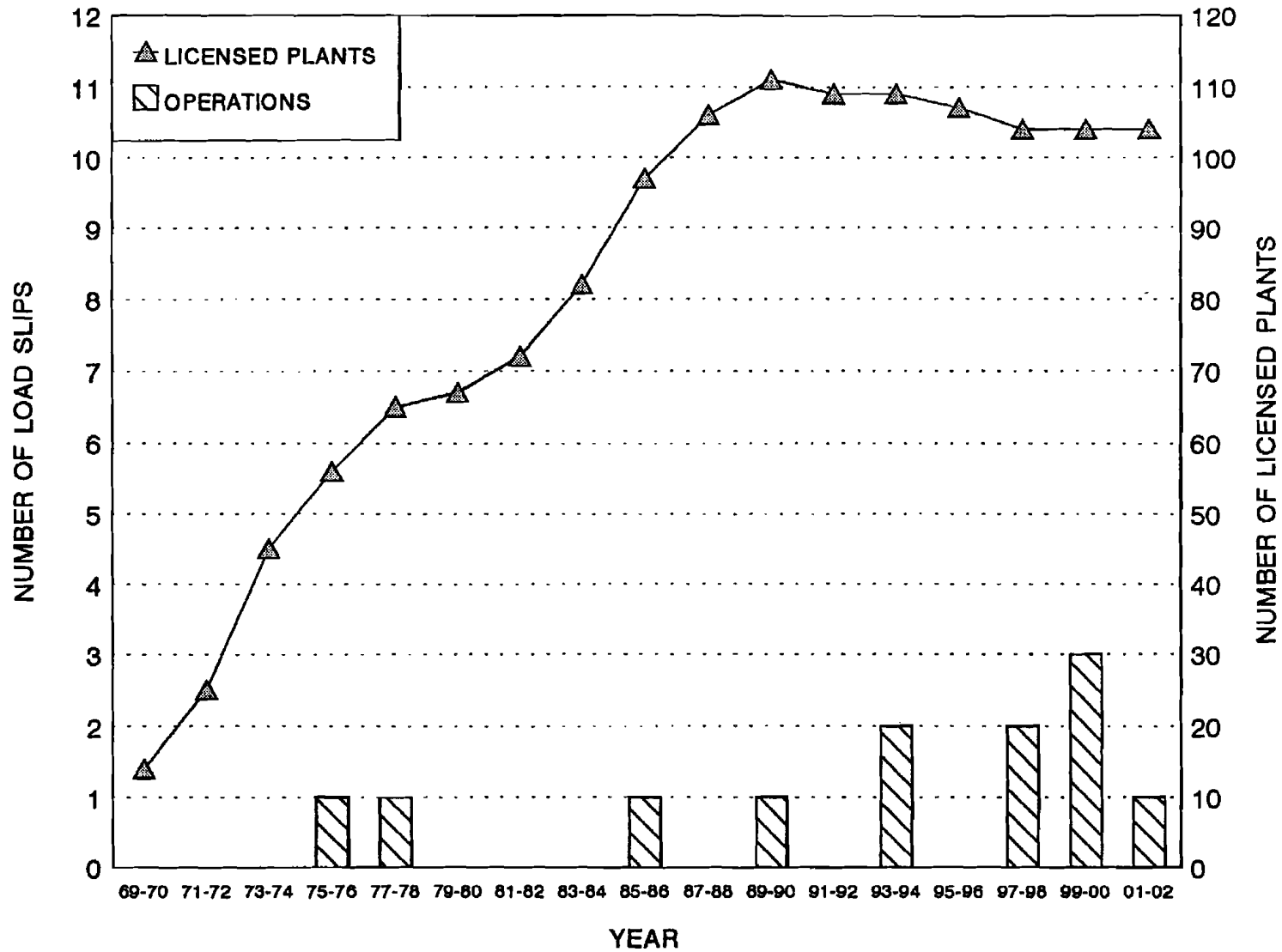
Principal Reasons for Crane Events



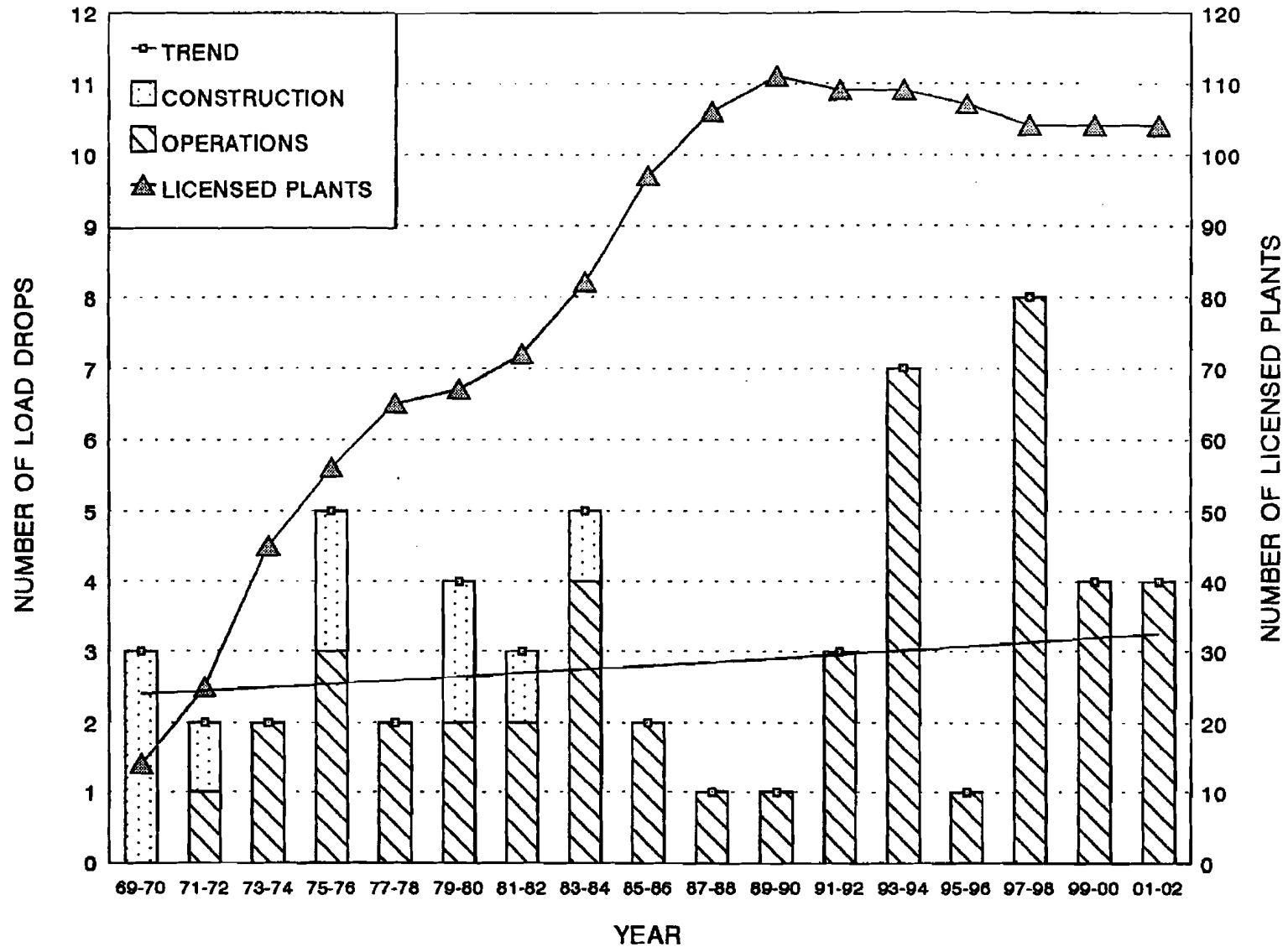
Safety Effect of Crane Events



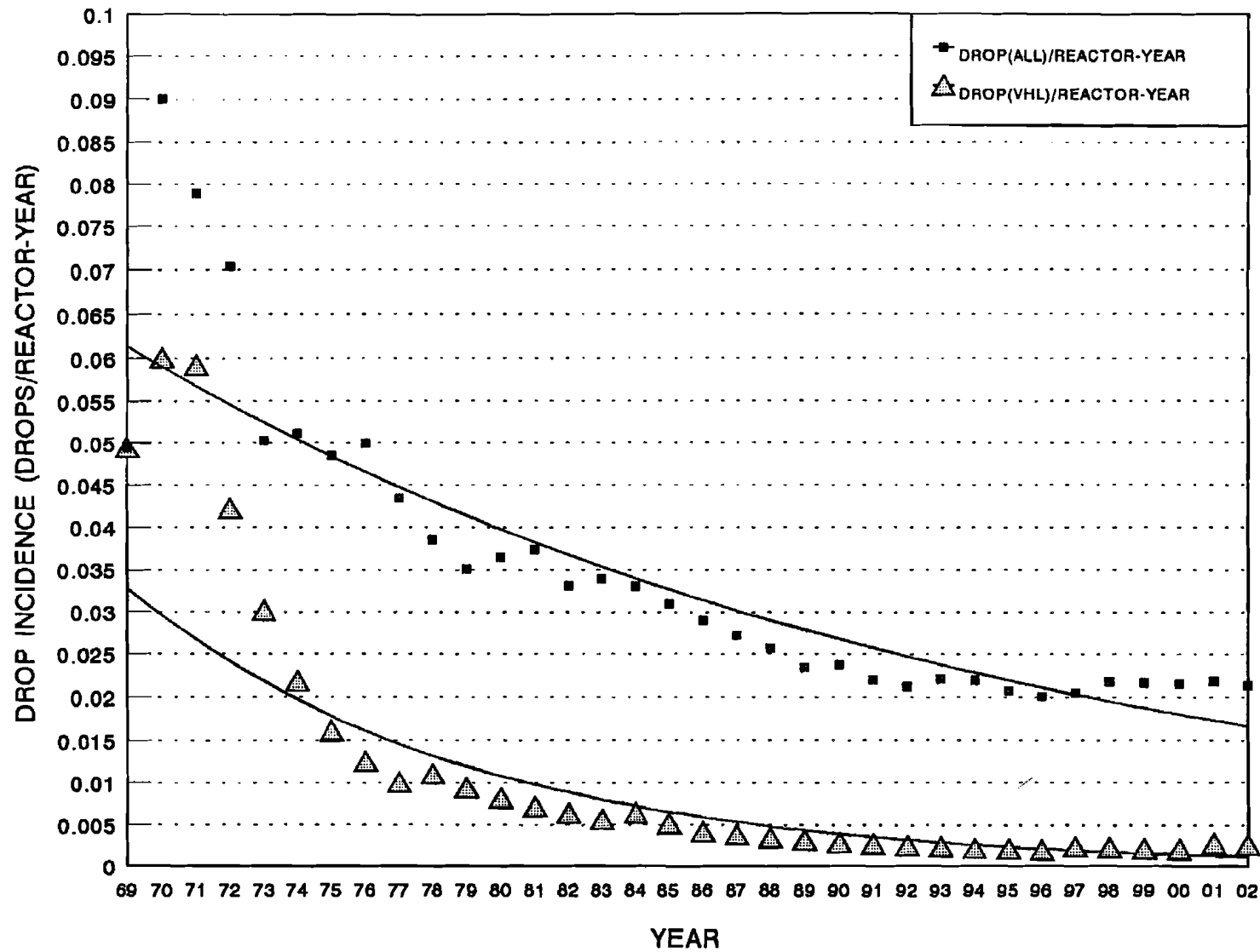
Load Slip Distribution



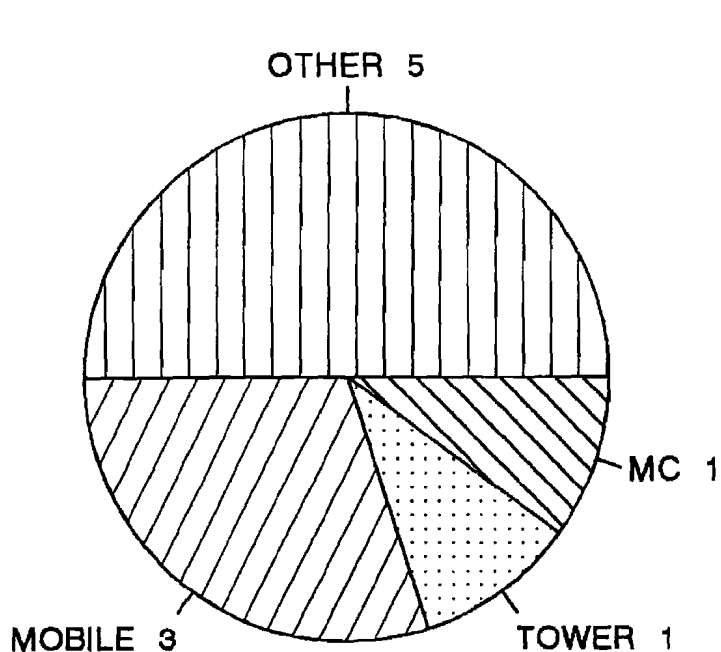
Load Drop Distribution



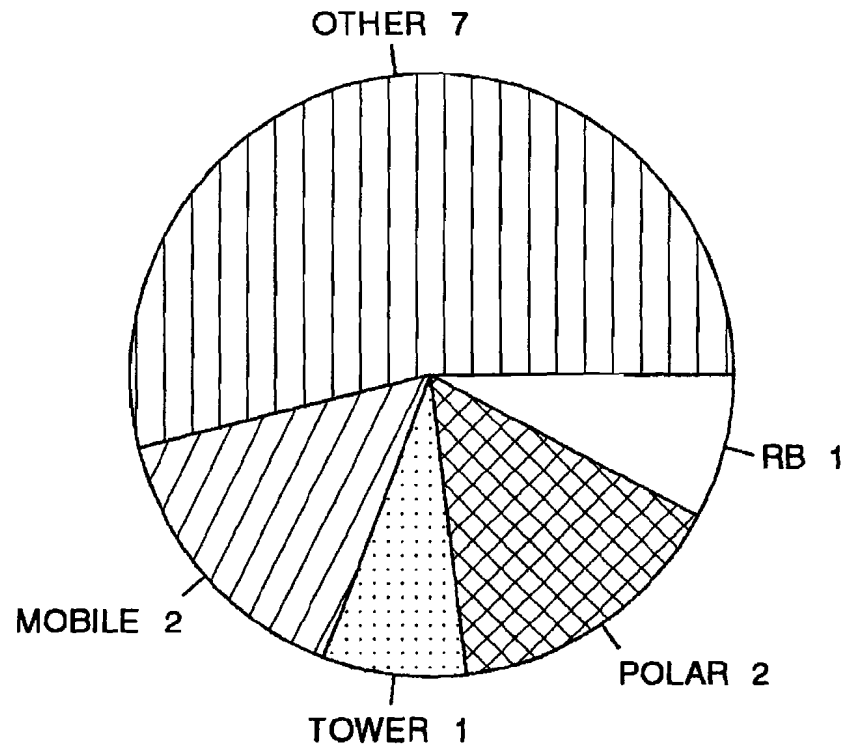
Load Drop Incidence Rate



Crane Types - Deaths and Injuries

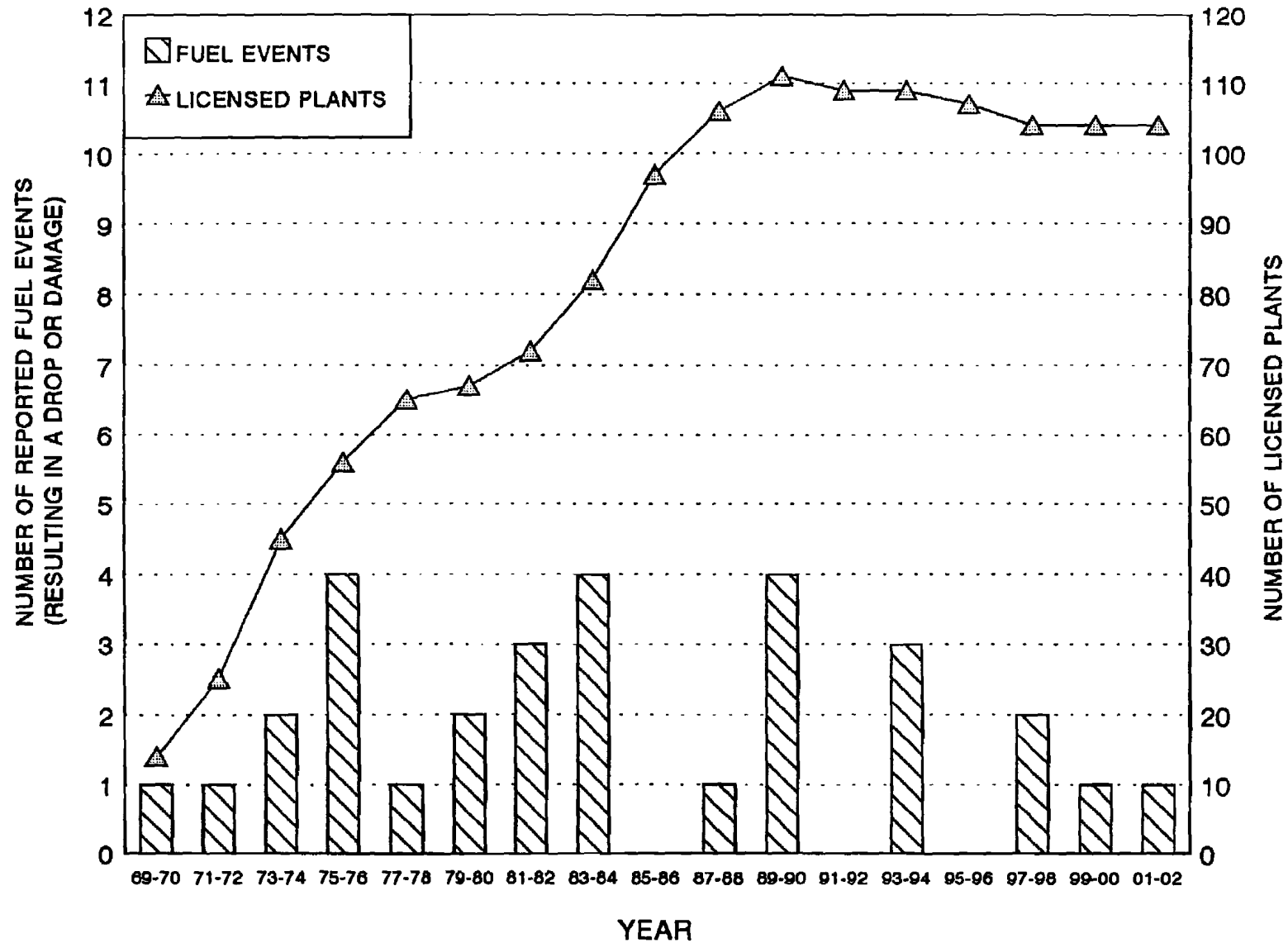


DEATH EVENTS

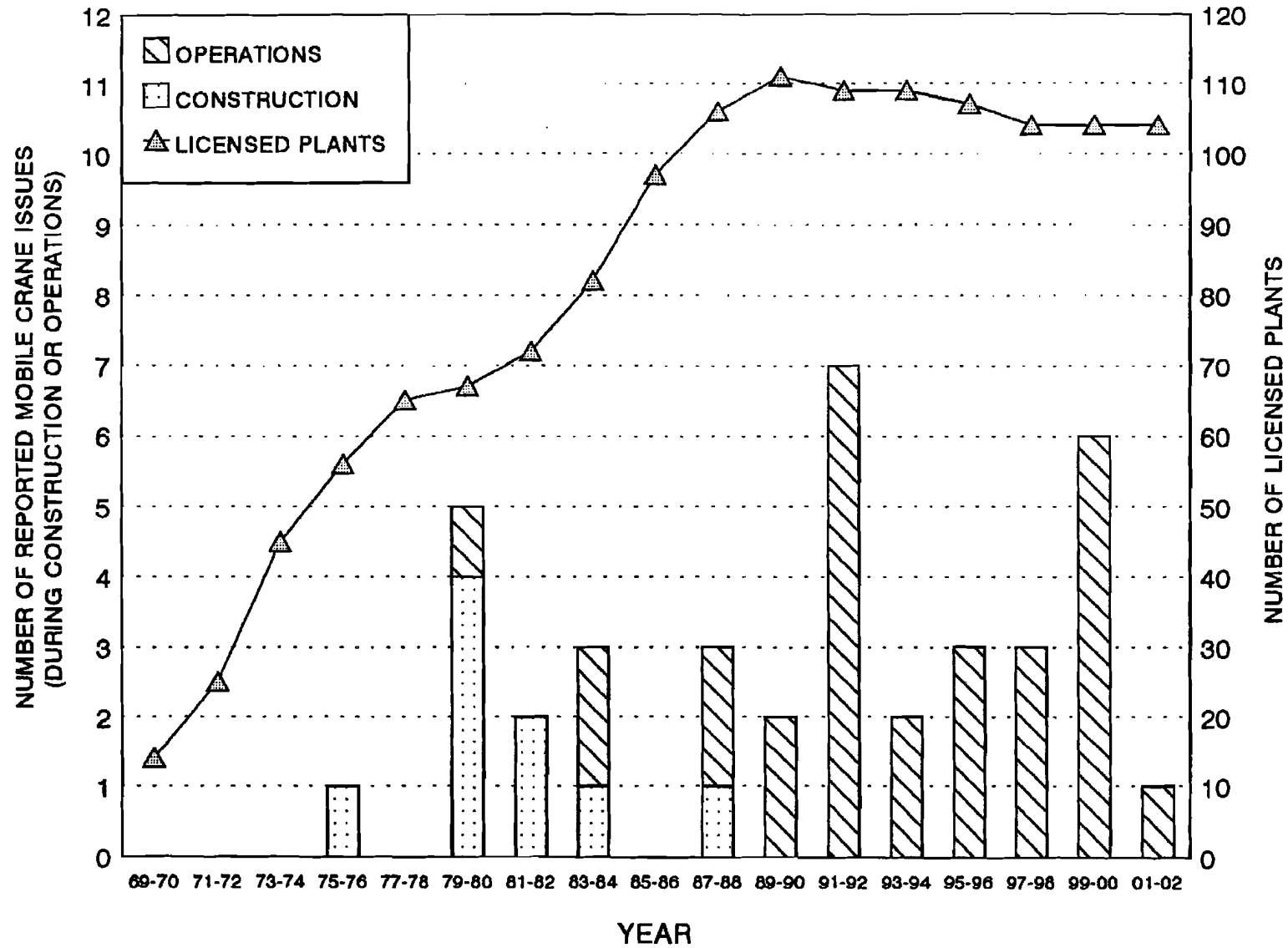


INJURY EVENTS

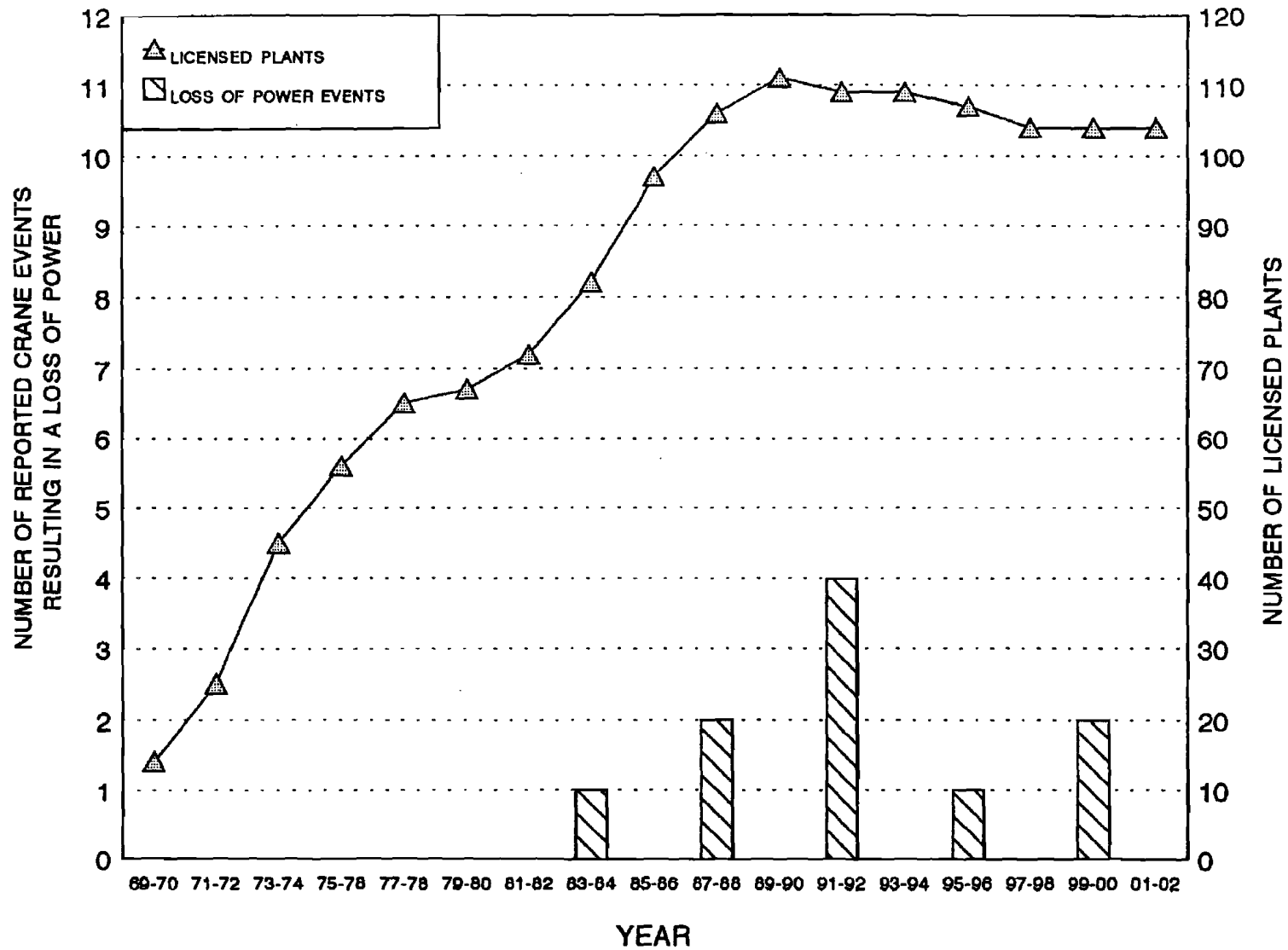
Distribution of Fuel Assembly Events



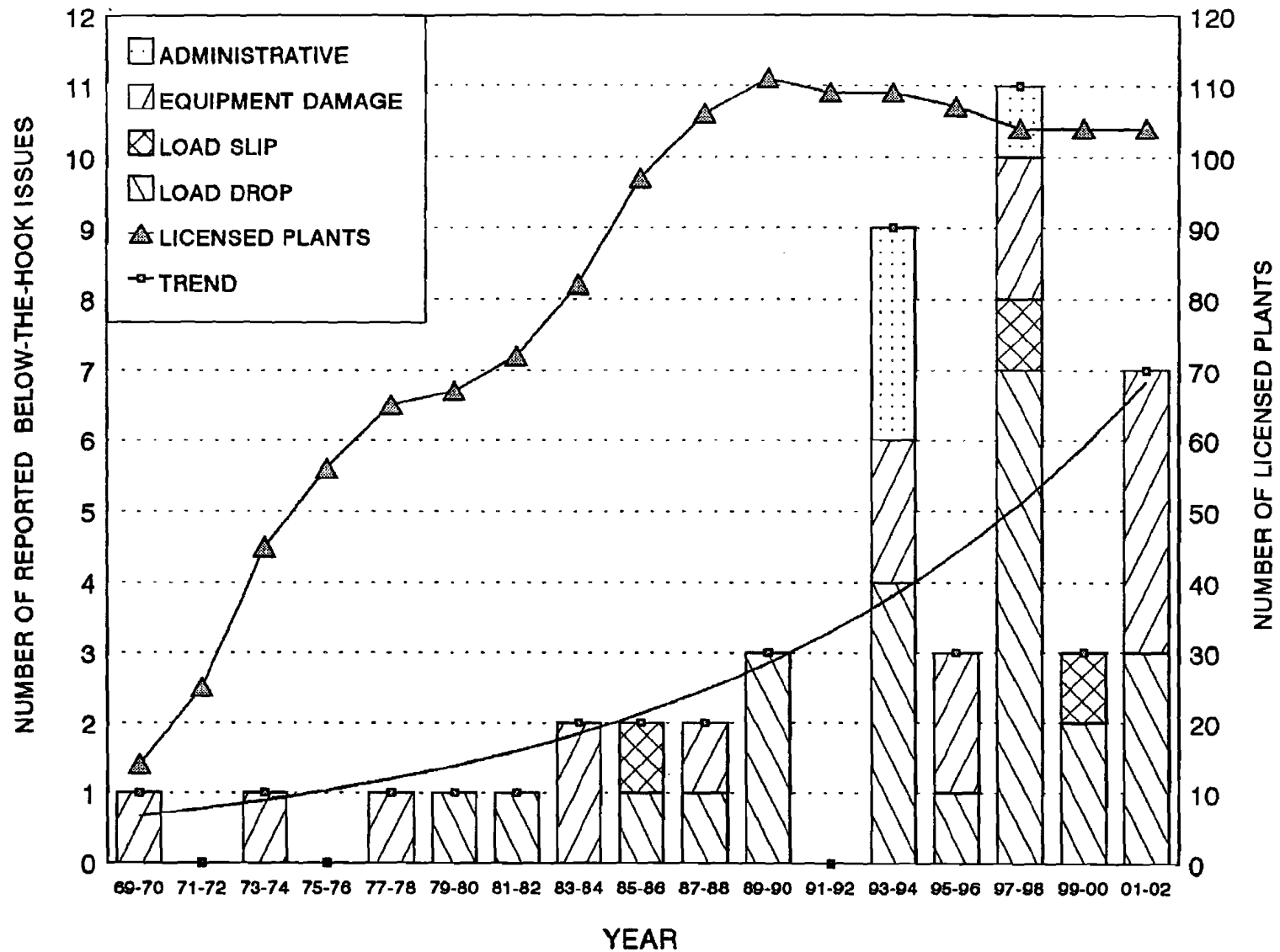
Distribution of Mobile Crane Events



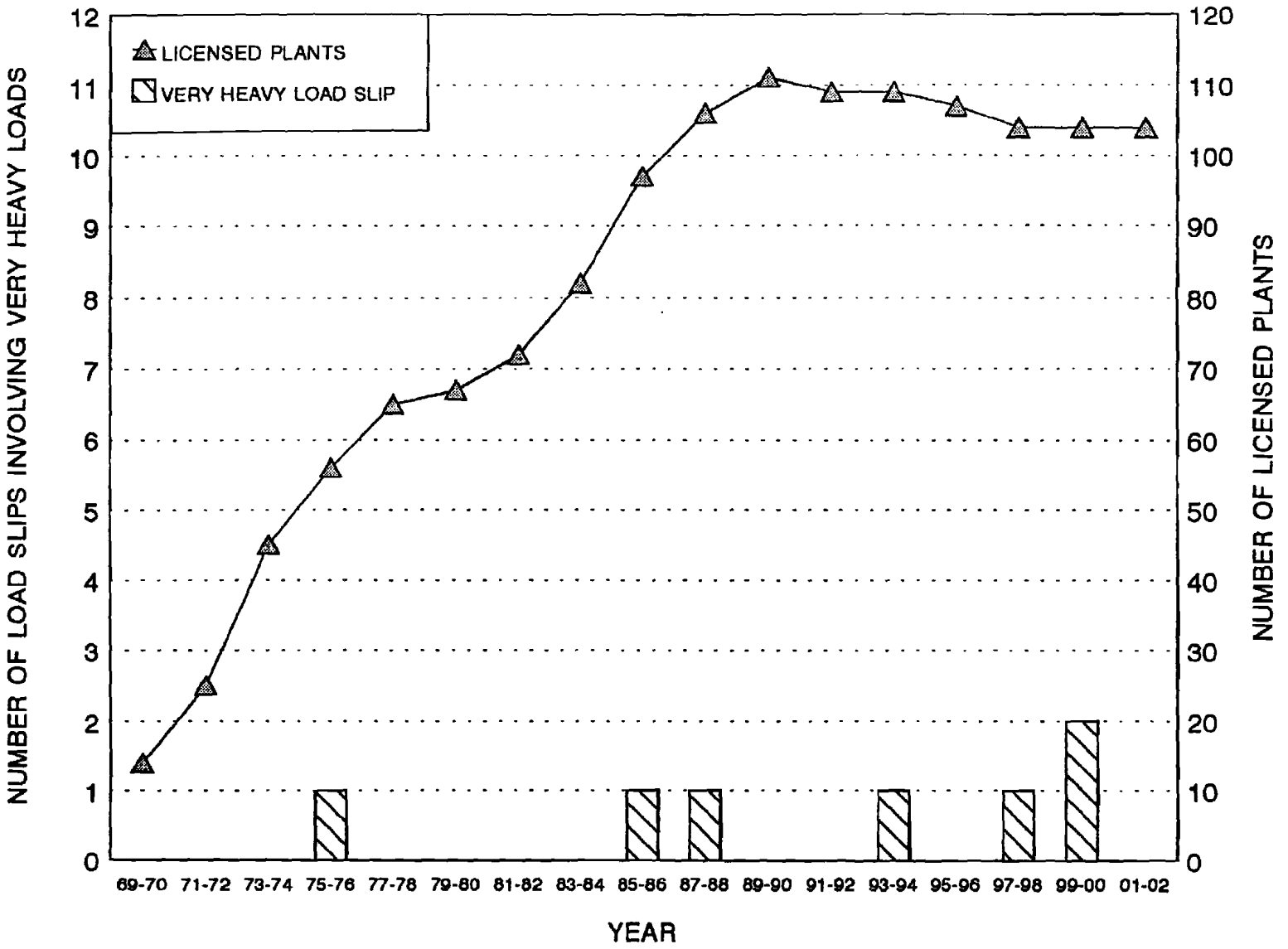
Loss of Power Crane Events



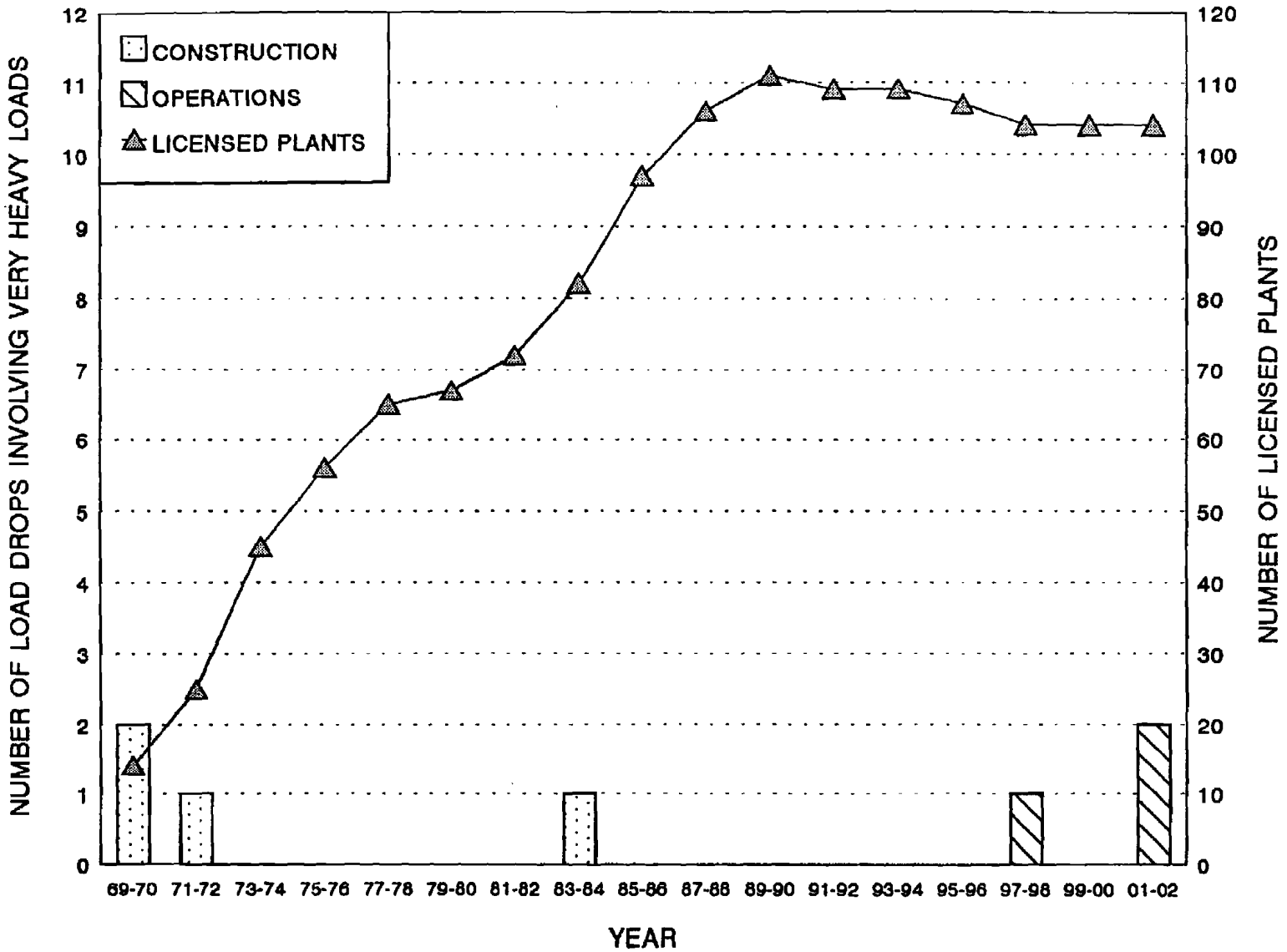
Below-the-Hook Crane Events



Very Heavy Load Slip Distribution



Very Heavy Load Drop Distribution



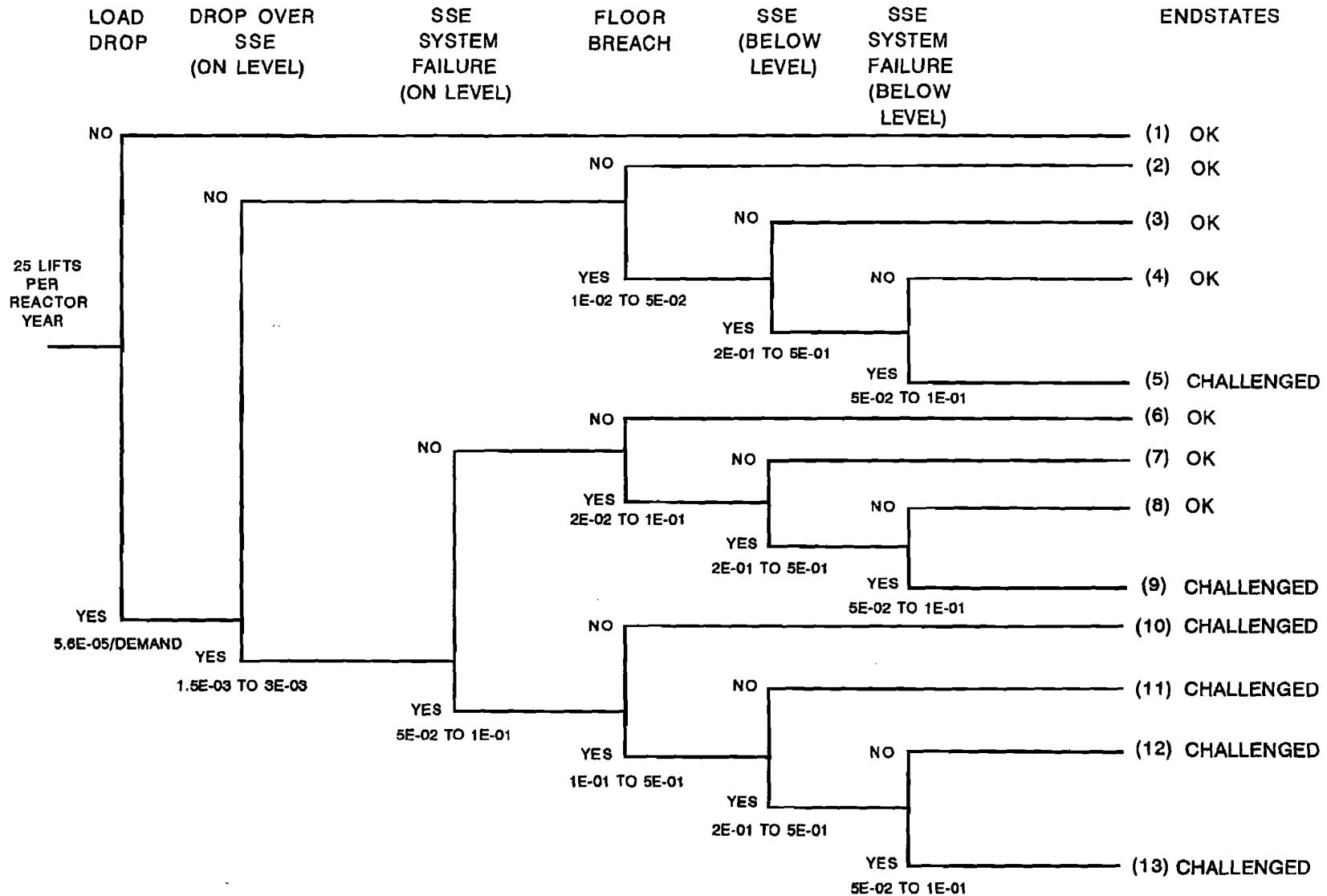
Very Heavy Load Drop Calculations

- **Load Drop Calculation Assumptions**
- **Load Drop Consequences**
- **Load Path Control Variations**

Single-Failure-Proof Crane

- **Crane Guidance Information**
- **Crane Classification Issues**
- **Single-Failure-Proof Crane Advantages**

Generic Load Drop Event Tree



Summary of Observations

- **Human Error Rate Significantly Increased**
- **Major Load Drops Occurred Outside Safety Related Areas**
- **Mobile Cranes - Loss of Power Events**
- **No ASP Crane Events**

Summary of Observations (Continued)

- **Below-the-Hook Events Significantly Increased**
- **Inconsistent Load Drop Calculation Methodologies**
- **Single-Failure-Proof Crane Classification Implementation**
- **29 Generic Communications on Cranes**

Regulation and Guidance Recommendations

- **Evaluate the Capability of Rigging Components**
- **Endorse ASME NOG-1 for Single-Failure-Proof Criteria**
- **Reemphasize NUREG-0612 Phase I Guidelines**
- **Evaluate the Need to Establish Standardized Calculation Methodologies**



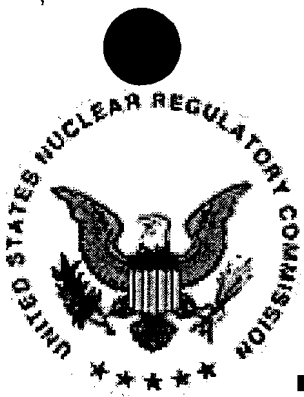
ABORD
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EXTENDED POWER UPRATE REVIEW STANDARD

NRR Briefing for

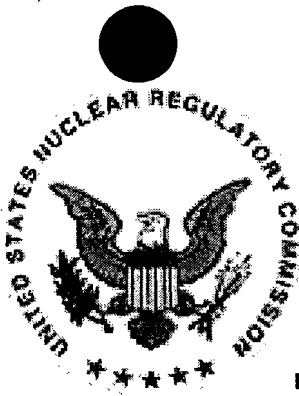
Advisory Committee on Reactor Safeguards

September 11, 2003



MEETING AGENDA

- **Opening Remarks**
- **Background**
- **Public Comments**
- **ACRS Comments**
- **Guidance for Independent Calculations**
- **Risk Evaluation**
- **Transient Testing**
- **Closing Remarks**

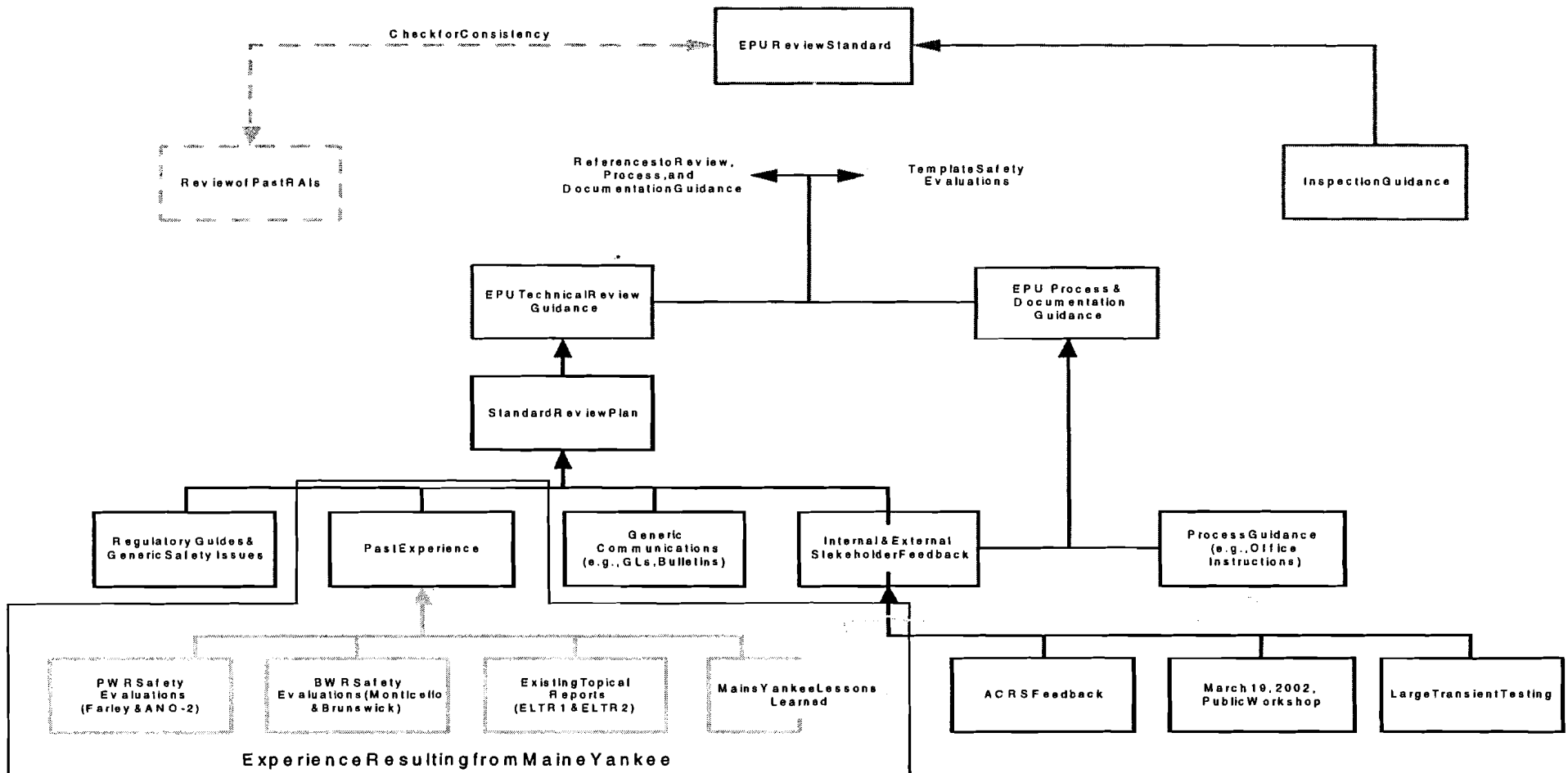


PURPOSE OF A REVIEW STANDARD

- **Provide:**
 - Comprehensive Guidance
 - Technical Review Criteria and Procedural Guidance
 - Updated Guidance
 - Mechanism for Retention of Institutional Knowledge
- **Increase Effectiveness and Efficiency of Reviews by:**
 - Implementing NRR's Vision for Centralized Work Planning
 - Improving Focus, Consistency, Completeness, and Thoroughness of Reviews
- **Improve Documentation of Reviews**



DEVELOPMENT OF RS-001





CONTENTS OF RS-001

REVIEW STANDARD FOR
EXTENDED POWER UPDATES



CONTENTS OF RS-001

Covers:

*Technical Review
Environmental Assessment
Proprietary Review
Noticing in Federal Register*

Provides Flowchart for Process

Identifies Procedural Guidance

**SECTION 1
PROCEDURAL GUIDANCE**

**SECTION 2
TECHNICAL REVIEW GUIDANCE**

**SECTION 3
DOCUMENTATION OF REVIEW**

**SECTION 4
INSPECTION GUIDANCE**



CONTENTS OF RS-001

Areas of Review

Acceptance Review Checklist

Responsible NRR Review Branches

Guidance Documents

Guidance for Independent Analyses

**SECTION 2
TECHNICAL REVIEW GUIDANCE**

**SECTION 3
DOCUMENTATION OF REVIEW**

**SECTION 4
INSPECTION GUIDANCE**



CONTENTS OF RS-001

Standardize Format and Content

Provide Regulatory Evaluation and Conclusion for Each Area of Review

Technical Evaluation Provided After Review

Consistent with NRR Guidance

**SECTION 3
DOCUMENTATION OF REVIEW**

**SECTION 4
INSPECTION GUIDANCE**



CONTENTS OF RS-001

Inspection Procedure for Power Upgrades

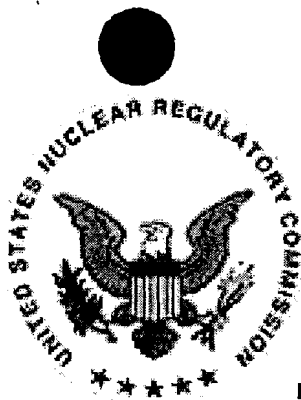
*Documentation Highlights Recommended
Areas for Inspection*

**SECTION 4
INSPECTION GUIDANCE**



PUBLIC COMMENTS

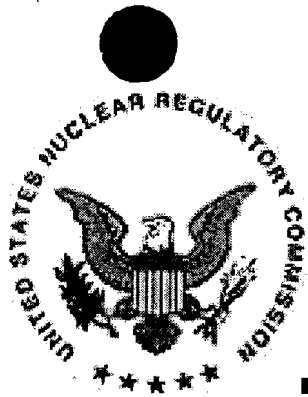
- **Draft RS-001 Issued December 31, 2002**
- **Public Comment Period Closed on March 31, 2003**
- **Received Three Comment Letters**
 - STARS (March 28, 2003)
 - NEI (March 31, 2003)
 - Framatome ANP (May 2, 2003)



PUBLIC COMMENTS

Summary

- **Backfit/Plant-Specific Licensing Bases**
- **Burden of Completing Matrices**
- **Need for Independent Calculations**
- **Use of Precedent**
- **Impact on NRC Approved Topical Reports**
- **Control of Future Changes to RS-001**
- **Pilot Initial Use**



PUBLIC COMMENTS

Summary - Continued

- **NRC Management Oversight**
- **Acceptance Review (“Sufficient Detail”)**
- **Evaluate Resulting Review Cost/RAI Savings**
- **Need for Review of Non-Licensed Plant Staff Training**
- **Stand-Alone References Section**
- **Establishing Standard Application Format**
- **NRC Fee-Billing Practices**



ACRS COMMENTS

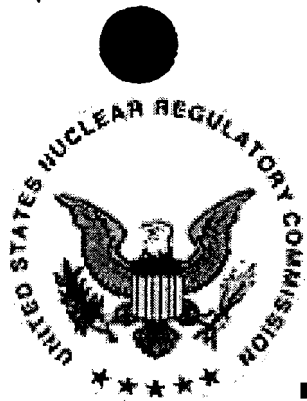
- **ACRS Letters on Past EPU Reviews**
 - Duane Arnold (October 17, 2001)
 - Dresden and Quad Cities (December 12, 2001)
 - Clinton (March 14, 2002)
 - ANO-2 (March 14, 2002)
 - GE CPPU Topical Report (April 17, 2002)
 - Brunswick (May 10, 2002)



ACRS COMMENTS

Summary

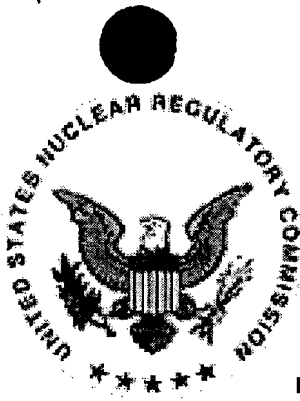
- **Important Areas**
 - Reduction in Time Available for Operator Actions
 - Irradiation-Assisted Stress Corrosion Cracking of Internals
 - Flow-Accelerated Corrosion
 - Fatigue of Feedwater Piping
 - Containment Response
 - Local Power Oscillations
 - ATWS and ATWS Recovery



ACRS COMMENTS

Summary – Continued

- **Documentation**
- **Communication with Inspection Staff**
- **Standard Review Plan**
- **Transition Reload Safety Analyses**
- **Need for More Detailed Thermal/Hydraulic Models**
- **Guidance for Independent Calculations**
- **Risk Evaluation**
- **Transient Testing**



ACRS COMMENTS

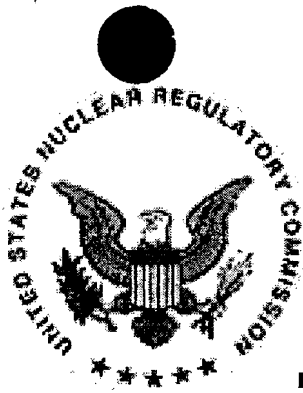
- **NRR Staff Presented the Review Standard to the ACRS Subcommittee on Thermal-Hydraulic Phenomena on August 19, 2003.**
- **Subcommittee Members Provided Several Comments and Suggestions During the Presentation**



ACRS COMMENTS

Summary

- **Dryer Failure at Quad Cities**
- **Effects of Increased Flow on Effectiveness of Noblechem Application**
- **Combined Effects of Increased Flow (FIV) & Increased Flux (Fluence) on IASCC**
- **Need to be Aware of New Information in Materials Area and Update Guidance as Necessary**
- **Effects of EPU on Consequences of Severe Accidents**



ACRS COMMENTS

Summary - Continued

- **What Limits Power Uprates and How Does LBLOCA Redefinition Affect these Limiting Factors**
- **“Synergistic Effects” → “Safety Margins and Impact of Plant Changes on Margins”**
- **Guidance for Independent Calculations**
- **Risk Evaluation**
- **Transient Testing**



ACRS COMMENTS

Guidance for Independent Calculations

- **Confidence in Models/Methods**
- **Confidence in Results**
- **Familiarity with Models/Methods**
- **Prior Use of Models/Methods**
- **Experience with Prior Use of Models/Methods**
- **Experience with Impact of Proposed Changes**
- **Available Margin Versus Level of Uncertainty**
- **Review Efficiency Gains**



ACRS COMMENTS

Risk Evaluation

- **Use of Human Reliability Models Not Approved by the NRC**
- **Ability of PRAs to Model Margin Reduction**
- **Level of Review of Risk Information/PRA Quality**
- **RG 1.174 Interpretation Issues**



ACRS COMMENTS

Transient Testing

- **Guidance Calls for Performance of Transient Testing**
 - Considers Original Power Ascension Tests
 - Focuses on EPU Related Modifications
- **Guidance Acknowledges that Licensees May Propose Alternative Approaches**
 - Provides Supplemental Guidance for Evaluation of Alternative Approaches
- **Guidance Places Responsibility on Licensees to Justify Proposed Alternative Approaches**



United States Nuclear Regulatory Commission

**Regulatory Guide 1.82, Rev. 3
“Water Sources for Long-Term
Recirculation Cooling Following A
LOCA”**

**Dr. T. Y. Chang
Division of Engineering Technology
Office of Nuclear Regulatory Research
US Nuclear Regulatory Commission**

**Dr. Bruce Letellier
Probabilistic Risk Analysis Group
Los Alamos National Laboratory**

Sept. 11, 2003



United States Nuclear Regulatory Commission

OVERVIEW

- Background
- Reason for Issuing Rev. 3 and Use of RGs
- RG 1.82, Rev. 3 Activities
- Key Revisions in RG 1.82, Rev. 3
- Resolution of Public Comments on DG-1107
- Summary of RG 1.82
- RES Future Activities (GSI-191)



United States Nuclear Regulatory Commission

Background

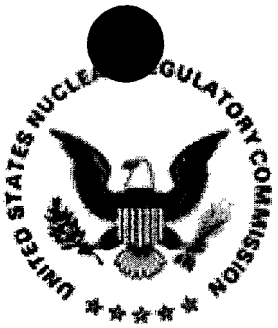
- Revision 0 – Issued June 1974
 - NPSH Calculations Based on 50% Blockage of Sump Screen
- Revision 1 – Issued November 1985
 - Guidance Based on USI A-43 Resolution
- Revision 2 – Issued May 1996
 - Revised Guidance for BWRs
 - Requested Licensee to Implement Measures to Ensure ECCS Functions Following LOCA (NRC Bulletin 96-03)
- Revision 3 – Issue September 2003 (Planned)
 - Revised Guidance for PWRs (GSI-191)



United States Nuclear Regulatory Commission

Reason for Issuing Rev. 3 and Use of RGs

- Contributes to resolution of GSI-191
- RG 1.82 is revised to enhance the debris blockage evaluation guidance for PWRs and to provide guidance of methods acceptable to the staff.
- Research after issuance of Rev. 2 indicated that Rev. 2 was not comprehensive enough to ensure adequate evaluation of a PWR's susceptibility to the effects of debris blockage of debris interceptors.
- RGs are not substitutes for regulations, and compliance is not required.
- Alternative methods different from those in RGs can be proposed and will be considered by the staff for acceptance.



United States Nuclear Regulatory Commission

RG 1.82, Rev. 3 Activities

- Briefed ACRS – 2/03
- Issued DG -1107 For Public Comment – 2/03 to 4/03
- Resolved Public Comments
- Briefed ACRS T-H Subcommittee 8/20/03, CRGR 8/26/03
- Brief ACRS Full Committee 9/11/03
- Resolve Comments
- Issue RG 1.82, Rev. 3 in 9/03



United States Nuclear Regulatory Commission

Key Revisions In RG 1.82 Rev.3

- Primarily, PWR Sections Revised to Enhance Debris Blockage Evaluation Guidance
 - Consistent with BWRs Guidance in Rev.2, and,
 - Insights gained from Research Performed Under GSI -191
- Changes to BWR Sections
(To be Consistent with PWR Sections in RG 1.82, Rev.3, and Staff's Position in Safety Evaluation on BWROG's Utility Resolution Guidance (URG) for ECCS Suction Strainer Blockage, 1998)
- Includes Guidance Previously Provided in RG 1.1, "Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal System Pumps"



United States Nuclear Regulatory Commission

Resolution of Public Comments on DG-1107

- 89 Comments received
- Comments were from 4 utilities, Westinghouse, NEI and 1 individual
- Comments and concerns raised most frequently
 - Conformance Issue for current plants (13)
 - Containment Pressure for Design of ECCS (8)
 - Screen Mesh Size (4)
 - Leak-Before-Break for Debris Source (4)
 - Partially Submerged Screens and Failure Criteria (4)
 - Basis for 1/8" Thin Bed Value (3)
 - Adequate Protection from Missiles (3)
 - Use of CFD and Other Methods for Debris Transport Calculation (2)



United States Nuclear Regulatory Commission

Summary of RG 1.82

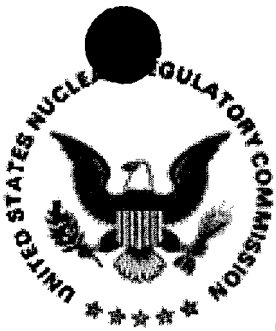
- Debris Sources and Generation
- Debris Transport
 - Airborne Debris Transport
 - Washdown Debris Transport
 - Sump Pool Debris Transport
- Sump-Screen Head Loss



United States Nuclear Regulatory Commission

Debris Sources and Generation (C.1.3.2)

- For debris generation calculations, a number of LOCAs of different sizes and locations should be postulated to provide assurance that the most severe postulated LOCAs are calculated.
- Level of severity corresponding to postulated break should be based on potential head loss incurred across the sump screen.
- “Zone of Influence” (ZOI) can be used to estimate amount of debris generated by a postulated LOCA.
- In some designs, postulation of break locations in main steam (MS) and main feedwater lines (MF) may be needed to determine the most limiting conditions for sump operation.
- All potential debris sources should be considered within the ZOI.



United States Nuclear Regulatory Commission

Debris Sources and Generation (Con.)

- As a minimum, break locations should be at:
 - RCS (and MS, MF if needed from licensing basis) with the largest amount of potential debris within the postulated ZOI
 - Large breaks with 2 or more different types of debris within the expected ZOI
 - Breaks in areas with the most direct path to sump
 - Medium and large breaks with the largest potential particulate to insulation ratio by weight
 - Breaks that generate fibrous debris that could create the “thin-bed effect” at sump screen



United States Nuclear Regulatory Commission

Debris Transport (C.1.3.3)

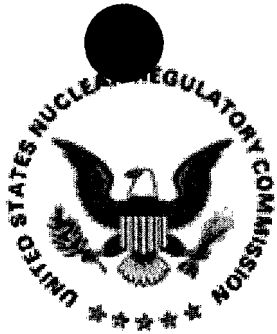
- Debris transport analyses should consider each type of insulation and debris size.
- 3 types of debris transport should be considered for debris sources to the sump screen: airborne, washdown, and sump pool debris transport.
- In lieu of performing analyses for airborne, washdown and sump pool debris transport, it could be assumed that all debris will be transported to the sump screen.
- If all drains leading to the sump could become blocked or inventory holdup could happen with debris on screen, the consequence could be worse than 100% transport, and should be assessed.



United States Nuclear Regulatory Commission

Debris Transport (Con.)

- Containment sump pool debris transport should include: (1) debris transport during pool fill-up phase and recirculation phase; (2) the turbulence in the pool caused by the flow of water, water entering the pool from break overflow, and containment spray drainage; and (3) buoyancy of the debris.
- Debris should be considered in the sump pool transport analyses are: (1) debris that would float along the pool surface; (2) debris that would remain suspended due to pool turbulence; and (3) debris that readily settles to the pool floor.
- CFD simulation in combination with the experimental debris transport data is an acceptable approach to predict debris transport within the sump pool. Alternative methods are acceptable provided they are supported by adequate validation of analytical techniques using experimental data to insure that the debris transport estimates are conservative with respect to the quantities and types of debris transported to the sump screen.



United States Nuclear Regulatory Commission

Sump-Screen Head Loss (C.1.3.4)

- For fully submerged sump screens, NPSH available to ECC pumps should be determined using the conditions specified in the plant's licensing basis.
- For partially submerged sumps, Appendix A of this guide states that NPSH margin may not be the only failure criterion. In this case, credit should only be given to the portion of sump screen that is expected to be submerged as a function of time. Pump failure should be assumed to occur when the head loss across the sump screen is greater than $\frac{1}{2}$ of the submerged screen height or the NPSH margin.
- Estimates of head loss caused by debris blockage should be developed from empirical data based on the sump screen design, postulated combination of debris, and its approach velocity. The thin-bed effect on head loss should be considered.



United States Nuclear Regulatory Commission

RES Future Activities (GSI-191)

- Near Term (before 10/03)
 - Cal-Sil Head Loss Test Report
 - Chemical Test Report
- Long Term (up to 9/04)
 - Debris Sample Characterization for PWRs
 - Additional Head Loss Tests
 - HPSI Throttle Valve Clogging Issue
 - International Workshop, Feb/March 2004, Albuquerque, NM
- All RES activities scheduled to be completed by end of FY 04

1
2













Regulatory Guide 1.53 Rev 1 Single Failure Criterion

Presentation to
Advisory Committee on Reactor Safeguards
September 12, 2003



Satish Aggarwal
Office of Nuclear Regulatory Research
301-415-6005

Single Failure Criterion

- Draft RG DG-1118 was issued in 2002 for public comment.
- Received 4 comment letters.
- Made few minor changes in the implementation section:
 - Backfitting is not intended for current operating nuclear power plants

Single Failure Criterion

- Draft DG-1118:

Licensees of Operating Nuclear Power Plants will have the option to use for safety system modifications.

1. The June 1973 issue of RG 1.53 and be subjected by the staff on a case-by-case basis; or
2. This revision 1

Single Failure Criterion

- Final RG:

It will also be used to evaluate the submittals from the operating reactor licensees who voluntarily propose to initiate safety system (or protection system) modifications, if there is a clear nexus between the proposed modifications and this guidance for applying single failure criterion.

Single Failure Criterion

- What is a “Single Failure?”

The safety systems shall perform all required safety functions for a DBE in the presence of:

- Any single detectable failure within the safety systems.
- All failures caused by the single failure.
- All failures that cause or are caused by the DBE requiring the safety function.

Single Failure Criterion

- Single Failure:
 - The single failure could occur prior to, or at any time during, the DBE for which the safety system is required to function.

Single Failure Criterion

- Single-Failure analysis in designs using digital computers:
Reference to another IEEE Std was added (IEEE Std 7-4.3.2 – 1993).

ACRS MEETING HANDOUT

<p>Meeting No.</p> <p>505</p>	<p>Agenda Item</p> <p>15</p>	<p>Handout No.:</p> <p>15.1</p>
<p>Title PLANNING & PROCEDURES/ FUTURE ACRS ACTIVITIES</p>		
<p>Authors</p> <p>JOHN T. LARKINS</p>		
<p>List of Documents Attached</p> <p>PLANNING & PROCEDURES MINUTES</p>		<p>15</p>
<p>Instructions to Preparer</p> <p>1. Paginate Attachments Punch holes Place Copy in file box</p>	<p>From Staff Person</p> <p>JOHN T. LARKINS/</p>	

INTERNAL USE ONLY

G:PlanPro(ACRS):pp.mins.505
Sept. 12, 2003

SUMMARY MINUTES OF THE ACRS PLANNING AND PROCEDURES SUBCOMMITTEE MEETING September 10, 2003

The ACRS Subcommittee on Planning and Procedures held a meeting on September 10, 2003, in Room T 2 B3, Two White Flint North Building, Rockville, Maryland. The purpose of the meeting was to discuss matters related to the conduct of ACRS business. The meeting was convened at 8:15 a.m. and adjourned at 10:00 a.m.

ATTENDEES

M. Bonaca
G. Wallis
S. Rosen

ACRS STAFF

J. T. Larkins
S. Bahadur
H. Larson
R. P. Savio
S. Duraiswamy
S. Meador
M. Sykes
R. Caruso

1) Review of the Member Assignments and Priorities for ACRS Reports and Letters for the September ACRS meeting

Member assignments and priorities for ACRS reports and letters for the September ACRS meeting are attached (pp. 7-11). Reports and letters that would benefit from additional consideration at a future ACRS meeting were discussed.

RECOMMENDATION

The Subcommittee recommends the assignments and priorities for the September ACRS meeting as shown in the attachment (pp. 7-11).

2) Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through November 2003 is attached (pp. 7-11). The objectives are to:

- Review the reasons for the scheduling of each activity and the expected work product and to make changes, as appropriate:
- Manage the members' workload for these meetings
- Plan and schedule items for ACRS discussion of topical and emerging issues

During this session, the Subcommittee will also discuss and develop recommendations on items included in Section II of the Future Activities List (pp. 12-13).

RECOMMENDATION

The Subcommittee recommends that the members provide comments on the anticipated workload. Changes will be made, as appropriate. The Committee should decide on the Subcommittee's recommendations on items in Section II of the Future Activities List.

3) Meeting with the NRC Commissioners

The ACRS is scheduled to meet with the NRC Commissioners between 9:30 and 11:30 a.m. on Thursday, October 2, 2003, to discuss items of mutual interest. Topics approved by the Commission for this meeting are as follows:

I Overview (MVB)

- Risk-informing 10 CFR 50.46 and proposed 10 CFR 50.69
- License renewal activities
- Review of AP 1000 designs
- Preapplication review of ESBWR design
- Power uprate review standard
- Future ACRS activities

II Advancement of PRA technology in risk-informed decisionmaking (TSK)

III Materials Degradation Issues (JDS)

IV Reactor oversight process (WJS)

Time has been scheduled on Friday, September 12 at 9:30 - 11:15 a.m. for Committee discussion of these topics. Draft viewgraphs will be provided to the members for this discussion. The viewgraphs to be used by the members in their presentations need to be sent to the Commission on September 19.

RECOMMENDATION

The Subcommittee recommends that the Committee agree on what will be presented to the Commission and the content of the members viewgraphs.

4) ACRS Review of Power Uprates

A draft letter from Ledyard Marsh (NRR) to John Larkins is attached proposing that the ACRS consider not reviewing a proposed 6 percent stretch power uprate for the Kewanee Nuclear Power Plant (KNPP) (pp.14-15). The draft letter describes the power uprate history related to completed plant modifications, and the additional plant modifications needed to support the proposed uprate. The staff is requesting an ACRS decision as soon as reasonably feasible to facilitate the staff's allocation of resources and scheduling of its review.

The ACRS has as a matter of established practice been reviewing power uprates of 5 percent or more. The Committee may want to reconsider this in view of its current workload and the existence of a Standard Review Plan for power uprate reviews. The NRC staff has been informed that the ACRS will consider its review of power uprates of 5 percent or more on a case-by-case basis, based on NRC staff requests such as was provided for KNPP is a possibility. The ACRS staff will separately provide the Planning and Procedures Subcommittee with an analysis of all proposed uprates and identify any unique aspects of the uprate that merit Committee attention.

RECOMMENDATION

The Subcommittee recommends that the ACRS not review the proposed power uprate for KNPP and that the ACRS/ACNW Executive Director so inform the NRC staff. The Subcommittee will consider future staff recommendations whether or not to review proposed power uprates and make decisions on a case-by-case basis.

5) NRC Staff Analysis of the Alvarez Paper on Spent Fuel Pool Vulnerabilities

The ACRS members have been provided with a package containing the Alvarez paper on spent fuel pool (SFP) vulnerabilities, the NRC staff response to this paper, and an article from the August 25, 2003, edition of NEI's "Nuclear Energy Overview" (copies of the Alvarez paper and NRC response were previously sent to the members when these documents were made available). The topic is likely to generate continued controversy. The ACRS Subcommittee on Safeguards and Security discussed SFP vulnerabilities on July 9, and the ACRS will discuss SFP vulnerabilities on September 10, 2003, and

plans to write a report on this subject during the September 10-13, 2003, ACRS meeting.

RECOMMENDATION

None. The ACRS is considering this information in its review of SFP vulnerabilities.

6) Switchyard Initiated Scrams

Graham Leitch has recommended that the NRC staff brief the ACRS on the operating experience with switchyard initiated scrams during which the staff should address the following guidelines:

- Are the recent switchyard initiated scrams indicative of a statistically significant event and are these scrams a safety concern?
- Does the staff believe that aging issues or changes in utility substation operating or maintenance practices are factors in these failures?
- What actions does the staff plan to take?

Mr. Leitch's August 2, 2003, e-mail to the members is attached (p. 16).

Related to this matter, RES issued a report on grid reliability titled, "Operating Experience Assessment - Effects of Grid Events on Nuclear Power Plant Performance," on May 1, 2003. The members have been sent copies of this RES report.

For the Committee's information Chairman Diaz has been appointed to a joint US-Canada Working Group that will search for the cause of the August 14 power outage. The Task Force will be chaired by Energy Secretary Abraham and his Canadian counterpart, Natural Resources Minister Dhaliwal. Sam Collins is also a member of this Working Group. A network announcement related to this Working Group is attached (p.17). Please note that NRC activities related to the August 14 power outage or to grid issues are to be coordinated through the Office of the Chairman.

RECOMMENDATION

The Subcommittee recommends that a briefing on switchyard initiated scrams be scheduled at the earliest opportunity and that the ACRS schedule a briefing on the RES report on grid reliability after coordination with the Office of the Chairman.

7) October 20-22, 2003, NSRC Agenda

A copy of the agenda for the October 20-22, 2003, Nuclear Safety Research Conference meeting is attached (pp. 18-24) for the ACRS members information.

RECOMMENDATION

The Subcommittee recommends that ACRS members who wish to attend inform Ms. Meador as soon as possible to facilitate early FY 04 planning of travel expenditures.

8) Near-Term ACRS Safeguards and Security Schedules

A list of and schedules for proposed near term ACRS Safeguards and Security activities is attached (p. 25). These are based on our current knowledge as to when NRC staff work products will be available and projections of ACRS workload. This list includes having the ACNW take the lead responsibility for the NRC staff's work on RDDs and related modifications to the MACCS code. Plans for FY 04 and FY 05 ACRS activities, reflecting what was learned in the ACRS September 10, 2003, discussions, will be discussed during the October 2003 Planning and Procedures Subcommittees. A schedule for the NRC staff's near-term force-on-force exercises is also attached (p. 26).

RECOMMENDATION

The Subcommittee recommends that the ACRS approve the proposed list and schedule for near term ACRS safeguards and security activities.

9) Followup from the July 2003 Meeting with the EDO

The following items may require additional action by the ACRS:

- Regarding the views on ROP, the NRC staff continues to believe that the PI thresholds are providing necessary information for informed decisions and appropriate actions.
- The EDO staff will develop a suitable mechanism to track the progress of commitments made by NRC staff in response to the ACRS recommendations.
- The EDO will notify the ACRS when there are changes in commitments made to the Committee.

RECOMMENDATION

The Subcommittee recommends that the ACRS/ACNW Executive Director keep the Committee informed of the actions he decides to take.

10) Dr. Lewis Comments on Probability and History

Dr. Lewis provided Dr. Bonaca with the comments contained in the attached e-mail (pp. 27-28) and suggested discussion by the ACRS.

RECOMMENDATION

The Subcommittee recommends that the Subcommittee on Reliability and Probabilistic Risk Assessment discuss Dr. Lewis' comments and the staff's work in the Accident Sequence Precursor Program. The October 9, 2003, Joint meeting of the Subcommittees on Reliability and Probabilistic Risk Assessment and Human Factors will provide an opportunity.

11) ACRS Evaluation of RES Programs

The Office of Nuclear Regulatory Research has been charged by the NRC's EDO to establish a process to evaluate the effectiveness/utility of its programs. This evaluation is mandated from the Government Results and Performance Act and needs to be in place during the next fiscal year. Mike Mayfield has requested that Dr. Larkins discuss this matter with the ACRS and assess whether or not the Committee has an interest in evaluating RES Programs in a more quantitative manner than it does presently in its biannual report on the research program. If the ACRS is interested, then Mayfield will meet the Committee during the Planning and Procedures session and discuss this matter.

RECOMMENDATION

The Subcommittee has asked Mr. Mayfield to meet with the ACRS during Friday's session discussing the report of the Planning and Procedures Subcommittee and recommends that during this discussion the ACRS consider what actions it will take.

12) Member Issues

- George Apostolakis proposes to have the NRC staff brief the ACRS on current agency activities related to Safety Culture and assess whether another letter on this matter would be appropriate (e-mail p. 29). George Apostolakis also recommends that the ACRS be briefed on NRC activities related to Digital Instrumentation and Control (p. 30). The Planning and Procedures Subcommittee notes that both of these matters will be discussed during the October 9, 2003, joint meeting of the Subcommittees on Reliability and Probabilistic Risk Assessment and Human Factors.
- The ACRS/ACNW office staff maintains files containing the documents that identify areas where members may have conflicts of interests regarding their involvement in Committee reviews. To facilitate the identification of conflicts of interest that arise from new work that members become involved in between their yearly filings with the OGC, Dr. Bahadur plans to conduct periodic e-mail surveys of all of the members

ANTICIPATED WORKLOAD SEPTEMBER 10-13, 2003

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Apostolakis	--	Snodderly	Draft final Regulatory Guide DG-1122 on PRA quality	B	To support the staff schedule	Draft
		Nourbakhsh	Review of PIRT Process (Briefing by Dr. Nourbakhsh)	--	--	--
Bonaca	All Members	Larkins	Preparation for meeting with the Commissioners (October 2)	--	--	--
	Leitch	Jain/Duraiswamy	Final Review of St. Lucie License Renewal Application	A	To meet the CTM schedule	Draft
Kress	Bonaca	Savio/Major	Interim Report on Safeguards and Security Issues [Spent Fuel Pool Vulnerabilities and other issues of interest to the ACRS]	A	To identify issues of concern to the ACRS	Draft
Ransom	Wallis	Caruso	Draft final NRC Review Standard for Review of Core Power Uprate Requests	A	To meet the CTM schedule	Draft
Rosen	--	Sykes	Subcommittee Report on Fire Protection Issues	--	--	--
Shack	--	Snodderly	Proposed Revision to Reg. Guide 1.53, Single Failure Criteria	Report as Needed	--	--
Sieber	--	Weston	Proposed Resolution of GSI-186, Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants	A	To support staff schedule	--

**ANTICIPATED WORKLOAD
SEPTEMBER 10-13, 2003**

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Wallis	Ransom	Caruso/EI-Zeftawy	Draft final Reg. Guide DG-1107, Water Sources for Long-Term Recirculation Cooling Following a LOCA	A	To support staff schedule	--

ANTICIPATED WORKLOAD OCTOBER 1-4, 2003

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Apostolakis	Bonaca	Savio/Major	Safeguards & Security Subcommittee Report - RI vulnerability Assessment and RI Decisionmaking	--	--	--
Bonaca	All Members	Larkins	Meeting with the NRC Commissioners. (October 2, 9:30-11:30 a.m.)	--	--	--
	Leitch	Sykes/Duraiswamy	Fort Calhoun License Renewal Application	A	To support the staff schedule	--
Ford	--	Jain	Materials Degradation Program	(Report as needed)	--	--
Kress	--	El-Zeftawy	Interim review of the AP1000 design	A	To identify issues of concern to the ACRS	--
Leitch		Weston	Recent Operating Events	-	--	-
	Bonaca	Jain/Duraiswamy	Subcommittee Report - H.B. Robinson License Renewal Application [Subcommittee Mtg on 9/30]	-	-	-
	Rosen	Weston	RES Report on Effects of Grid Events on Nuclear Power Plant Performance (1985-2001)	(Report as needed)	--	--

9

ANTICIPATED WORKLOAD

OCTOBER 1-4, 2003 (CONT'D)

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Powers		Nourbakhsh/ Duraishwamy	Discussion of ACRS Report on the NRC Safety Research Program	--	--	--
		Caruso	Subcommittee Report - Reactor Fuels Subc. Mtg 9/29-30	--	--	--
Sieber	--	El-Zeftawy	Draft Final Regulatory Guide 1.168, Verification and Validation of Digital I&C Systems	A	To support the staff schedule	--

ANTICIPATED WORKLOAD NOVEMBER 5-8, 2003

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Apostolakis	Bonaca	Savio/Major	Interim Report on Safeguards and Security Issues (RI Vulnerability Assessment and Decisionmaking)	A	To identify issues of concern to the ACRS	--
Kress	--	El-Zeftawy/Snodderly	Advance Reactors Framework	(Report as needed)	--	--
		Weston	Proposal Resolution of GSI-189, "Susceptibility of Mark III Containments to Early Failure From Hydrogen Combustion During a Severe Accident"	A	To support the staff schedule	--
		El-Zeftawy	Early Site Permit Review Standard.	(Report as needed)		
Leitch	Bonaca	Sykes	Subcommittee Report - Ginna License Renewal Application (Subc. Mtg. 11/4/03)	--	--	--
Powers		El-Zeftawy	Part 26 Fitness for Duty Rule	Potential Larkinsgram	--	
		Nourbakhsh/ Duraishwamy	Discussion of ACRS Report on the NRC Safety Research Program	--		--
		Weston	Mixed Oxide Fuel Fabrication facility	A	To support the staff schedule	
Rosen		El-Zeftawy	SRP Chapter 18, Human Factors Engineering	A	To support the staff schedule	--
Shack		Snodderly	Effectiveness of USI-A45 Resolution (Decay Heat Removal)	(Report as needed)	--	--

Items Requiring Committee Action

1 **Proposed Reactor Power Uprates* For: Kewanee (6%)** (Open)

Member: Graham Wallis **Engineer:** Ralph Caruso

Estimated Time: 1 hour

Purpose: Determine a Course of Action

Priority:

Requested by: NRR M. Shuaibi

Staff will request that ACRS make a determination whether it wants to review the power uprate review request for Kewanee. This is a 6% uprate, which is just slightly above the current benchmark value of 5% that the staff/ACRS have been using to determine whether the Committee should involve itself in an uprate review. Staff would like to propose to the Committee that for uprates like this one, where there is some question about whether there should be Committee involvement, or not, it will prepare a brief letter to the Committee, discussing the significance of the uprate, whether it involves a significant change to the plant, and whether it believes that Committee involvement is warranted. It would like to have the Committee respond to this proposal at the September, 2003 meeting.

The Planning and Procedures Subcommittee recommends that Dr. Wallis propose a course of action

2 **Draft Final Regulatory Guide DG-1099, " Anchoring Components And Structural Support In Concrete "** (Open)

Member: Dana Powers **Engineer:** Bhagwat Jain

Estimated Time:

Purpose: Determine a Course of Action

Priority:

Requested by: RES Herman Graves

This regulatory guide is issued to provide guidance to licensees and applicants on methods acceptable to the NRC staff for complying with NRC regulations in the design, evaluation, and quality assurance of anchors used for components and structural supports on concrete structures. This revision of the regulatory guide reflects incorporation of comments received during the public comment period. The staff has provided a copy of this regulatory guide on September 5, 2003, and requests ACRS review during the October 2003 full Committee meeting.

The Planning and Procedure Subcommittee recommends that Dr. Powers propose a course of action.

12

3 **Draft 10 CFR Part 52 Construction Inspection Program Framework**

(Open)

Member: Stephen Rosen **Engineer:** Med El-Zeftawy

Estimated Time: 2 Hours

Purpose: Determine a Course of Action

Priority:

Requested by: ACRS J. Isom

The NRC staff plans to reactivate the revision effort for the construction inspection program (CIP) that was suspended in 1994. This effort will include: (1) review and revisions of applicable inspection manual chapters (IMC) to address changes in the regulatory environment, specifically the application of risk information; and (2) development of the associated inspection guidance for inspection of critical attributes for advanced reactor designs. In the past, the NRC divided the CIP into four phases. The inspection guidance for these four phases was contained in the following IMCs:

IMC 2511-- "Light-water Reactor Inspection Program--Pre-CP Phase"

IMC 2512-- "Light-water Reactor Inspection Program--Construction Phase"

IMC 2513-- "Light-water Reactor Inspection Program--Pre-operational Testing and operational preparedness Phase"

IMC 2514-- "Light-water Reactor Inspection Program--Startup Testing Phase"

The objectives of the CIP revision are to address programmatic weaknesses in the NRC construction inspections that had been identified during the licensing of several plants and to develop an inspection program to meet the needs of advanced reactor designs. The NRC staff issued a draft document for public comment regarding this matter. The public comment period will end on September 15, 2003. The NRC staff would like the ACRS to review such document during the October 1-4, 2003 ACRS meeting.

The Planning and Procedures Subcommittee will discuss this matter and propose a course of action.

13



NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

DRAFT

MEMORANDUM TO: John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards and
Advisory Committee on Nuclear Waste

FROM: Ledyard B. Marsh, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - ADVISORY COMMITTEE
ON REACTOR SAFETY REVIEW OF STRETCH POWER UPRATE
AMENDMENT (TAC NO. MB9031)

The purpose of this memorandum is to request the Advisory Committee on Reactor Safeguards (ACRS) consider not reviewing the stretch power uprate proposed by the Kewaunee Nuclear Power Plant (KNPP) licensee. Below are the details regarding the KNPP stretch power uprate and the staff's recommendation.

The staff has defined three categories for power uprates: measurement uncertainty recapture (MUR), stretch, and extended power uprates (EPU). MUR power uprates are less than 2 percent and are based on the use of more accurate feedwater flow measurement techniques. Stretch power uprates are uprates that do not require major modifications. Stretch power uprates usually involve changes to instrumentation setpoints. EPUs are uprates that require major modifications to the plant and usually require significant modifications to major balance-of-plant equipment such as the high pressure turbines, condensate pumps and motors, main generators, and/or transformers.

By application dated May 22, 2003, Nuclear Management Company, LLC (the licensee), requested an amendment to the KNPP Operating License and Technical Specifications (TSs) to increase the licensed rated power by 6.0 percent from 1673 megawatts thermal to 1772 megawatts thermal (ADAMS Accession No. ML031540080).

Based on its review of this application, the staff has categorized it as a stretch power uprate. The basis for this categorization is the limited modifications required for the plant to achieve the requested power level. The modifications required to achieve the stretch power uprate at KNPP are as follows:

- (1) Modification of the valve trim in the feedwater control valve,
- (2) Replacement of the high-pressure turbine outer cylinder horizontal joint bolting to accommodate the higher loading conditions, and
- (3) Replacement of the low-pressure turbine-to-jackshaft and low-pressure turbine-to-generator coupling bolts with higher strength material.

Item 4

14

The licensee replaced steam generators (SGs) in 2001. When the licensee replaced the SGs, it selected and installed replacement SGs with sufficient capacity to achieve the requested power uprate.

On April 4, 2003, the staff approved an application by the licensee for the use of 422 VANTAGE+ nuclear fuel with PERFORMANCE+ features (ADAMS Accession No. ML030940276). As part of the review for the 422 VANTAGE+ nuclear fuel, the staff has already reviewed many of the licensing-basis analyses at the higher power level. Therefore, the review for the power uprate application for such analyses is conducted only to ensure that the previously approved analyses remain valid.

On July 8, 2003, the staff approved an amendment to revise the KNPP Operating License and TSs to increase the licensed rated power by 1.4 percent from 1650 megawatts thermal to 1673 megawatts thermal using MUR (ADAMS Accession No. ML031530734).

The staff is currently reviewing, under a separate effort, the use of an upgraded computer code for design-basis accident containment integrity analyses called "Generation of Thermal-Hydraulic Information for Containment (GOTHIC) version 7.0p2 (GOTHIC 7)." The staff's review of the containment analyses using the GOTHIC 7 code is still in progress. The staff is conducting independent calculations to support its review in this area.

Based on the established ACRS review threshold of 5 percent, the ACRS could require that it review the current KNPP stretch power uprate request. However, the staff believes that the 5-percent threshold was originally established to (1) differentiate between power uprates within the design capacity of the plant and more complex power uprates with more important changes and potentially higher impacts on the plant and (2) ensure that the ACRS has an opportunity to review the more complex power uprates. Based on this, and based on the staff's determination that the KNPP power uprate request is for a 6-percent stretch power uprate with minor modifications, the staff requests the ACRS to consider not reviewing the stretch power uprate proposed by the KNPP licensee. To adequately schedule the staff's resources and review, we request the ACRS provide its decision regarding review of the KNPP stretch power uprate as soon as reasonably feasible.

Docket No. 50-305

From: <GMLeitch@aol.com>
To: <mvbonaca@snet.net>, <JDSIEBER@aol.com>, <dapower@sandia.gov>, <graham.b.wallis@dartmouth.edu>, <wjshack@anl.gov>, <historyart@computron.net>, <TSKress@aol.com>, <FPCTFord@aol.com>, <apostola@mit.edu>, <ransom@ecn.purdue.edu>, <MWW@nrc.gov>, <RPS1@nrc.gov>, <HJL@nrc.gov>, <JTL@nrc.gov>, <MME@nrc.gov>, <SXD1@nrc.gov>, <SXB@nrc.gov>, <hpn@nrc.gov>, <RXC@nrc.gov>
Date: 8/2/03 2:12PM
Subject: Switchyard Initiated Scrams

Colleagues,

During a recent 7 day period there have been 3 scrams from 100% power at large nuclear units caused by switchyard or grid problems. These scrams challenge both safety systems, non safety systems, as well as the operators. None of these scrams resulted in equipment damage, but there were complications in some cases.

We have discussed previously what appeared to be a trend, but concluded that we needed more data. Based on an admittedly non scientific look at this most recent data, these 3 scrams appear to indicate a continuing, and perhaps increasing trend in switchyard initiated scrams. The total number a scrams for all causes does not appear to be increasing, but the percentage and absolute number caused by switchyard equipment does appear to be increasing. (Switchyard equipment is that beyond the main generator and includes transformers, buswork, circuit breakers, disconnect and ground switches, lightning arrestors, protective relays associated with this equipment, and grid stability issues.)

This type of scram challenges the plant because the initial event is the opening of the main generator breaker at full power. In this situation many systems have to operate properly to prevent plant complications and equipment damage including even a destructive turbine overspeed.

Based on this most recent data, I recommend that the P and P consider asking the staff to make a presentation to the full ACRS addressing the following questions:

- 1) Is there a statistically significant trend?
- 2) Does this represent a safety concern?
- 3) Is there an aging issue?
- 4) Has there been a change in utility substation operating or maintenance practices?
- 5) What actions, if any, does the staff plan?

Tabulated below are the 3 scrams to which I refer:

Peach Bottom #2 7/22/03 Main generator protective relay actuation. Group 1 isolation. HPCI and RCIC used to control level.

Palo Verde #2 7/28/03 Grid perturbation. Sounds to me like switching problem at nearby substation. I think they were close to tripping all 3 units.

Salem #1 Unusual Event. 500kv Circuit Breaker failure.

I'd be happy to hear any thoughts you have on this issue.

Shelton P.

Item 6

From: Network Announcement
To: Network Announcement
Date: 8/29/03 3:10PM
Subject: The Nuclear Working Group of the U.S.-Canadian Joint Power System Outage Task Force

Please direct replies to Gary Holahan (GMH).

The Nuclear Working Group of the U.S.-Canadian Joint Power System Outage Task Force

As you may be aware, Chairman Diaz has been appointed to the Nuclear Working Group of the U.S.-Canadian Joint Power System Outage Task Force, which continues to address the nuclear power plant issues relevant to the August 14 blackout. The group was created because nuclear power facilities are substantial contributors to the Nation's electrical grid, particularly in the areas affected by the blackout.

The group's efforts include two phases. The first, currently underway, will assist in determining the cause of the power outage by reviewing the sequence of events for each nuclear power plant in the area affected. It also will determine if any of these events caused or contributed to the blackout. Additionally, the working group will evaluate potential nuclear power plant safety issues during and following the power outage.

During the second phase, the task force will review design features, operating procedures, and the regulatory requirements of nuclear power facilities that could be modified to enhance safety and grid reliability.

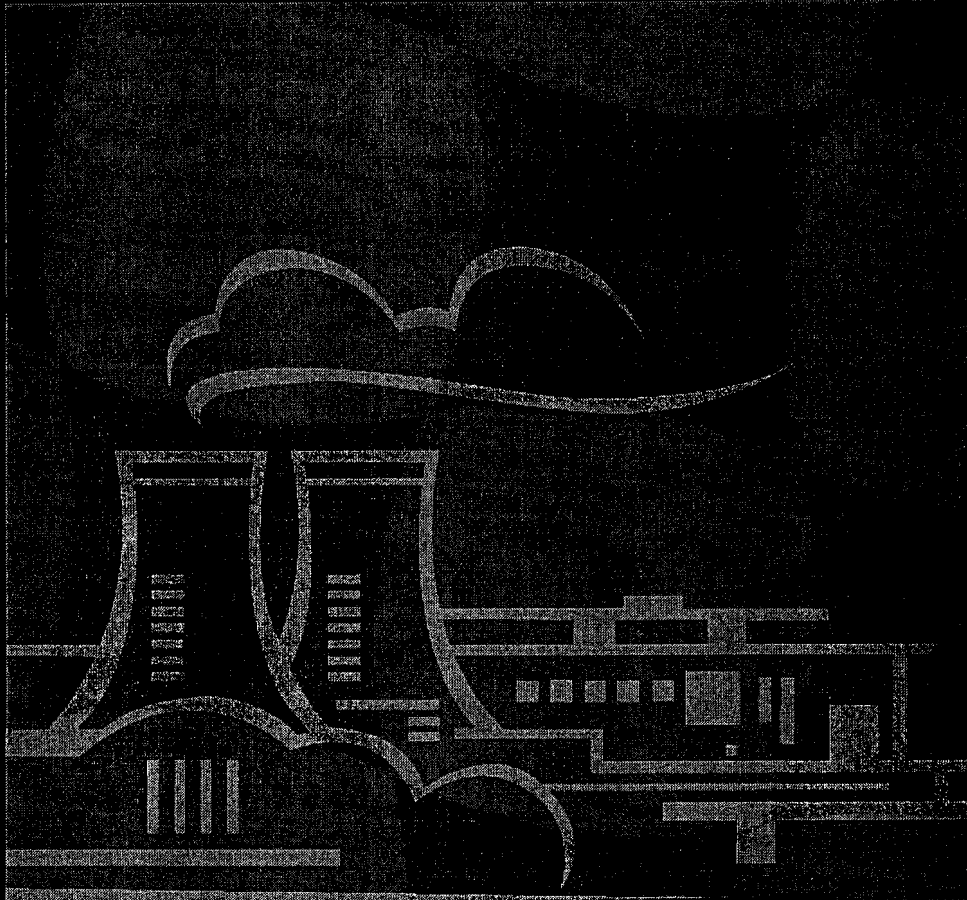
Other Nuclear Working Group members include Samuel Collins, the NRC's Deputy Executive Director for Reactor Programs, Linda Keen, President & CEO of the Canadian Nuclear Safety Commission (CNSC), James Blyth, Director General, Reactor Power Regulation of CNSC, Bill Magwood, Director of DOE's Office of Nuclear Energy, and representatives of the affected States and provinces.

As the group's work proceeds, it is essential that any NRC activities related to the power outage or to grid issues in general be communicated with and coordinated through the Office of The Chairman. All agency reviews associated with the blackout, including special inspections at those plants affected during the blackout and potential generic communications, should complement related activities underway and be fully coordinated agencywide. In this way, we can assure that the task force members are kept informed of NRC grid-related activities. Samuel Collins, at sjc1@nrc.gov, and Gary Holahan, at GMH@nrc.gov, are available to provide assistance to ensure coordination and enhance communications in this effort.

It's 0

17

Organized by:
Office of Nuclear Regulatory Research
United States Nuclear Regulatory Commission
Washington, DC 20555



Nuclear Safety Research Conference

October 20-22, 2003
Marriott at Metro Center
Washington DC USA

*Item 7
18*

The Office of Nuclear Regulatory Research of the
U.S. Nuclear Regulatory Commission is hosting its annual
Nuclear Safety Research Conference (NSRC)

on October 20-22, 2003
at the Marriott at Metro Center
775 12th Street NW
Washington DC

We are planning an exciting program and welcome
your attendance and active participation.

Background and Purpose

The Office of Nuclear Regulatory Research (RES) of the U.S. Nuclear Regulatory Commission (NRC), has sponsored this conference every year since 1973.

The NSRC is an international conference focusing on regulatory issues and attracts researchers, regulators and utility representatives from the United States and more than twenty other countries. Participants at the conference are given the opportunity to interact with NRC staff and colleagues and obtain insights and results from research programs performed in support of the NRC's mission.

Conference Format

This year's agenda will include technical sessions on degradation of fuels and cladding materials, advanced reactors, operating experience evaluation, and decommissioning.

Panels of experts will discuss and invite questions on risk-informed regulation and realistic conservatism, knowledge management, and the present status and future directions of materials degradation.

Guest speakers and panelists will include NRC Chairman Nils J. Diaz, NRC Commissioners, and representatives from organizations, industries, government, the research community and public interest groups in the United States and abroad.

Daily **Poster Sessions** are planned to facilitate the presentation of additional technical material.

Conference Agenda (preliminary)

Monday October 20, 2003

Plenary Session

8:30-8:45 am

Opening Remarks

8:45-9:45 am

Keynote Speaker - Nils J. Diaz,
Chairman, NRC

10:00-12:00

Panel Discussion - **Risk-Informed
Regulation/Realistic Conservatism**

Objective: To discuss recent risk-informed initiatives, realistic analyses, and the use of conservatism in risk-informed regulation.

Panel members may include representatives from industry, the NRC, and international organizations, as well as public interest groups.

12:00-1:30 pm

Lunch

1:30-5:00 pm

Session 1 - Risk-informed Regulation/Realistic Conservatism (Anticipatory and Confirmatory Research Support/Safety, and Unclassified Security Case Studies)

Objective: To discuss recent advances in risk analysis methods and their application to risk-informed regulation.

Potential topics for presentation include

- PRA quality and risk-informed decision-making
- Applying PRA to resolve generic and material/waste issues
- Fire research program
- Risk-informed 10 CFR 50.46
- Assessment of possible NPP vulnerabilities to terrorist attacks and mitigation strategies (e.g., spent fuel pool analysis)

Tuesday October 21, 2003

Plenary Session

8:30-9:15 am

Commissioner Speech

9:30-12:30 pm

(Two concurrent sessions)

Session 2 - Decommissioning (9:30-11:00)

Objective: To discuss RES work underway that supports license decision-making in decommissioning by using more realistic tools, and rule-making on 1) controlling the disposition of solid materials, and 2) reactor entombment.

Potential topics for presentation include

- Controlling the disposition of solid materials
- Entombment
- Complex fate and transport modeling discussions

Session 3 - Advanced Reactors Session (9:30-12:30)

Objective: To present the latest research on advanced reactors, focusing on new and evolving safety or regulatory issues, and the infrastructure needed to form a sound technical basis for regulatory decisions.

Potential topics for presentation include

- Overview of advanced reactors - NRC and DOE
- Requirements for analytical codes and data
- Technology-neutral framework
- Generation IV concepts and technology: the challenges -- DOE

Session 4 - Behavior of Spent Fuel in Dry Casks (11:15 - 12:30)

Objective: To describe recent research results on fuel behavior under conditions expected in dry casks.

Potential topics for presentation include

- Cladding creep in high-burnup fuel under dry cask conditions
- Hydride redistribution and resulting embrittlement under dry cask conditions

12:30-2:00 pm

Lunch

2:00-5:00 pm

(Two concurrent sessions)

Session 5 - High-Burnup Fuel Behavior during Reactor Accidents

Objective: To describe recent research results on high-burnup fuel and on cladding alloys that have been introduced to achieve high burnups.

Potential topics for presentation include

- LOCA tests on high-burnup fuel
- Effects of niobium in cladding alloys under steam oxidizing conditions
- Deformation during reactivity transients
- Calculation of pulse width effects in reactivity transients
- Mechanical properties of cladding

Tuesday October 21, 2003 (cont'd)

Session 6 - Operating Experience Evaluation

Objective: To describe several studies wherein RES had a critical role in assessing operating experience and disseminating those findings to staff and the industry. Also, to present RES's major on-going involvement in reassessing NRC's current operating experience programs prompted by the head degradation incident at the Davis Besse plant.

Potential topics for presentation include

- Electrical grid study
- Mitigating systems performance index
- Boron dilution tests/PKL
- Davis Besse "lessons learned" / safety culture
- Operating Experience Task Force
- Industry performance trend methods (ASP, IIIEI)

Wednesday October 22, 2003

Plenary Session

8:30-9:15 am

Commissioner Speech

9:30-10:30 am

Panel Discussion - **Knowledge Management**

Objective: To discuss various techniques of gathering and using tacit knowledge from expert personnel in the nuclear power field and the benefits thereof. Various aspects of data preservation also will be discussed. The panel will focus on "what" should be preserved, "how" to collect the knowledge, and "which" technology to use to store and make it available in the future.

Panel members may include representatives from the NRC, NASA, national laboratories, DOE, EPRI, and international organizations, such as the Nuclear Energy Agency.

10:45-12:30 pm Panel Discussion - **Materials Degradation; Present Status and Future Directions**

Objective: To describe the results of characterizing degradation mechanisms in reactor coolant pressure boundary materials, methodologies for their mitigation/repair, and actions planned for evaluating and managing such degradation.

Panel members may include representatives from international organizations, the government, industry, and utilities.

12:30-2:00 pm

Lunch

2:00-4:30 pm

Session 5 - Materials Degradation—Present Status and Future Directions

Potential topics for presentation include

- Analysis of the structural integrity of exposed clad in the Davis Besse corrosion cavity
- Development of a susceptibility model for predicting CRDM degradation
- Development of technologies for inspecting replacement heads
- NRC/Industry collaboration on problems of degradation

Conference Registration

The NSRC is open to the public, and there is no registration fee. However, registration for the conference is strongly encouraged.

Registration Form (Please Print)

Name: _____

Title: _____

Affiliation: _____

Address: _____

_____ Country: _____

Telephone: _____

Fax: _____

email: _____

Please indicate if:

- | | |
|--|---|
| <input type="checkbox"/> Speaker | <input type="checkbox"/> Panelist |
| <input type="checkbox"/> Session Chair | <input type="checkbox"/> Session Vice Chair |

Four easy ways to register:

1. Visit our web site www.bnl.gov/nsrc
2. Mail this registration form
3. Fax this registration form
4. e-mail the above registration information

Submit registration information before October 15, 2003 to:

Susan Monteleone, Conference Coordinator
Brookhaven National Laboratory
P.O. Box 5000, Building 130
Upton, New York USA 11973-5000
Tel. 1-631-344-7235
Fax. 1-631-344-3957
e-mail: susanm@bnl.gov

Hotel Reservations

A block of rooms has been reserved at the Marriott at Metro Center at the special conference rate of \$209 per night. Please contact the hotel directly to make room reservations and mention the "Nuclear Safety Research Conference". Reservations must be made by September 29, 2003, to receive the special rate.

Marriott at Metro Center

775 12th St., NW

Washington, DC 20005

Phone +1-800-228-9290 or +1-202-737-2200

Fax +1-202-824-6106

Transportation

The Washington D.C. area is serviced by three major airports, Ronald Reagan Washington National Airport (National), Washington Dulles International Airport (Dulles), and Baltimore-Washington International Airport (BWI). The Marriott Hotel, National Airport and other local hotels are conveniently reached via the METRO train. Car rentals are available at all three airports. Public transportation via the METRO is recommended.



Proposed Near-term Safeguards and Security Activities

September 2003

Complete ACRS report on SFP vulnerabilities during the September 10-13, 2003 ACRS meeting and discuss near-term S&S activities— Discuss ACNW taking the lead on the review of NRC activities related to RDDs and FY 04-05 MACCS code modifications to the ACNW and this proposed list of near term ACRS safeguards and security issues.

October 2003

Safeguards and Security Subcommittee report during the October 1-4, 2003 ACRS meeting---
George Apostolakis discusses the NRC staff's proposed position on guidance for RI vulnerability assessment and RI decision-making (staff paper due to the Commission by 9/31) and obtains feedback from the ACRS members in preparation for issuance of an ACRS report during the November ACRS meeting.
Mario Bonaca discusses planing of FY 04 and FY 05 ACRS safeguards and security activities

November 2003

Subcommittee meeting (about 1 day) the week of November 6-8 ACRS meeting (Safeguards and Security Subcommittee scheduled on November 5; Plant License Renewal Subcommittee moved to November 4)

Topics to be discussed

- Report on RI decision making and RI vulnerability assessment (George Apostolakis)
- Pilot plant studies and proposed mitigation strategies
- RES proposed research plan for FY 04-05

Complete ACRS report on RI decision making and RI vulnerability assessment during the November 6-8 ACRS meeting (George Apostolakis)

December 2003

Complete ACRS report on pilot plant studies/mitigation strategies and RES research plan during the December 4-6 ACRS meeting

George Apostolakis

25

From: Richard Major
To: ACNW-members; ACRS Members; Ruth Weiner
Date: 9/4/03 3:43PM
Subject: Force-on-Force Exercises

Folks

NSIR's Ralph Way called to let us know the schedule for up coming force- on-force exercises at a number of power plants. You are invited to attend as an observer. The exercises last an entire week. Mondays are a general overview of the process, interviews of guard force to test their understanding of use of deadly force, tours, and live fire exercises. Tues-Thur the actual exercises are run. Fri is exit interviews and lessons learned. Here is what is Scheduled

North Anna (Va) Sept 15-19
Calvert Cliffs (Md) Sept 29- Oct 3
South Texas (TX) Oct 20-24
Cooper (Ne) Oct 27-31
Diablo Canyon (Ca) Nov 17-21

If anyone is interested in attending one of these sessions or a part of one let me know and I will set things up.
Rich

CC: Howard Larson; Jenny Gallo; John Larkins; Ralph Way; Richard Savio; Sher Bahadur

Gentlemen, Let's talk about this note from Hal Lewis at the P&P Mario ----- Original Message -----
From: hal lewis **To:** mvbonaca@snet.net **Sent:** Friday, August 08, 2003 10:39 PM **Subject:**
probability and history
Mario:

Here's one the ACRS might consider for some long-overdue effort. First history.

The reporter who wrote the NY Times obit for Norm Rasmussen (a good guy I will miss) said that in 1982 the NRC sponsored an Oak Ridge study that estimated the (industry-wide) core-melt probability as 0.0023 per reactor year, much larger than the WASH-1400 estimate. I told the reporter (whom I know) that I had never heard such a number, and he dredged up an article he had written in 1982 that identified it. Well, one thing led to another, and Bill Lindblad tracked down a reference that identified it as an Accident Sequence Precursor study, recommended (Heaven forbid) by my own 1978 committee. To my surprise, such studies are still going on, being updated, and apparently making the same disqualifying mistakes of principle they made in the old days.

The relevant subject (to which I'll return) came up a few years ago at some NRC shindig at which I gave a talk in Bethesda (perhaps an anniversary of WASH-1400), with Dick Meserve, *inter alii*, in the audience. The point was that the staff has all these years been treating the influence of precursors on the estimates of core-melt probability by replacing the failure probability of the afflicted part or subsystem by 1.0, and otherwise leaving the PRA alone. This is just plain methodologically and conceptually wrong, but the point is sufficiently subtle that they don't seem to understand it. In my talk on that occasion I distinguished between the unanticipated failure of a part (or subsystem) and the occasions in which you deliberately take it out of service. In the latter case it is absolutely correct to use the existing PRA with assumed failure of that component or subsystem to predict the failure probability of a larger system. All you have done is to replace a fallible component with an already failed one. No problem there.

However, when something fails for other, usually unknown, reasons (as in the precursor events), it is dead wrong to assume that you have learned nothing about the reliability of everything else, and equally wrong to assume that the failed part is a bummer. It is therefore dead wrong, in principle, to take the old PRA and substitute a failure probability of 1.0 for a failed part. Example. I have bad piston rings in my car, generating lots of unburned fuel and carbon, and eventually a spark-plug gums up and fails. It would be dead wrong (downright stupid) to attribute the failure to the plug, and to predict the probability of future failure by replacing the plug failure probability by 1.0 in the existing PRA, while leaving everything else alone. It is no more correct than replacing the failure probability of all the parts that *don't* fail by zero. Yet the NRC has been doing exactly the first (though inexplicably not the second) for twenty-five years.

Of course they will say that it is conservative, but that is untrue. I usually use an aviation example (350 people killed in Japan) to make that point, but I don't want to puff up this note. The NRC staff has been cluttering up the literature with indefensible probabilities for decades, and the incident of the Rasmussen obit reminded me of it. I recommend (though I have no stature to do so) that ACRS take this on as a job. It is both morally wrong, and is potentially damaging,

At 10:10

to disseminate false information. We can't depend on NASA to do probability right, but we can set a good example.

Did I distribute to you guys the Op-Ed I wrote about the Columbia accident?

Cheers,
Hal

From: George Apostolakis <apostola@MIT.EDU>
To: <wjshack@anl.gov>, <dapower@sandia.gov>, <TSKress@aol.com>, <graham.b.wallis@dartmouth.edu>, <jdsieber@aol.com>, <mvbonaca@snet.net>, <gmleitch@aol.com>, <FPCTFord@aol.com>, <historyart@computron.net>, <ransom@ecn.purdue.edu>, <gxa@nrc.gov>
Date: 9/3/03 4:19PM
Subject: EDO's RESPONSE TO THE SAFETY CULTURE LETTER

Colleagues:

The EDO's letter (dated August 21, 2003) merely repeats our recommendations in the first paragraph and then proceeds to ignore them completely (I almost said "to completely ignore them," but then I corrected myself!).

The rest of the letter describes what the staff has been doing for some time. It mentions the Safety Culture and Climate Task Group's work on the findings of the 2002 OIG survey of NRC's safety culture. I read the Task Group's report. It deals with the generalities that one would expect from surveys done by social scientists. This doesn't mean that their work is not useful. It just doesn't address our concerns and those of the Lessons-Learned Task Force. The two concerns that we cite in our letter are:
! the NRC failed to adequately review, assess, and followup on relevant operating experience, and
! the NRC failed to integrate known or available information into its assessments of Davis-Besse's safety performance.

These issues have to do with organizational learning and technical knowledge. The OIG survey and, consequently, the Task Group do not deal with these issues.

In the same letter, the EDO says that the "staff will keep the ACRS informed as agency safety culture activities evolve." I think that the staff should brief the ACRS on its activities in the near future and, then, we should decide whether a second letter would be in order. It appears that the agency is relying exclusively on the OIG surveys. I don't think that's wise.

I ask that the P&P Subcommittee consider this issue at its September meeting.

George

Dr. G.E. Apostolakis
Professor of Nuclear Engineering
Professor of Engineering Systems
Room 24-221
Massachusetts Institute of Technology
Cambridge, MA 02139-4307, USA

e-mail: apostola@mit.edu
tel: +1-617-252-1570
fax: +1-617-258-8863

CC: <jtl@nrc.gov>, <MWW@nrc.gov>

John P. ...
29

From: George Apostolakis <apostola@MIT.EDU>
To: <mvbonaca@snet.net>, <historyart@computron.net>, <graham.b.wallis@dartmouth.edu>
Date: 9/4/03 2:00PM
Subject: DIGITAL I&C

Colleagues:

It has been a very long time since the ACRS has been briefed on the staff's activities on this subject. We were told years ago that the University of Virginia was developing methods for the inclusion of digital I&C failures into PRAs. I don't recall ever seeing any products from the UoV.

I remember that we selected three consultants and we had plans to hold subcommittee meetings once these consultants were hired. Then, nothing...

I suggest that the P&P Subcommittee discuss the issue and propose a course of action.

George

Dr. G.E. Apostolakis
Professor of Nuclear Engineering
Professor of Engineering Systems
Room 24-221
Massachusetts Institute of Technology
Cambridge, MA 02139-4307, USA

e-mail: apostola@mit.edu
tel: +1-617-252-1570
fax: +1-617-258-8863

*CAR: Another Member
Issue to add to
P&P agenda.
VTC*

5979

CC: <jtl@nrc.gov>

George Apostolakis recommends that the ACRS be briefed on NRC activities related to Digital Instrumentation and Control.

Steve 12/1/03

30