

Millstone Lessons Learned

Task Group

Report



Part 1: Review and Findings

U. S. Nuclear Regulatory Commission
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Report of the
Millstone Lessons Learned
Task Group
Part 1: Review and Findings

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EXECUTIVE SUMMARY

In October 1993, Northeast Utilities (NU) submitted a licensee event report (LER 93-11) for Millstone Unit 1 indicating that the unit had operated outside of the plant's design basis during refueling outages. The issues in the LER were (1) how much of the reactor core the licensee moved from the reactor vessel to the spent fuel pool during refueling operations and (2) the assumptions used in its updated final safety analysis report (UFSAR) and analyses that supported a previous license amendment. Between April 1994 and September 1995, the NRC followed up on the LER through its inspection program. By July 1995, NU had submitted a request for a license amendment that would allow the utility to offload the full core as its normal practice. A month later the NRC received a petition under 10 CFR 2.206 that requested the agency deny the change in the license. The petition, the LER, and other information prompted a number of reviews by the licensee and NRC, including investigations by the agency's Office of the Inspector General (OIG) and Office of Investigations.

Although the safety significance of Millstone's refueling practices was low, the agency initiated reviews of the underlying issues raised by those practices because of the regulatory significance of the issues. The subjects of these reviews were 10 CFR 50.59 and processes for implementing the rule, determining the licensing basis for spent fuel pools at all operating power reactors and comparing actual practices to the licensing bases, and reemphasizing incorporating final safety analysis reports (FSARs) into routine inspections. Concurrently, the staff began developing new guidance for enforcing compliance with regulations associated with FSARs. The staff also initiated an effort to examine the results of the other reviews, inspections, and investigations to determine the implications of their findings on the NRC's programs and processes. What the staff learned from this effort (the lessons learned review) is the subject of this report.

A task group was formed within the Office of Nuclear Reactor Regulation (NRR) with participation from the Office for the Analysis and Evaluation of Operational Data (AEOD) and NRC Region III to assess the lessons learned and to identify problems or deficiencies in NRR's programs as they related to the issues raised by the situation that developed at Millstone, and to make recommendations for NRC's programs and processes to permit earlier identification of similar issues should they arise at other plants. The task group's effort was divided into four general areas: inspection, licensing, enforcement, and licensee reporting. Other reviews dealing with issues that had been raised concerning allegations and the NRC's handling of them were not part of this lessons learned effort. The task group was free to explore areas, such as reevaluating the definition of current licensing basis, that had been previously reviewed and considered by the agency staff and Commission.

The task group is issuing its report in two parts. The first part describes the review and discusses the group's findings and recommendations in the four general areas of the review. The second part of the report will identify policy-related issues and present potential options for Commission consideration. The policy issues were separated from the detailed review to allow sufficient time to incorporate recent position papers on related topics from the NRC's Office of the General Counsel (OGC), and to have the report

reviewed by, and gain comments from, agency senior managers, regional managers, and inspectors. Part 1 of the task group's report follows.

In general, the nuclear power industry's safety performance has improved over the last ten years, and one indicator of this improvement is the continuing decline in reportable events. The industry's improvement is attributable to many factors from within the industry and from within the regulatory environment, and a major factor of the regulatory environment is the agency's focus on safety. That focus is most clearly evident in the agency's inspection program for operating nuclear power reactors. The various staff reviews and inspections found few examples with safety significance. The staff's verification of refueling practices found that the design bases for spent fuel pools at all plants had been reviewed and approved by the NRC, although a few plants may have refueled their reactors inconsistently with their FSARs. The staff concluded from its analysis of FSAR inspection data that the large majority of the findings were of low significance and those few issues that were potentially risk important had been identified and were within the group of issues being enforced through the agency's normal processes. Conversely, the special inspection of engineering and licensing at NU plants did find significant problems and confirmed problem areas previously identified by the NRC and licensee. The experience with the Millstone and Haddam Neck plants highlights the importance of regulatory issues and their correlation to safety.

The recommendations from each of the four general areas and additional management issues are:

Inspection

- Improve the integration of licensing and inspection.

The recommendations in the EDO's memorandum to the Commission on the staff's analysis of FSAR inspection data—to be issued presently—should be implemented to properly increase the focus of inspections on the FSAR.

The agency should establish a process for identifying and verifying those aspects of plant-specific licensing actions and activities whose implementation require agency verification.

- Establish the appropriate balance between compliance and safety

Inspectors need more guidance in the area of performance-based inspection and in the proper relationship between strict compliance with regulations and safety. The agency needs to maintain its emphasis on developing performance-based approaches for new regulations and continuing its performance-based changes to existing regulations.

- Clarify requirements for following up on corrective actions.

The inspection program needs to clearly state management's expectations for identifying, following up, and closing open items. The Inspection Program Branch should assess how the regions use the Inspection Followup System and the effectiveness of quality assurance-related inspections in identifying serious problems in licensees' quality assurance programs.

- Special-emphasis team inspections are effective in identifying design-related issues.

More focused, design-based inspection teams should be sent to plants of concern. In addition, the NRC's inspection program for engineering should be evaluated for its effectiveness in identifying deep-seated, design-based engineering issues.

Licensing

- Enhance identifying and verifying licensing-basis information.

Develop processes for identifying important aspects of plant-specific licensing actions and activities and assigning priorities for verifying implementation of those aspects.

Reissue and reemphasize existing guidance on commitments and their enforceability, and identify in which documents commitments must be recorded if the NRC does not want the licensee to change the commitments without first informing the agency.

Any processes the staff develops will be affected by decisions on policy issues concerning current licensing basis and design basis and in which documents such information should be located.

- Maintain the licensing basis current.

The interpretation and implementation of Section 50.71(e) should be reevaluated. Policy issues related to licensing basis, design basis, implementation of Section 50.59, and the information that should be in FSARs and that can be removed from FSARs could affect the update rule or its application.

Enforcement

- Present a clearer standing on use of licensing-basis documents.

The latest agency positions need to be reviewed and understood and used to revise enforcement guidance and practices that are consistent with the positions. Should the reference to FSARs in operating licenses prove to have significance, several licenses that do not now directly refer to the FSAR may need to be amended.

Licensee Reporting

- Clarify the relationships between reporting requirements.

Determine the relevance of Section 50.59 and evaluations for unreviewed safety questions to existing or as-found conditions in plants. After determining relevance, new guidance needs to be developed or existing guidance modified to clearly establish actions the agency expects licensees to take in resolving degraded or nonconforming conditions, including the role of Section 50.59.

- Improve understanding of the importance of design basis.

Consider if additional actions are needed to ensure that the design bases are understood and appropriately used. Place a priority on adding guidance to and issuing the latest draft of NUREG-1022.

Management

- Agency management needs the tools to determine its expectations are being met.

Enhance systems that measure compliance with management objectives. The responsibilities for staff positions need to be clearly established and the guidance for meeting the responsibilities should be clear, consistently documented and perpetuated, and periodically reviewed for relevance.

- Enhance the training and qualifications programs for those with inspection and review responsibilities.

The agency needs to determine if its employees with inspection and review responsibilities have all the necessary knowledge and skills to independently verify the acceptability of design-related actions, and whether that knowledge and skills base needs to be developed further. The task group concludes that the training requirements for such personnel should be evaluated to ensure it includes the appropriate mix of formal training and on-the-job training commensurate with employees' past experience, and that mechanisms are in place to ensure perpetuation of training requirements.

- Agency management needs to use the tools available to it in determining performance of licensees

Recent changes to the senior management meeting and plant performance review processes have added structure and more objective criteria to those processes. Implementation of these changes and their effectiveness in identifying plants of concern and focusing agency attention on them should continue.

A recommended review of the use of the Inspection Followup System by the Inspection Program Branch should include its use as a management tool.

- Improve agency information databases.

The agency needs to continue its efforts to produce better information databases to allow the staff to locate pertinent documents and information. The Automated Inspection Reporting System currently being developed, will create a database for all inspection findings; and the agency is pursuing a system to upgrade the agency's overall document management database. These efforts need to meet the agency's basic need for easily retrieving accurate information in light of an environment of reduced funding, fewer managers for oversight, and fewer positions to administer the systems and assure data accuracy.

License Renewal

- The license renewal rule relies on the current regulatory process to ensure an acceptable level of safety, with the possible exception of managing the effects of aging during the period of extended operation. The issues raised at Millstone, Haddam Neck, and Maine Yankee question the adequacy and implementation of the current regulatory process and thus, could potentially impact the underpinning of the license renewal rule. The potential impact on license renewal should be evaluated.

A number of the lessons learned and recommendations relate to issues that will require new policy decisions or reevaluation of past decisions by the agency. Part 2 of the lessons learned report, which will be issued separately, will discuss these issues and present options for the Commission's consideration. The issues relate to the following questions:

- What should be the licensing basis for an operating plant and in which documents should it be located so it is accessible to the licensee, the NRC, and the public?
- What information should be in the FSAR?
- Has the NRC done enough to ensure the design basis is sufficiently understood and is being used properly?
- What information, if any, may licensees remove from their FSARs without a corresponding change to the facility?
- What should be the scope and threshold of Section 50.59?
- Should the agency more formally establish its position on the actions a licensee should take after identifying degraded or nonconforming conditions?

The NRC takes its mission to protect public health and safety seriously and has more strongly emphasized safety over merely complying with its regulations. The NRC expects licensees to do what is safe and to fully comply with its regulations; not what just minimally satisfies the rules. The accumulation of operating experience and the refinement of probabilistic risk analyses have pointed to requirements that have marginal safety benefit. The agency has been taking actions during the past decade to reduce such regulations and unnecessary regulatory burden on reactor licensees. Among these efforts are improvements in NRC regulations from recommendations from the internal 1993 Regulatory Review Group and the government-wide National Performance Reviews, the promulgation of performance-based rules such as the maintenance rule, expedited processing of license amendments that seek to modify or delete requirements that have a small effect on safety and are costly to implement, and encouraging licensees to convert to improved standard technical specifications that remove nonspecification information from the license and place it into other licensee-controlled documents. The thrust of these efforts will be to further eliminate requirements that are not directly linked to safety and to bring into closer convergence safety and regulatory compliance.

Compliance with some specific regulations, such as reporting changes to licensing basis documents, may not have a clear and direct affect on safe plant operations or public health and safety, but do have regulatory significance. A licensee's programs that do not ensure the underlying reason for such regulations are maintained may be an indication of more serious, safety-related deficiencies. Until such time that those regulations without a clear safety benefit are changed or eliminated, licensees are required to comply with all applicable regulations unless the licensee has proved to the NRC that relief from the regulation is warranted. And as an agency, the NRC is required to enforce those regulations.

1 INTRODUCTION

In October 1993, Northeast Utilities (NU) submitted a licensee event report (LER 93-11¹) for Millstone Unit 1 indicating that the unit had operated outside of the plant's design basis during refueling outages. At issue in the LER were (1) how much of the reactor core the licensee moved from the reactor vessel to the spent fuel pool during refueling operations and (2) the assumptions used in its (a) updated final safety analysis report (UFSAR) and (b) analyses that supported a previous license amendment. The NRC followed up on the LER in several inspection reports between April 1994 and September 1995. By July 1995, NU had submitted a request for a license amendment that would allow the utility to off-load the full core as its normal practice. The NRC received a petition under 10 CFR 2.206 in August 1995 that requested the agency deny the change in the license. The petition, the LER, and other information prompted a number of reviews by the NRC, including investigations by the agency's Office of the Inspector General (OIG) and the agency's Office of Investigations.

NU's assessment of the root causes of problems at Millstone Unit 1 (Adverse Condition Report (ACR) 7007) stimulated additional actions by both NU and the NRC. By February 1996, both the licensee and the NRC had undertaken a number of reviews and inspections at two of the utility's sites: Millstone and Haddam Neck. In addition to its focus on the individual plants, the agency initiated reviews of the underlying issues raised by the refueling practices at Millstone. Among the subjects of these reviews were (1) 10 CFR 50.59 and processes for implementing the rule, (2) determining the licensing basis for spent fuel pools at all operating power reactors and comparing actual practices to the licensing bases, and (3) reemphasizing incorporating final safety analysis reports (FSARs) into routine inspections. Concurrently, the staff began developing new guidance for enforcing compliance with regulations associated with FSARs. The staff also initiated a "lessons learned" review to examine the results of the other reviews, inspections, and investigations to determine the implications of their findings on the NRC's programs and processes. That review is the subject of this report.

In May 1996, the OIG issued a report on Maine Yankee that touched on some of the same programs and processes affected by the issues raised at Millstone and that were the subject of the lessons-learned review.

2 SCOPE AND METHOD

A task group was formed of staff members from the Office of Nuclear Reactor Regulation (NRR), the Office for Analysis and Evaluation of Operational Data (AEOD), and the Region III office. The group developed a plan to identify problems or deficiencies in NRR's programs as they related to the issues raised by the situation that developed at Millstone, and to make recommendations for NRC's programs and processes to permit earlier identification of similar issues should they arise at other plants. The task group's plan, approved on April 18, 1996, by the Director, NRR, is included as Appendix A.

¹The original LER was supplemented once on December 27, 1995. The supplement contained more detail than was in the original LER (September 1993).

2.1 Scope

In her letter of November 30, 1995, requesting a lessons-learned review, NRC Chairman Jackson asked the staff to identify those regulatory oversight processes that need improving and new processes that need to be developed, that would have led to the NRC's earlier identification of and action on Millstone's deviations from its FSAR (Ref. 1). When the group was formed within NRR, it was directed to broadly consider the NRC's regulatory program for power reactors and to determine the implications of the lessons learned from the other specific reviews for the program and the policies that provide direction for the program. The task group's effort was divided into four general areas: inspection, licensing, enforcement, and licensee reporting. The task group did not thoroughly assess the agency's implementation of programs within these areas; it evaluated the program implications of the findings from other efforts and supplemented some findings with independent research.

Other reviews dealing with issues that had been raised concerning allegations and the NRC's handling of them were not part of this lessons-learned effort. The task group was free to explore areas, such as reevaluating the definition of current licensing basis, that had been previously reviewed and considered by the agency staff and the Commission.

2.2 Method

The task group collected documents and other information related to the issues in the four general areas, discussed the findings from other activities with the principal staff for those activities, and conducted its own research into the history of regulations and programs. The task group issued surveys to NRR project managers (PMs) and to agency inspectors to gauge their understanding of program requirements and responsibilities, and to determine if certain tasks were accomplished and how they were accomplished and documented. The surveys are included as Appendix B.

Several factors ultimately led to a decision to issue the task group's report in two parts. First, the timing of several key staff activities upon which the group was relying for information was similar to the task group's time line and the activities' reports would not be complete before the task group's report was due. Second, the task group had difficulty obtaining meaningful information from several agency databases. Third, the NRC's Office of the General Counsel issued, toward the end of the task group's efforts, an internal position paper on topics related to several of the policy issues the task group's report was to address, and time was needed to consider the positions so they could be incorporated into the policy discussions. Lastly, the Commission had asked the task group to include consideration by regional and resident inspectors in its findings and recommendations.

The task group reported through the Director, Division of Inspection and Support Programs, to the Director, NRR, for direction and guidance. The group's findings were shared with the regional administrators, other senior agency managers, and field personnel to benefit from their views and comments.

3 GENERAL DISCUSSION

The NRC grants licenses to responsible entities to operate particular nuclear power reactors. The entities are required to operate their facilities in accordance with the license

and with all NRC regulations applicable to the facility; they are expected to comply with all commitments the organization has made to comply with NRC regulations. Among the agency's regulations to which licensees must comply are requirements for processes for changing the license or certain other information used during the licensing process. The licensees, therefore, are responsible for the safe operation of their facilities.

The NRC grants licenses and oversees operation of facilities through audit programs that provide reasonable assurance that licensees are operating safely and complying with regulations. The agency's operational oversight is primarily through its inspection program, which is based on selectively sampling equipment, operations, and licensee's processes and activities. The agency's verification extends to operational events and problems reported to the agency by the licensees in accordance with regulations. The program includes requirements for following up on concerns and enforcing requirements, through the enforcement program, with actions that are commensurate with the significance of the issue being enforced.

The agency gathers information on a regular basis from its inspection, licensing, and enforcement programs, and from licensee reports—along with other objective data—and assesses the overall performance of each plant. These assessments are performed at different levels within the agency and are used to refocus the agency's inspection efforts, to involve higher levels of agency management in decisions regarding plants with performance problems, and to coordinate agency actions for plants that are of the most concern to the agency (Ref. 2). Therefore, the agency's licensing, inspection, enforcement, and assessment processes are closely interrelated, although the reviews have highlighted a weakness with the integration of certain licensing information.

The NRC's programs emphasize operational safety and plant performance and verify that plant operation and design are maintained within licensed conditions. The audit nature of the programs and their safety emphasis contribute to less oversight of less significant issues and issues more closely related to compliance than to safety. The compliance issues can have regulatory significance that may ultimately indicate more significant problems with licensees. For the NRC to identify compliance and regulatory-based issues similar to those at Millstone at an earlier stage, the agency needs to do a better job of looking for them through inspections and licensing reviews or be aware of them through licensee reports. The NRC's licensing process has to better identify the important aspects of plant-specific licensing actions and activities and assure those aspects are captured in the appropriate licensing document, and the inspection and licensing processes need to work together closer in choosing those aspects that need verification and then verify them. The inspection program also needs a strong design-based inspection element as part of its engineering oversight to help detect design-based engineering problems.

The regulatory processes brought into question by the activities surrounding Millstone, Haddam Neck, and Maine Yankee cover a wide range of elements. The next sections give some background for those regulatory elements.

3.1 Applicable Regulatory Documents and Regulations

The following sections explain the principal regulations, requirements, and documents associated with the issues raised through the core-offloading practices at Millstone Unit 1 and the various associated reviews conducted by the staff.

3.1.1 Operating Licenses

The NRC issues a license for operating a nuclear reactor power plant after finding that the plant has been built according to its design and can be operated within its design limits. The license describes the facility in the most general terms, includes specific conditions imposed on the facility and licensee, and incorporates the technical specifications approved by the NRC. Other conditions, such as requirements for plans or programs dealing with quality assurance, emergency planning, and safeguards contingencies, are incorporated into the license through 10 CFR 50.54, "Conditions of licenses." The rules and process for changing a license or conditions of a license are governed by Sections 50.90, "Application for amendment of license or construction permit," 50.91, "Notice for public comment," and 50.92, "Issuance of amendment."

Section 50.54(f), which is made a condition of all operating licenses, requires licensees to submit written information under oath or affirmation when requested by the Commission to determine if a license should be modified, suspended, or revoked. It is only in this section that the term "current licensing basis" is used in Part 50. The rule requires the Commission to justify all requests for information, except for "information sought to verify licensee compliance with the current licensing basis for that facility."

3.1.2 Technical Specifications

Section 182 of the Atomic Energy Act of 1954, as amended, grants the NRC the authority to include technical specifications in licenses. That authority is implemented through 10 CFR 50.36, "Technical specifications," and Section 50.50, "Issuance of licenses and construction permits." Section 50.36 defines for inclusion into technical specifications safety limits, limiting settings for safety systems, limiting conditions for operation, surveillance requirements, design features to which changes would have a significant effect on safety, and administrative controls necessary to ensure safe operation. The technical specifications are derived from the safety analysis, evaluations, and design basis described in FSARs, although the Commission may include any additional technical specifications it finds appropriate.

NRC must approve changes to technical specifications before the licensee may implement them. Because the technical specifications are part of the facility's license, the changes require a license amendment and are subject to the regulations governing the application for and issuance of license amendments.

3.1.3 Final Safety Analysis Reports

The contents of an application for an operating license are delineated in 10 CFR 50.34, "Contents of application; technical information," which includes requirements for the FSAR. By regulation, FSARs contain a description of the plant; they present the design basis for the facility and limits on the facility's operation; and they present the safety analysis for the facility's structures, systems, and components. The safety analysis emphasizes the performance requirements of the structures, systems, and components, the bases and technical justifications for the performance requirements, and evaluations to show the safety functions will be accomplished. The design bases presented in FSARs is defined in Section 50.2, "Definitions." It includes the specific functions that structures,

systems, and components need to perform, the parameters that need to be controlled to assure that function, and the values or range of values that bound the design.

Changes to FSARs are regulated by two sections: 50.59, "Changes, tests, and experiments," and 50.71, "Maintenance of records, making of reports." Section 50.59 allows licensees to make changes to their facilities and procedures as described in the safety analysis report and conduct tests not described in the safety analysis report without prior NRC approval when the changes or tests do not affect the technical specifications or do not involve an unreviewed safety question. Section 50.71(e) is a broad rule for updating FSARs to include the affects of all changes made to the facility or procedures described in the FSAR, all safety evaluations performed by the licensee in support of license amendments or conclusions that a change did not involve an unreviewed safety question, and all analyses performed at the Commission's request to address new safety issues.

"Licensing bases" is not defined in Part 50, although the agency has interpreted it to include the FSAR because the FSAR is the primary document upon which the Commission bases its decision to issue an operating license. "Current licensing basis" is defined in Part 54, the rule for renewing an operating license. The definition of current licensing basis in Section 54.3 includes all the requirements applicable to the facility, and a licensee's written commitments to ensure operation within the requirements and the plant's design basis. A plant's original design basis (as defined in the regulations), which is required to be in the FSAR, is part of the plant's original licensing basis and its current licensing basis. However, the agency has not interpreted Section 50.71(e) to require new design bases as a result of new requirements or generic communications to be included in the updated FSAR. In addition, the staff's evaluation of licensee's design control practices in 1991, which resulted in an agency policy statement on design bases a year later, found that "plants had insufficient design documentation to support the as-built facility" and that merely identifying functions and controlling values and parameters without the supporting engineering or design analysis was not sufficient to have an adequate design basis. Therefore, a plant's complete design basis may not be in the updated FSAR or in the licensing basis.

3.1.4 Reporting Requirements

In addition to its requirements for determining which changes to nuclear power plants need NRC approval, Section 50.59 includes requirements for licensees to maintain records of changes to their facilities and to periodically report to the NRC a summary of the changes and the safety evaluations. Other applicable reporting regulations are Sections 50.72, "Immediate notification requirements," and 50.73, "Licensee event report system." Both of these regulations require licensees to report to the NRC conditions that are outside of the plant's design basis or that place the plant in an unanalyzed condition, when the licensee becomes aware of such conditions.

Section 50.9, "Completeness and accuracy of information," requires that the information that licensees submit to the Commission or that is required to be maintained by the licensee be complete and accurate in all material respects. It also requires licensees to inform the Commission of any information licensees identify that has "significant implication for public health and safety or common defense and security."

3.2 Processes for Resolving Generic Issues

NRC has formal processes in place for systematically reviewing operational data and other technical information to ensure that concerns that potentially affect safety are identified, analyzed, resolved, and documented. The processes also provide for, when appropriate, developing and issuing such generic communications as information notices, bulletins, and generic letters. The process for preparing generic communications for power reactors is found in NRC's Inspection Manual Chapter (IMC) 0720 (Ref. 3).

Information notices bring to the attention of licensees information about recently identified significant issues affecting safety, safeguards, or the environment. The licensees are expected to review the information for applicability to their facilities, and consider actions, as appropriate, to avoid similar problems. The NRC does not require any specific action or response to an information notice. If the staff determines, as a result of its review of an issue, that licensees should take specific actions or provide analyses or other information for NRC's review, the staff issues a generic letter or bulletin. Typically, a bulletin requests specific actions, but does not request continuing actions. Generic letters ask licensees to either perform a new analyses, send to the NRC descriptions of corrective actions or technical information, or make new commitments for continuing actions.

The process for issuing a bulletin or generic letter typically involves having the proposed communication reviewed by standing committees², placing a notice about the proposed communication in the *Federal Register* to obtain comments from interested parties, and informing the Commission of the intent to issue the communication. If the staff requires responses from licensees in accordance with 10 CFR 50.54(f), it performs a 10 CFR 50.109 backfit analysis unless the information is requested to confirm compliance with the current licensing basis. For urgent matters, a bulletin or generic letter may be issued without the notification and review steps. Bulletins and generic letters will require that the licensee respond and indicate if it will undertake the actions requested by the NRC³. The communication might ask licensees to submit descriptions or analyses, notify the NRC when actions are complete, request changes to technical specifications, or other actions.

The generic communications process also provides for verifying licensees' implementation of actions in response to generic issues. IMC 0720 requires the staff to decide whether a temporary inspection instruction is to be developed pertaining to the bulletin or generic letter when the staff develops and issues generic communications. If the licensee's actions are to be verified at only a sample of the affected facilities, the temporary instruction must state the basis for determining the sample size. The regions are typically required to send NRR a summary of the inspection results and a recommendation about whether or not additional inspection activities or other actions are warranted.

For certain TMI (Three Mile Island) action items, the NRC issued temporary instructions (TIs) specifying which of the actions were to be verified following implementation by the

²The Committee to Review Generic Requirements is an inter-office NRC committee chartered to review proposed generic requirements to be sure that they are adequately justified in accordance with Sections 50.54(f) and 50.109.

³If an addressee declines to perform ³If an action requested in a bulletin or generic letter, the staff decides whether a requirement for action should be imposed by NRC order.

licensee. The NRC's regional offices scheduled and performed these inspections to verify proper implementation of the requirements. Verification of a TMI item at a plant was not considered complete until the required inspection was conducted in accordance with the TI and the regional office was convinced that the licensee had adequately satisfied the requirements. The guidance stated that, when the licensee completed a TMI action item, associated procedures and equipment should be in conformance with NRC requirements and licensee commitments. NRC staff members were to ensure, for verifying implementation, that licensees met commitments made to the NRC for those issues requiring verification.

As part of the NRC's efforts to ensure the quality and accountability of safety issue information, the agency established a program for publishing an annual report on the status of licensee implementation and verification of safety issues in major areas of NRC requirement. The implementation and verification status of TMI Action Plan requirements, unresolved safety issues (USIs), and generic safety issues (GSIs) were initially reported in Volumes 1, 2 and 3 of NUREG-1435, "Status of Safety Issues at Licensed Power Plants," published in 1991. The data in the latest report is a product of the NRC's Safety Issues Management System (SIMS), which is maintained by NRR. SIMS was designed to track issues from their identification through implementation of associated actions and field verification. The NRC has paid significant attention to the quality review of TMI Action Plans, USIs, GSIs, and other multiplant action implementation and verification data in SIMS.

The staff concluded in NUREG-1435 that, after a detailed review of the implementation and verification status of TMI Action Plan items, USIs, GSIs, and other multiplant actions... (1) the NRC closure process for TMI Action Plan issues, USIs, GSIs, and other multiplant actions is adequate for protecting public health and safety and (2) the framework exists for verifying that open items are dispositioned in the future.

3.3 Management Expectations and Staff Guidance

By means of a number of processes and vehicles, the NRC communicates to the staff management's expectations and transmits to the staff management guidance for fulfilling staff responsibilities. At the agency level, the NRC uses the Management Directive System to communicate policies, objectives, responsibilities, authorities, requirements, guidance, and other information to NRC employees as these relate to pertinent laws, Executive Orders, regulations, and directives of other Federal agencies affecting NRC policies, responsibilities, and procedures (Ref. 4). The various parts of the Management Directive System cover agency operations ranging from computer operations to travel. Volume 8, "Licensee Oversight Programs," contains directives related to the processes discussed in this review, such as evaluating events, diagnostic evaluations, and overall processes for evaluating licensee performance.

Another agency-level document applicable to the present review is the NRC Inspection Manual. The manual chapters contain policy and expectations for the various inspection programs and related activities, such as preparing and following up on generic communications. The inspection program's procedures contain requirements and related guidance for inspectors in conducting specific inspections. The Inspection Manual also has a special section for more general guidance on technical issues and on regulations and

implementation of the regulations as they apply within the scope of the inspection programs.

The inspection program also addresses following up on licensee responses to notices of violation and licensee event reports. Specifically, the inspection program contains guidance and requirements for reviewing licensee responses to notices of violation and notices of deviation to establish that adequate corrective actions were taken for violations and deviations, that their root causes were identified, that their generic implications were addressed, and that the licensee's quality assurance program procedures and practices were appropriately strengthened to prevent the recurrence of significant problems.

At the office level within NRR, expectations, guidance, and procedures are found primarily in NRR's Office Letters. Office Letters cover a wide range of office activities, such as delegating signature authority, processing changes to technical specifications and other license amendments, releasing draft or predecisional documents and information, reviewing draft documents submitted by licensees, and domestic and foreign travel by NRR employees. Specific to the project management function, NRR issued a Project Manager's Handbook in 1985, and revised it in 1989 (Ref. 5). The handbook contains expectations and guidance for PMs on many topics, including Section 50.59 reviews, FSARs, and updates to FSARs.

Guidance and management expectations are also communicated to employees through memoranda sent to all staff or to staff performing functions to which the guidance pertains. In addition, the regions develop and issue local instructions to their employees to implement agency programs, policies, and initiatives.

4 LESSONS LEARNED AND RECOMMENDATIONS

The next sections present the lessons learned and task group recommendations in each of the four areas of review and in management of those areas.

The task group identified several areas that raise issues with policy that will require Commission consideration before the staff can take definitive action. These policy issues are briefly discussed below—and will be discussed in more detail in Part 2 of this report, along with options for the agency to consider. Senior agency managers, regional managers, and inspectors will be given an opportunity to review and comment on the issues and options before the report is presented to the Commission later this year.

4.1 Inspection Process

The task group found, on the basis of its review of the other NRC activities, several areas associated with the inspection program that could be enhanced or improved. Those areas include better integration of licensing and inspection, a more appropriate mix of compliance-based inspection with performance-based inspection, followup of corrective actions, special emphasis inspections, and inspector qualifications.

The task group recognizes that any resulting changes to the inspection process or program should be implemented only after careful consideration to ensure that discrete changes do not adversely affect the higher goal of maintaining reactor safety. This consideration is

especially needed for any program changes that may decrease the value of individual inspector judgement or increase inspection resources.

4.1.1 Improved Integration of Licensing and Inspection

The 1987 reorganization of the NRC, which integrated the inspection function of the former Office of Inspection and Enforcement into NRR, was mostly effective. The integration's effectiveness can be seen in the processes for resolving generic issues, headquarters' support of the regions in addressing multiplant actions, and in improvements in NRC's impacts on licensees. However, a result of the 1987 reorganization was increased recognition of the need for selective verification of safety improvements from plant-specific licensing requirements. Although a process was established in 1989 in certain staff guidance documents, it was not effectively used for plant-specific licensing actions. Now, verification of such actions, when they occur, are usually handled by verbal requests from the PMs to the resident inspectors, or actions were verified by the project manager.

The agency issued interim guidance to its inspectors in February 1996 to emphasize incorporating associated sections of FSARs into the preparation for inspections, and then to document findings related to the FSAR in a specific section of inspection reports. The staff evaluated the findings from a 3-month period, assessed the significance of the inspection findings and NRC followup actions, and made recommendations for short-term and longer term improvements to the NRC's inspection program. The staff's analysis and recommendations are in the Executive Director for Operations' memorandum to the Commission, "Final Safety Analysis Report Inspection Results and Planned Improvements," which will be issued presently.

Recommendations

The task group recommends that the planned improvements discussed in the memorandum on FSAR inspection results from the EDO to the Commission be implemented. New inspection guidance developed as a result of the improvements should consider the variations in the level of detail found in updated FSARs. The guidance also must be consistent with the legal and regulatory standing and enforceability of the updated FSARs.

The agency needs to establish a process for identifying and verifying those aspects of plant-specific licensing actions and activities whose implementation requires agency verification.

4.1.2 Performance-Based vs. Compliance-Based Inspection

When the inspection program originated in the early 1970's, the standards were centered on compliance with regulations. Over time and because of many influences, the standards evolved throughout the late 1970's and 1980's to emphasize safety first over literal compliance, which has become a secondary standard. The current program emphasizes safety and "performance-based" inspection. The program's emphasis, and potential misunderstanding of performance-based inspection and regulation by NRC staff, may have contributed to situations like the Millstone Unit 1 spent fuel pool issue in that issues involving noncompliance with regulations and licensee commitments that have little if any safety consequences are not emphasized. As a result, noncompliance issues might not be

pursued in the enforcement process unless direct, credible, adverse safety consequences could result.

The proper role of strict compliance with regulations within the agency's programs is being reevaluated as a result of the Millstone issues. The inspection program's emphasis on safety, its reliance on finding performance problems before investigating the underlying programmatic issues, and its audit nature of only overseeing a portion of the licensees' activities may have deemphasized the regulatory significance of compliance. For compliance and safety to more closely converge, regulations must be interpreted or must be rewritten to permit performance-based, results-oriented implementation and verification.

Recommendations:

The task group concludes that inspectors need more guidance in the area of performance-based inspection and in the proper nexus between strict compliance with regulations and safety. Emphasis should remain on developing performance-based approaches for new regulations and continue on performance-based changes to existing regulations.

4.1.3 Inspection Followup of Corrective Actions

The NRC's inspection program contains detailed requirements for verifying actions that licensees perform in response to notices of violations and deviations, other inspection findings, and LERs. The inspection program is an audit program and provides for selecting issues for detailed followup on the basis of the significance of the issue or event. Although the requirements in certain followup inspection procedures state that corrective actions are to be fully implemented, the general guidance for the inspection program allows inspectors to consider inspection requirements in conducting the inspection and allows inspectors not to perform all of the inspection as long as the objectives of the procedure are met.

The agency sent a special inspection team (SIT) to Millstone and Haddam Neck to inspect engineering and licensing activities at those facilities in response to the issues surrounding the spent fuel pool and refueling activities at Millstone Unit 1. In several instances at Millstone and Haddam Neck, the SIT found that the NRC closed out followup actions that the licensee never implemented. To further pursue inspectors' practice and understanding of requirements for the completeness of licensee corrective actions, the task group surveyed regional and resident inspectors. Approximately 140 inspectors, about 40 percent of the resident and regional inspectors, responded.

The task group's survey of inspectors found wide variation in practice and understanding of the required state of completion for corrective actions being followed up. The survey form asked if the inspectors felt "inordinate pressure" to close open items, and if they did feel pressure, were accommodations made to keep items open if necessary. The survey found a large percentage of inspectors perceived pressure to keep the number of open items small with almost half of those feeling reasonable accommodations are made for items to remain open when necessary. Several inspectors described in explanatory notes how open items can be closed and then reopened to give the semblance of meeting their management's expectations that no items remain open for more than two years. Other inspectors indicated that the pressure to close items was from a time limit imposed by the item tracking system, the Inspection Followup System (IFS).

The performance orientation of the inspection program leads inspectors into programmatic areas generally after performance problems are found. Quality assurance areas are reviewed through inspection procedures that assess how well the licensee is identifying and correcting problems. The SIT found at Millstone that the site's quality assurance program was not effective. This was not new information. The existence of corrective action program problems had been known by the NRC for a number of years. However, the depth of the problems may not have been previously understood.

By reviewing why open items have not been closed, NRC managers may gain insights into either problems with the licensee's corrective action processes or issues with NRC inspection resources. Incomplete or misleading information in the open items tracking system, in combination with the revealed inconsistent closeout standards for corrective action status and contradictory program requirements for completeness of corrective actions, may be responsible for the NRC having a poor understanding of the effectiveness of a licensee's corrective action program.

Recommendations

The inspection program needs to clearly state management's expectations for identifying, following up, and closing open items. The Inspection Program Branch should assess the regions' use of the open items tracking system and the effectiveness of quality assurance-related inspections in identifying serious problems in licensees' quality assurance programs.

4.1.4 Effectiveness of Special Emphasis Team Inspections

The NRC's "vertical slice," design-based engineering inspections were effective in identifying design-related issues. Several events in the mid-1980's, such as the loss of feedwater experienced at the Davis-Besse plant in 1985, helped to focus the NRC and the industry on the maintenance of well-defined design bases. The NRC developed a number of specialized, vertical slice design inspections that identified licensees that had not adequately maintained their design bases, or that had not maintained adequate supporting documents. The problems being identified led to the industry's voluntary development of programs to reconstitute design documents. Some of these programs were not as successful as others and some licensees, including Millstone, may not have made full use of the available design basis information. However, over time, the number of NRC team inspections was reduced, because they were resource-intensive and burdensome to the NRC and licensees, as licensees began their own in-depth self-assessments and as the NRC gained confidence in licensees' corrective action programs.

The task group's analysis of design-based licensee event reports found that NRC team inspections were a major initiator of such reports. The SIT at Millstone and Haddam Neck found a number of problems and weaknesses in NU's design-basis documents and in its corrective action and quality assurance programs. It also confirmed the design-basis issues previously found by the licensee and reported in Adverse Condition Report (ACR) 7007.

Recommendation

The task group recommends that more focused, design-based inspection teams be sent to plants of concern. In addition, the NRC's inspection program for engineering should be evaluated for its effectiveness in identifying deep-seated, design-based engineering issues.

4.2 Licensing Process

4.2.1 Identifying and Verifying the Licensing Basis

Licensees are responsible for complying with NRC regulations and for safe operation of their facilities, and the NRC relies on and expects licensees to meet their commitments to the agency. Licensee commitments are written down in a wide range of licensing documents, which have various degrees of control. The controls range from formal requests for NRC approval with associated public notification and opportunity for hearings, to licensees' abilities to make changes after a formal review process with periodic notification to the NRC, to licensees' internal tracking systems with informal criteria for notifying the NRC of changes.

Recognition of these processes is part of the basis for the definition of current licensing basis in 10 CFR Part 54 and for the Commission's recognition of the general effectiveness of the NRC's regulatory processes. The general effectiveness of the processes also was the basis for the Commission's decision not to have licensees compile their licensing basis when the agency promulgated the Part 54 license renewal rule. Information on the docket is considered retrievable and the NRC has no systems for identifying or determining the status of commitments other than commitments for generic issues that are tracked in the agency's Safety Issues Management System. Nor does it have an established process for verifying implementation of commitments made for plant-specific licensing actions or activities.

The staff's reviews and investigations of the issues raised at Millstone and Maine Yankee found that both licensees and the NRC staff have difficulty identifying and retrieving the licensing and design bases, and that some design basis information and verbal understandings relied upon by the staff and licensees may not be recorded (on the docket). The staff, in many cases, relies on the licensees providing all pertinent information, including what is already on the docket. For example, the staff identified for all power reactors the design basis for one aspect of spent fuel pools that could be found within certain licensing basis documents. To meet its schedule, the staff found in several cases that it was quicker to have the licensee provide the associated documents than to search the plant's docket.

The staff records its approvals of licensing actions and other licensing activities in safety evaluation reports (SERs). The OIG report for Maine Yankee pointed out that the licensee had not met a number of conditions the staff included in a particular SER, and the staff's review of spent fuel licensing bases found examples of SERs that did not do a good job of describing the basis for the staff's approvals. Conditions that the staff places on its approval or actions the staff expects licensees to take that are documented in SERs do not constitute licensee commitments. Guidance provided to the staff as early as 1981 indicated that commitments made by the licensee, either in writing or orally, are not legally binding on the licensee and should not normally be relied upon for staff approvals. The guidance went on to say commitments that the staff determines are necessary elements for supporting its approval should be documented by the licensee and clearly spelled out in the SER and ultimately reflected in the plant's FSAR. The guidance also indicated that, if the commitment was of such importance that it should not be changed without NRC approval, it had to be incorporated into the technical specifications or made a condition of the license.

Recommendations

The staff needs to develop processes for identifying important aspects of plant-specific licensing actions and activities and for assigning priorities for verifying implementation of those aspects.

The agency needs to reissue existing guidance on commitments and emphasize their enforceability. Also, if the NRC does not want the licensee to change the commitments without first informing the agency, the NRC needs to re-inform licensees where the commitments must be written down (in which documents).

Any processes the staff develops will be affected by decisions on policy issues concerning the current licensing basis and the design basis and in which documents such information should be written down.

4.2.2 Use and Maintenance of FSARs and the Licensing Basis

The FSAR (and, by extension, the updated FSAR) is the principal document that describes the basis upon which the operating license is granted. Section 50.59 allows licenses to make changes to their facilities and procedures as described in the safety analysis report, and Section 50.71(e) requires an update to the FSAR for those changes to the facility that affect the plant as described in the safety analysis report, safety evaluations in support of unreviewed safety question determinations, and analyses that address new safety issues. The updated FSAR (UFSAR) was to be an accurate and up-to-date reference for changes to the facility and license and was to record how the licensee satisfied new requirements (Ref. 6).

NU's event analysis at Millstone found that the plant's original FSAR was not accurate, that the plant's administrative processes would not have maintained the FSAR accurately, and that plant personnel did not fully understand the relationships among various documents within the licensing and design bases of the plant. The NRC's SIT verified NU's findings and found indications of similar problems at Haddam Neck. Other efforts by the staff, such as the spent fuel pool licensing bases review and FSAR inspection focus, identified other plants with inaccuracies in their FSARs; some FSARs contained hundreds of minor discrepancies. The agency recognized that UFSARs did not contain the current licensing basis when it promulgated the license renewal rule, 10 CFR Part 54. In 1992, the staff reported to the Commission that neither the NRC nor industry have interpreted the update rule (Section 50.71(e)) to require new commitments or design bases for new rules, generic letters, bulletins, enforcement actions, and LERs be included in the FSAR (Ref. 7). In SECY-92-314 the staff and Commission concluded that revising the interpretation of the update rule to include all of the current licensing basis was neither cost effective, nor a benefit to safety (Ref. 8). They also concluded not to require licensees to compile their current licensing bases.

Not all the guidance provided to industry and the NRC staff has been consistent with the regulations and with considerations for updating FSARs and maintaining them accurately. Guidance for NRR PMs, last revised in 1989, recognized that the agency had no process for auditing periodic updates of FSARs; therefore, PMs were expected to review the updates for new information that had not been previously submitted. The staff's review of spent fuel pool licensing bases found several licensees that had not updated their UFSARs

consistent with the intended purpose of Section 50.71(e), and the task group's survey of PMs found few PMs review the FSAR updates submitted by their assigned facilities.

Recommendations

The interpretation and implementation of Section 50.71(e) needs to be reevaluated. Notwithstanding related policy issues, the update rule as written would encompass most information the agency relies upon with minor changes to internal processes. However, decisions on policy issues related to licensing basis, design basis, and what information should be in FSARs and what can be removed from FSARs could affect the update rule or its application.

4.3 Enforcement Process

4.3.1 Clarification of the Legal and Regulatory Standing of the FSAR and UFSAR

Every operating license for a nuclear power plant contains within the body of the license a reference to the FSAR, the UFSAR, or a description of the application for a license (which includes the FSAR). These references may form the basis for industry's perception of a change in NRC's position on FSARs. In an unsolicited report sent to the Commission in July 1996, the Nuclear Energy Institute (NEI) indicated that "NRC staff have stated that, in their view, all commitments and statements in the FSAR should be treated as 'stand alone' requirements" and any deviation from the FSAR "would be a violation of NRC requirements" (Ref. 9). The NRC's OGC has issued several internal position papers on the standing of FSARs and the NRC's abilities to and options for enforcing information within FSARs.

The task group's analysis of enforcement actions shows that the FSAR forms less than 15 percent of the enforcement process. In the violations, the FSAR generally is used as one of several documents in a hierarchy of documents that the licensee failed to adhere to in violating the requirement being cited. Very few notices of deviation have been issued for noncompliance with commitments, either FSAR commitments or others.

Recommendations:

The latest OGC position papers need to be reviewed and understood and used to revise enforcement guidance and practices that are consistent with the positions. Should the reference to FSARs in the operating license prove to have significance, consideration would then need to be given to changing those licenses that do not make direct reference to the FSAR.

4.3.2 Documenting Minor Violations

The enforcement program recognizes that although some situations will have such minimal significance as to be unimportant, they still may be technically violations of requirements. The enforcement program guidance was recently changed to permit inspectors to refrain from documenting such situations. The program also allows, under certain conditions, documenting violations of low significance in inspection reports, but not citing them in a notice of violation.

Several of the reviews at Millstone found that minor violations played no role in identifying the issues at Millstone. However, the staff's review of FSAR-related inspection findings found that a great majority of FSAR discrepancies are minimally significant and may be minor violations.

Recommendation:

Resolution of policy issues according to what information should be in FSARs and what information may be removed from FSARs could eliminate much information that has little significance and could reduce FSAR-related violations that have no safety significance.

4.4 Licensee Reporting

4.4.1 Differences in Terms Within Reporting Regulations

The NRC's regulations require licensees to report certain conditions that are outside of the plant's design basis or that are unanalyzed conditions (Sections 50.72 and 50.73), and to request NRC approval before making changes that involve unreviewed safety questions (Section 50.59). Although "unreviewed safety question" is explained in the rule, "unanalyzed condition" is not. Examples of what the staff considers unanalyzed conditions are found in NUREG-1022. The relationship between unreviewed safety question and unanalyzed condition has not been articulated in agency guidance. Current guidance to the staff and industry only discusses the applicability of a Section 50.59 evaluation to a *de facto* change or to a change or modification the licensee plans to take that would resolve a degraded or nonconforming condition. Such a condition may have been reportable under Sections 50.72 and 50.73.

The NRC Enforcement Manual recognizes conditions that may never have conformed to the FSAR as *de facto* changes that are applicable to Section 50.59. The draft enforcement guidance for FSAR discrepancies would consider not reporting an issue that involves an unreviewed safety question as a Level 3 escalated enforcement issue.

Recommendations:

The agency needs to determine the relevance of Section 50.59 and evaluations for unreviewed safety questions to existing or as-found conditions in plants. After determining relevancy, new guidance needs to be developed or existing guidance modified to clearly establish actions the agency expects licensees to take in resolving degraded or nonconforming conditions, including the role of Section 50.59.

4.4.2 Importance of Design Bases in Reporting Requirements

Design basis is defined in 10 CFR 50.2 and is a subset of the licensing basis because the FSAR, the basic licensing document, presents the design basis for the facility. (See Section 3.1.3, above for a further discussion of design bases and relationship to licensing bases.) Four of the agency's reporting regulations contain requirements for licensees to report design discrepancies. A clear understanding of a plant's design basis is important for adequately meeting these reporting requirements for several reasons: (1) it is the base from which design changes are made, (2) it is the point from which a determination can be made that a condition is outside of the design basis for reporting under Sections 50.72 and

50.73, and (3) it is necessary for determining safety margins for evaluating changes to the facility for unreviewed safety questions under Section 50.59.

NU's event analysis concluded that the licensee staff did not have a clear understanding of Millstone Unit 1's design basis and did not maintain its design-basis documents up to date as quality-related documents. The continuing level of design-related LERs and the large contribution of NRC activities in initiating such LERs, indicates that a number of licensees lack a clear understanding of design bases.

Recommendations:

The agency needs to consider if it needs to do more to ensure that licensees understand the design bases and use them appropriately. The agency should place a priority on adding guidance to and issuing the latest draft of NUREG-1022.

4.5 Management Issues

The task group reviewed four issues that were applicable to several of the four general areas. Although the issues were not related to policy, they did have management implications. These issues are discussed below.

4.5.1 Verifying Implementation of Management Expectations

The NRC has formal processes in place communicating management expectations through directives, procedures, manuals, and internal memoranda. The staff's various reviews and the task group's evaluations found several areas in which expectations had not been fully met, or that were not completely understood by the staff. Among these areas were several PM responsibilities described in the PM's Handbook and in Inspection Procedure 37001, follow-up of some inspection findings, incorporation of plant-specific licensing actions and activities into the inspection program, and implementation of Section 50.71(e).

Recommendation:

NRC management needs to assure that its objectives and expectations are clearly stated, understood, and complied with. Agency downsizing will reduce the number of managers and supervisors who will be available to oversee staff activities and will place greater reliance on the staff to make its own decisions. Therefore, management needs to have systems in place that measure compliance with agency objectives. The responsibilities for staff positions need to be clearly established and the guidance for meeting the responsibilities should be clear, consistently documented and perpetuated, and periodically reviewed for relevance.

4.5.2 Qualification of Individuals With Inspection or Review Responsibilities

Inspectors are trained and qualified in general areas of inspection to the requirements in the inspection program. Requirements for formal education, training, or experience basic to the technical aspects of the inspection function are among the qualifiers for the position. Specialized training is provided as needed. Management then is responsible for assigning appropriately qualified individuals to specific inspections. However, on-the-job training is minimally addressed in the inspection program.

The mandatory technical training for PMs and NRR technical reviewers is described in a 1989 NRR memorandum (Ref. 10). The comprehensive list of available training is specified for PMs and technical branches according to areas of responsibility. This training includes reading assignments, on-the-job training assignments, formal training, specialized technical training, and rotational assignments. Included in on-the-job training assignments is a requirement to observe a fuel reload. This requirement is specified for PMs but is not specified for any other technical position.

The agency's policy and administrative guidance for employee, supervisory, management, and executive training and development is in Management Directive (MD) 10.77 (Ref. 11). The training is administered for NRC offices by the Office of Personnel (OP), except for "specialized" technical training that is developed and administered by AEOD. This MD is the former NRC Manual Chapter 4150, which has undergone only minor changes since 1984. It was last changed in 1987 to recognize responsibilities and delegations of authority to conform with the NRC reorganization that year. The current NRR-wide process that accounts for the status or completion of PM and technical reviewer training is not up to date and is awaiting the establishment of a data system by OP; thus the task group could not determine the level of compliance with the mandatory training.

The SIT found several examples of incorrect or incomplete technical conclusions, or failure to fully develop relevant issues, for issues that were previously inspected or reviewed by the NRC. Specific examples are discussed in Sections 6.1.7, below.

The task group's survey of inspectors found that, in general, on-the-job training and prior experience each provides a third of the information inspectors rely on in performing the technical aspects of their jobs. The survey of PMs indicated that a majority of them feel they need training to accomplish their inspection responsibilities for overseeing licensees' Section 50.59 programs, and many do not have the depth of experience gained from bringing a plant through licensing or from extended assignment to one plant. These findings emphasize the value of recruiting experienced personnel and identifying and cultivating prior experience.

Recommendations

The agency needs to determine if its employees with inspection and review responsibilities have all the necessary knowledge and skills to independently verify the acceptability of design-related actions, and whether that knowledge and skills base needs to be developed further. The task group concludes that the training requirements for such personnel should be evaluated to ensure it includes the appropriate mix of formal training and on-the-job training commensurate with employees' past experience, and that mechanisms are in place to ensure perpetuation of training requirements. In addition, the task group concludes that formal qualification process for inspectors does not sufficiently address on-the-job training.

4.5.3 Using Every Management Tool Available

In its report on the staff's actions in response to self-assessments conducted by NU in 1991, the OIG concluded that the NRC should have acted more aggressively against NU and Millstone. The NRC had been documenting a decline in performance at the site since 1991 and discussed one or all Millstone units at each senior management meeting except one since June 1991. Although the agency was taking extraordinary actions, such as

establishing a management oversight group and holding meetings between agency senior managers and NU's board of trustees, the agency did not conduct a diagnostic evaluation of the plant and was slow to place the plant on the agency's watch list, even after a notable event with an isolation valve in the reactor coolant system in 1993.

In contrast, the South Texas Project was discussed at only two senior management meetings (January 1991 and January 1993) before a diagnostic evaluation was performed, and the plant was placed on the watch list at the next meeting following a notable event (auxiliary feedwater problems) at the plant (Ref. 12).

A parallel between the South Texas Project Task Force findings and the findings of the various activities surrounding Millstone is that the NRC was aware of many of the problems at both plants. Issues were being documented in inspection reports and discussed in Systematic Assessment of Licensee Performance (SALP) reports. At the South Texas Project, the agency was slow to recognize the licensee's poor implementation of corrective actions; at Millstone, the agency did not recognize the full implications of the licensee's poor implementation of corrective actions.

Another contributor to the staff's slow response to conditions at the plants may have been its reliance on the licensee's commitments. NU addressed its problems with various task groups, enhancement programs, and changes in management, and the staff wanted to give NU's address of its problems sufficient time to change plant performance. Although the staff's oversight of the licensee's programs was finding problems with implementation, the NRC neither sent a diagnostic evaluation team to the site to determine root causes, nor did it place the plant on the agency's watch list when the plant was unable to improve performance. The agency apparently focused its attention on the licensee's processes, not on the results of the processes.

The task group found that the understanding some inspectors have of timeliness requirements for closing open items can prevent regional managers from using the Inspection Followup System to gain insights into potential problems with licensee performance or issues with adequate NRC inspection resources. The task group's findings on inspection followup are discussed in more detail in section 4.1.3, above.

Recommendations:

Recent changes to the senior management meeting and plant performance review processes have added structure and more objective criteria to those processes. Implementation of these changes and their effectiveness in identifying plants of concern and focusing agency attention on them should continue.

Any review of the use of the Inspection Followup System (IFS) by the Inspection Program Branch should include its use as a management tool. See the recommendation in Section 4.1.3, above.

4.5.4 Agency Databases

In several reviews, including this one, the staff encountered problems with databases available. For example, the SIT was unable to locate pertinent licensing-basis and design-basis documents through NUDOCS, the agency's current document management system.

The team had to rely on the licensee's more effective and more efficient system. Similarly, to gather the information in a timely manner, the staff members who reviewed spent fuel pool design bases had to rely on documents provided by some licensees. The task group could not find many early safety system functional inspection (SSFI) reports through the NUDOCs or the 766 System, which collected inspection data before 1991. The agency recognized significant problems with the quality of data in the IFS and the 766 System, and in 1993 contracted support for the agency's efforts to correct the data within the systems. The support will likely continue through February 1997.

The task group's largest frustration came from trying to identify and analyze enforcement actions below the level of escalated actions. The data retrieved from the IFS, which replaced the 766 System in 1991, provided reliable statistical information but did not provide details of the specific enforcement actions. Therefore, it was not possible to determine in what context references to FSARs were used in notices of violations. Retrieving similar pre-1991 data from the 766 System was an overwhelming task. Although 766 System contained the text of enforcement actions, the report given to the task group by the agency's contractor consisted of approximately 12,000 pages. So much data caused the task group to analyze the enforcement data for only a handful of plants. Late in its review, the task group became aware of enforcement information within the Standard Review Plan Update and Development Program's Text Retrieval System, which is based on a commercially available database of NRC regulatory documents. That database, a word-searchable document database, suggests that it contains the text of notices of violation and deviations for all nuclear power plants back to 1988. However, the task group found that in several cases the database contained only one violation for a plant for a given year although many more had been issued. The missing data made all the enforcement data in the system questionable and the task group could draw only very general conclusions about the data.

In many cases, the staff needed to review the actual document in the agency's official files because the text of the document was not in a document database.

Recommendations:

The agency needs to continue its efforts to produce better information databases to allow the staff to locate pertinent documents and information. The Automated Inspection Reporting System currently being developed, will create a database for all inspection findings; and the agency is pursuing a system to upgrade the agency's overall document management database. These efforts need to meet the agency's basic need for easily retrieving accurate information in light of an environment of reduced funding, fewer managers for oversight, and fewer positions to administer the systems and assure data accuracy.

4.6 Policy-Related Issues

The findings of the various activities surrounding issues raised by Millstone raised questions concerning various aspects of licensing basis, design basis, maintenance of the bases, and reporting issues related to the bases. The first questions raised are "What should be the licensing basis for an operating plant and where should it be located so it is accessible to the licensee, the NRC, and the public?" NRC's Office of the General Counsel (OGC) over the years has issued position papers for the Commission on the standing and

enforceability of final safety analysis reports based on the FSAR's role in initial licensing, and "current licensing basis" was defined by the agency when it promulgated the license renewal rule, 10 CFR Part 54. The task group found that (1) the concepts of licensing basis and design basis are not clearly understood by some licensees and NRC staff; (2) both licensees and staff have difficulty identifying and locating bases documents; and (3) bases documents are not always appropriately used in NRC licensing and inspection activities and in licensee design and facility changes.

A related question is "What information should be in the FSAR?" The contents of FSARs, as part of an application for an operating license, are established in 10 CFR 50.34 and Regulatory Guide 1.70. The information required to be in periodic updates of FSARs is stated in Section 50.71(e). However, in its various reviews the staff has found that some information which should be in updated FSARs has not been updated. It has also found that information which the staff has relied on in ensuring that licensees are in compliance with new rules and in approving licensing actions or other licensing activities has not been captured in documents that would require some evaluation by the licensee before the licensee is able to change it. The NRC recognized that commitments in licensing bases, but not contained in the FSAR or license, were not controlled by a defined regulatory process. In December 1995, the staff endorsed an industry commitment management process that licensees may use to change such commitments.

A question raised about the design basis is "Has the NRC done enough to ensure that the design basis is sufficiently understood and is being used properly?" The FSAR is to include the design basis for each facility, but NRC team inspections had found that licensees did not have sufficient documentation to adequately support their design basis for subsequent plant changes and modifications. The agency issued a policy statement in 1992 and relied on an industry initiative to identify and, in some cases, reconstitute design documents that were key to the plants' designs.

Another policy question related to FSARs is "What information, if any, may licensees remove from their FSARs without a corresponding change to the facility?" The FSAR is the basic document upon which the operating license was issued, and it is not possible to reconstruct what information the staff relied upon at the time of licensing. Also, the FSAR is the analysis and design basis from which the technical specifications have been derived. Removing information from FSARs could possibly affect data used to establish a design feature or an operating limit (e.g., a technical specification).

Another policy question related to maintaining the licensing basis is "What should be the scope and threshold of Section 50.59?" In the past, the agency took a narrow interpretation of the words "as described in the safety analysis report." The industry's guidance on Section 50.59 processes interprets the words more broadly. Section 50.59 allows licensees to make changes to their facilities (as described in the safety analysis report) without having to get NRC approval unless the change involves an unreviewed safety question or a change to a technical specification. Limiting Section 50.59 to only safety analysis report descriptions may not be sufficient because a lot of licensing-basis information for operating plants now exists in documents other than the FSAR. Conversely, the agency has broadly interpreted the words "margin of safety as defined in the basis for any technical specification" to include a number of licensing-basis documents in determining the margin of safety.

An issue, also related to the scope of Section 50.59, is "Should the agency more formally establish its position on the actions a licensee should take after identifying degraded or nonconforming conditions?" Generic Letter 91-18 alerted licensees to agency guidance for NRC inspectors being added to the agency's inspection program, but the generic letter did not require any action by licensees. The guidance discussed actions based on prompt corrective activities in accordance with quality assurance requirements (10 CFR Part 50, Appendix B, Criterion XVI, "Corrective actions") and only addressed Section 50.59 as it relates to changes or modifications the licensee may make that potentially could resolve the nonconforming or degraded condition. Section 50.59 is a prospective regulation that allows licensees to make changes to their facilities, as described in the safety analysis report, after an evaluation for the presence of an unreviewed safety question. Conditions that never met the descriptions within the safety analysis report have been interpreted to be *de facto* changes and subject to the requirements of Section 50.59. However, it is not clear if conditions that have deteriorated under normal operating conditions and have become degraded or "as found" nonconforming conditions should be subjected to a Section 50.59 evaluation after the condition has been evaluated for operability, reportability, and effects of technical specification conditions, although some licensees and NRC staff have been applying Section 50.59 in this manner.

4.7 Potential Implications for License Renewal

The license renewal rule, 10 CFR Part 54 (60 FR 22461), is founded on two fundamental principles. The first principle is: "[W]ith the possible exception of the detrimental effects of aging on the functionality of certain plant systems, structures, and components in the period of extended operation and possibly a few other issues related to safety only during extended operation, the regulatory process is adequate to ensure that the licensing bases of all currently operating plants provides and maintains an acceptable level of safety so that operation will not be inimical to public health and safety or common defense and security." The second principle is: "[T]he plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term." Also, in developing the license renewal rule, the Commission concluded a petition for hearing may be filed in accordance with 10 CFR 2.758 and that the "limits on the scope of renewal review and hearing are based on careful review of the sufficiency of the NRC regulatory process to resolve issues not considered in renewal." (60 FR 22482)

As discussed elsewhere in this report, the NRC staff has found that some licensees have failed to (1) implement an effective corrective action program, (2) appropriately maintain or adhere to plant licensing and design bases information, (3) comply with the terms and conditions of licenses and NRC regulations, and (4) assure that UFSARs properly reflect the facilities. These findings raise potential questions regarding the adequacy and implementation of the current regulatory process and thus, could potentially impact the underpinning of the license renewal rule. Further, the potential questions on the adequacy and implementation of the current regulatory process could provide grounds for a petition under 10 CFR 2.758.

The regulatory assurance for the NRC conclusions in the license renewal rulemaking that licensees continue to comply with their licensing basis rests on two factors: (1) licensee programs required by the NRC's rules and regulations to assure continued safe operation and (2) NRC's regulatory oversight programs. Licensee programs include design

modification, maintenance, surveillance, quality assurance, safety assessment, and corrective action programs. These programs are relied upon to assure that the equipment and facility operations remain within acceptable limits and that equipment will work when actually called upon under transient and accident conditions. The NRC oversight activities, which include licensing, inspection, performance assessment, enforcement, operating events assessment, and generic issues programs, are implemented to assure that current operations are consistent with rules, regulations, and license conditions, and that the licensing basis is modified as necessary to assure continued safe operation. The inspection program in particular is designed to obtain sufficient information on licensee performance, through direct observation and verification of licensee activities, to determine whether the facility is being operated safely, to determine whether licensee management control is effective and to ascertain whether there is reasonable assurance that the licensee is in compliance with regulatory requirements.

Recommendation:

The potential impact on license renewal of the apparent deficiencies in current regulatory processes and their implementation, as identified in this report, need to be evaluated. This evaluation should include whether additional assurance by licensees or the NRC is needed prior to license renewal with respect to the adequacy of implementation of current or future regulatory processes to assure an acceptable level of safety in those areas not subject to review under 10 CFR Part 54.

5 STAFF ACTIONS AND RESOLUTION OF OIG INVESTIGATION FINDINGS

In this chapter is a discussion of actions the staff has already taken and actions the staff plans to take to address some of the specific issues raised by several related OIG reports.

5.1 Summary of OIG Findings

In December 1995, the OIG issued a case report on NRC's regulation of Millstone Unit Unit 1 (Ref. 13). This investigation principally addressed an allegation that the NRC staff had allowed Northeast Utilities to conduct refueling operations outside of Millstone Unit 1's FSAR. The OIG also determined that, although the staff was generally aware of NU's practice of offloading the entire core at Millstone Unit 1 during refueling outages, the staff did not realize that this practice was inconsistent with the Millstone Unit 1 FSAR. In a later case report (issued May 31, 1996) on Millstone, the OIG concluded that even with increased NRC inspections and evaluations, deficiencies identified at Millstone in the 1991 self-assessments persisted, and that the NRC staff allowed an excessive amount of time for Northeast Utilities' proposed corrective actions to take effect (Ref. 14). The May 31 report also concluded that the NRC's regulatory framework allowed a licensee to selectively control the information available to the public by requesting Section 2.790 withholding for documents that reflected poorly on the licensee and by not requesting withholding for self-assessments that portray the licensee in a favorable manner.

Finally, a May 8, 1996, OIG report on the NRC staff's actions at Maine Yankee addressed several issues including: (1) weakness in the staff's review process for the RELAP5YA computer code and the plant-specific application of the code, (2) role of the NRR PM in the overall NRC regulatory program and the definition of interfaces between PMs and resident

inspectors, (3) the role and performance of NRC management oversight in the reactor program, (4) the implications of the authenticity of the staff's tracking of the status of implementation of TMI action items, (5) lack of a formal licensing commitment tracking system, and (6) that NRR does not have a policy on staff documenting and retaining documentation of conversations with licensees, placing the agency in a position of having to rely on the licensee's documentation when inquiring into past events (Ref. 15).

5.2 Staff Actions

The staff responded to the May 8, 1996, OIG event inquiry at Maine Yankee in SECY-96-135 in June 1996 (Ref. 16). In the paper, the staff described how it had addressed many of the issues raised in the OIG report, even before it was issued. Among the actions included forming a team within the Office of Nuclear Reactor Regulation (NRR) to determine the lessons learned from the problems identified at Maine Yankee Atomic Power Station and providing recommendations for improving the staff's processes. The team was directed to address such issues as (1) the technical review processes for computer code applications and for power uprate amendment requests; (2) coordination between technical and projects staff, including technical staff concurrence; (3) delegation of signature authority; (4) tracking and verifying licensee commitments; and (5) closeout of selected TMI Action Plan items for all plants with potential vulnerabilities similar to those identified at Maine Yankee.

On May 20, 1996, a half-day workshop was conducted within the NRR Divisions of Reactor Projects for operating reactor PMs and project directors that addressed many of the concerns raised in the OIG report regarding project management processes. Additional workshops are planned to be conducted periodically. A second workshop was held on September 3, 1996, to ensure that operating reactor PMs and project directors are familiar with the issues that have been raised and with the status of corrective actions. As processes and procedures evolve to resolve these issues, the periodic project manager training forum will be used to communicate management's expectations.

Some of the issues addressed in the OIG report for Maine Yankee were also discussed at the June 4-5, 1996, Senior Management Meeting. This meeting was an important forum for discussing lessons learned and expectations among the senior agency managers. Further, on June 11, 1996, the Associate Director for Projects (ADPR), NRR, met with Senior Executive Service (SES) managers in the Divisions of Reactor Projects to discuss areas warranting process improvements and the status of progress of ongoing improvement initiatives. Among the areas discussed were tracking and verifying licensee commitments, concurrence and signature authority on correspondence, and the need for formality in verbal and written communication with licensees. NRR staff also discussed ongoing initiatives during the counterpart meeting with directors from the regional Divisions of Reactor Projects on July 15-16, 1996.

As discussed in SECY-96-135, the staff is preparing a process improvement plan to ensure the ongoing development of guidance and procedures is completed, forwarded to the staff, and implemented. The ADPR Process Improvement Plan will capture commitments and initiatives underway in the Divisions of Reactor Projects to clarify and update existing guidance, and to address lessons learned at Millstone and Maine Yankee. It is intended that the Process Improvement Plan will be a living document, and will be sent to the Commission upon issuance. To ensure the workability and appropriateness of guidance

being developed, a Project Manager/Project Director Advisory Panel was established with representatives from the Divisions of Reactor Projects I/II and Reactor Projects III/IV to gain peer review of draft procedure changes and guidance.

Another initiative, now complete, was the installation of an electronic version of the PM's Handbook on the local area network (LAN). The PM's Handbook was placed on the LAN so that guidance to the Divisions of Reactor Projects staff could be consolidated in one location, allowing easy review and access to relevant guidance, and promulgated to the projects staff in an expeditious manner. The PM's Handbook is readily accessible to all agency staff. As a longer term effort, the staff recognized the need to completely update the PM's Handbook. The staff has initiated efforts to have all relevant guidance researched and to have the handbook comprehensively updated, including the use of hypertext links to appropriate documents referenced in the revised handbook. Consequently, when a referenced document is updated or revised, the PM's Handbook will reference the most recent version of the document.

The staff also earlier recognized the need to provide clarifying guidance to the staff on internal processes, where guidance either was sparse or was outdated. A number of these issues are also captured on the ADPR Process Improvement Plan to ensure that these issues are reviewed, and that guidance is developed and implemented as appropriate. Among these various issues are clarifying guidance on the handling of informal communications, scheduling drop-in visits, handling of task interface agreements, and updating procedures for processing license amendments.

Many of the issues on the ADPR Process Improvement Plan were discussed by the Associate Director for Projects with the PMs at the May 20th PM Workshop, the June 11th meeting with SES managers in the Divisions of Reactor Projects, and the Division of Reactor Projects Counterpart Meeting held on July 15-16, 1996. In addition, the ADPR Process Improvement Plan was forwarded to and discussed with regional management to ensure their understanding of where regional interfaces may occur, and to inform them about ongoing activities in NRR. The staff will report progress on this initiative with six-month progress reports.

5.3 OIG Investigation Findings and Staff Resolutions

The nine issues that follow summarize the concerns and staff actions identified in the following OIG reports related to Maine Yankee and Millstone:

- NRC Failure to Adequately Regulate - Millstone Unit 1, Case No. 95-771, December 21, 1995
- NRC Staff's Actions Related to Regulation at Maine Yankee, Case No. 96-04S, May 8, 1996
- NRC Staff Actions to Address Northeast Utilities System (NU) 1991 Self-Assessments, Case No. 96-02S, May 31, 1996

Issue 1

The first issue from the Maine Yankee OIG report addressed the weakness in the staff's review process with respect to the conduct of separate reviews for the RELAP5YA computer code and the plant-specific application of the code.

Response 1

In SECY-96-135, its response to the OIG report, the staff discussed its development of a team and a plan to address actions related to the Maine Yankee experience involving the inappropriate use of the RELAP5YA code for analyses in justification for power uprate. The Maine Yankee lessons-learned team is evaluating (1) the staff's review of submittal of various computer codes for consistency in approach and quality of review, and is determining the need to standardize the review process; (2) the code modification review process and followup of licensee and vendor implementation; and (3) options for a catalogue of codes and related approvals, limitations, and conditions. In addition to those evaluations related to computer code reviews, the lessons-learned team is reviewing all completed power uprate safety evaluations to determine whether the scope of the review was adequate.

The staff also noted in SECY-96-135 that separate reviews for the code and the plant-specific application of the code do not necessarily represent a weakness in the review process. Since many codes are generic (e.g., RELAP5YA could have been used for both Maine Yankee and Yankee Rowe), separating the code review from the review of the plant-specific application of the code can achieve important savings. In its review, the staff is evaluating whether reviews of plant-specific applications of codes at other plants receive appropriate technical attention. Staff efforts are continuing on this issue.

Issue 2

The second issue addressed the role of the NRR PM in the overall NRC regulatory program and the definition of interfaces between project managers and resident inspectors.

Response 2

As was discussed in SECY-96-135, the PM is a key participant in the regulatory process. The NRR project manager is the focal point in NRR for information regarding the assigned plant and is the principal point of contact for NRR with the associated region and the licensee for activities related to the assigned facility. As such, the PM routinely works with the NRR technical staff, regional staff, and resident inspector staff on issues related to licensing activities, licensee safety performance, and event response and followup. Agency guidance exists that defines the primary importance for the PM in establishing direct and frequent lines of communication with the regional office and the resident inspectors regarding regional and headquarters activities, and with licensee management for the PM to be fully informed about all significant inspection and operational activities regarding the assigned project.

The staff has begun several initiatives to examine the various aspects of the project management function in carrying out the agency's mission. Two major studies are being conducted that are expected to provide insights into the role of the PM, including the

relationship between the PM and regional and resident inspectors. Both studies are characterized as "job task and functional analyses." The first study will examine the regional Divisions of Reactor Projects, which includes the resident inspector offices; the second will examine the NRR Divisions of Reactor Projects, with a focus on the PM. These studies also will examine the relationships between staff and management in both headquarters and the regions. The staff's final response to the OIG report will address specific aspects of the relationships between the PM and the technical staff, the region, and the licensee as they relate to this case and will identify corrective actions taken.

The PM workshop on May 20, 1996, addressed many of the concerns identified in the OIG report regarding project management processes. At that time, the Associate Director for Projects stressed to the PMs the importance of good communications with their regional counterparts, especially with the resident inspectors. PMs were also instructed to discuss licensing issues and related commitments warranting staff followup with the residents so that the residents were knowledgeable of ongoing staff actions. This guidance will be reviewed and further clarified as appropriate as part of the ADPR Process Improvement Plan.

Issue 3

The third issue addressed the implications of the OIG report on the role and performance of NRC management oversight in the reactor program.

Response 3

The staff noted in SECY-96-135 that the need to improve performance, as demonstrated by staff performance at Maine Yankee and Millstone, was discussed by the Executive Director for Operations in detail at the June 1996 Senior Management Meeting.

One finding in the OIG report on the staff's actions related to Maine Yankee was that the author of the letter in question did not follow the established practice of obtaining NRR technical staff review; that the established concurrence format of the Project Directorate was not followed; that a unilateral decision regarding the closure of TMI Item II.K.3.31 was made; and that the closeout letter was vague and subject to misinterpretation.

SECY-96-135 discussed the staff's revising the delegation of signature authority (NRR Office Letter 101, Revision 10, "Delegation of Signature Authority") to ensure appropriate independent review of a document. The PM's Handbook also was revised and this guidance was disseminated to the Projects staff. The staff will also examine the instructions for concurrences and signature authority and will recommend additional changes, as appropriate, to ensure that the proper management oversight is exercised before similar letters are issued, particularly in light of agency downsizing and the reduction in management positions. These items are captured in the ADPR Process Improvement Plan for followup. The staff's activities are intended to ensure that the process weaknesses which facilitated the bypassing of appropriate management oversight in the Maine Yankee case are corrected.

The OIG report on Maine Yankee also concluded that NRC managers on the distribution list for the letter that closed out TMI Item II.K.3.31 for Maine Yankee had an opportunity to evaluate the adequacy of the letter. As noted in SECY-96-135, it is the staff's

longstanding practice that general distribution after issuance is for information only; appropriate management oversight is to be assured by the concurrence process.

The December 21, 1995, OIG report on Millstone concluded that the staff had several opportunities to review the licensee's refueling practices and heat removal capability of the spent fuel pool cooling system. The OIG concluded that the staff did not conduct a fully adequate evaluation. The staff has reviewed the limitations of the Standard Review Plan (SRP) on fuel pool cooling systems and concluded that the SRP is not clear on the appropriate consideration of other more likely operational events, such as a full-core offload performed at the end of a planned operating cycle. Although the Millstone experience revealed that the staff was aware of the end-of-cycle full-core offloads, the SRP would not have caused them to focus on this issue. The staff intends to revise the SRP to address this issue.

Additionally, the Millstone experience revealed inconsistencies in management's expectations with respect to the expected knowledge level and familiarity of the staff with the FSAR. On January 26, 1996, NRR issued "Short-Term Review of Updated Final Safety Analysis Report (UFSAR) Commitments," to all regional offices to supplement the existing level of FSAR reviews that were performed during routine NRC inspections. The revised guidance required inspectors to verify selected UFSAR commitments by reviewing the applicable portions of the FSAR during routine inspection preparation and verifying that the commitments had been properly implemented into plant practices, procedures, and design. This information was documented in the inspection report, with review and follow-up by NRR staff. By memorandum dated March 15, 1996, the regions were requested to follow the January 26, 1996, guidance indefinitely, pending a permanent change to the Inspection Manual.

On March 18, 1996, the staff issued Information Notice 96-17, "Reactor Operation Inconsistent With the Updated Final Safety Analysis Report," to alert licensees to instances of reactor operation that may not conform to the licensing basis. The information notice attached a copy of the Executive Summary of the licensee's event response team report, identifying a number of fundamental factors that led to an inaccurate UFSAR for Millstone Unit 1.

During the May 20th PM Workshop, the Associate Director for Projects discussed the project managers' need to be familiar with the licensing basis and FSAR for their plant. Further, the Inspection Program Branch has discussed program expectations at regional resident counterpart meetings, and the Chief, Inspection Program Branch has discussed program office expectations during recent trips to the regional offices. Finally, on June 6, 1996, in his memorandum to staff on "NRR Staff Performance Expectations," the Director, NRR reminded staff members that it is their responsibility, in conjunction with regional staff, to evaluate licensee compliance with the licensing basis of the plant, and to use licensing-basis information in their decision-making process.

It is recognized that additional guidance is needed in this area. As part of the ADPR Process Improvement Plan, the staff will review existing guidance in the PM's Handbook and Office Letter 803, "Technical Specifications Review Procedures," which discuss the project manager's responsibility to be familiar with the content of the FSAR, and the use of the licensee's UFSAR and other docketed correspondence in determining the scope of the review.

Issue 4

Issue 4 addressed the implications of the OIG report on the authenticity of the staff's tracking of the status of implementation of TMI Action Plan Items.

Response 4

The OIG report on Maine Yankee concluded that the staff had overlooked the closeout of TMI Item II.K.3.31, and that numerous members of the staff had several opportunities to prevent the erroneous closure of TMI Item II.K.3.31.

As was discussed in SECY-96-135, the staff has implemented a plan to review the closeout of three TMI Action Plan Items (II.K.3.5, II.K.3.30, and II.K.3.31) for all applicable plants to identify potential problem areas, including technical staff and management oversight involvement, staff verification of closeout, and documentation. The team will review any identified problem areas and make recommendations regarding the need to broaden the scope of the review and the need for process or procedure changes. The team is charged with examining current PM guidance for technical staff coordination and concurrence, examine signature authority with respect to superseding previous staff positions and requirements, and examining current PM guidance regarding how to track licensees' commitments for licensing applications. Efforts are under way in this area.

Issue 5

The fifth issue addressed the staff's missed occasion to note Millstone's declining performance and place the plant on the NRC's Watch List.

Response 5

The May 31, 1996, OIG report concluded that, even with increased NRC inspections and evaluations, the deficiencies identified at Millstone in the 1991 self-assessments persisted, and that the NRC staff allowed NU an excessive amount of time for its proposed corrective actions to take effect, neutralizing the staff's willingness to take prompt, aggressive action.

The NRC continually monitors and assesses the performance of nuclear plant licensees to verify that plants are operated safely, and it continually analyzes operational data to identify safety issues and degradations in performance. The primary programs and processes that the NRC uses includes the inspection program, plant performance reviews (PPRs), integrated performance assessment process, systematic assessment of licensee performance (SALP), performance indicators (PIs) and accident sequence precursor programs, operational safety data reviews, and senior management meetings (SMMs).

The staff recently made improvements to the SMM process, and sent their recommendations to the Commission in SECY-96-093 (Ref. 17). This Commission paper forwarded draft management directives on SMMs and on evaluating the operational safety performance of nuclear power plants. The primary goal of the SMM, as well as the other evaluative processes, is to identify declining trends in the operational safety performance of individual plants so that early corrective actions can be taken. SECY-96-093 provided additional structure to the preparations for, and conduct of, among other

issues, SMMs—articulating the assumptions and criteria that are used to evaluate the safety performance of nuclear power plants and providing greater openness to the industry and public about the overall NRC evaluation process.

Also as discussed in SECY-96-093, the staff developed the SMM Nuclear Power Plant Performance Evaluation Template, which was incorporated into the draft SMM management directive, to clearly articulate the assumptions used by senior managers to place plants on the Watch List. During the SMM preparation phase, regional staff will address the relevant template factors in developing the narrative summaries of performance for each plant to be discussed at the meeting. The information for the template will derive from the agency's several evaluative processes and will incorporate a variety of quantitative and qualitative indicators.

The use of the template to evaluate each plant discussed in the SMM will serve as a common baseline by which the senior managers can evaluate operational safety performance. This baseline will foster objective evaluation of all plants by the senior managers, in conjunction with the plant's narrative summary, data summary, performance indicators, and the plant issues matrix.

The staff also prepared guidance to standardize the implementation of the evaluation processes among the regions and headquarters, which was discussed in SECY-96-093. The PPR is used to perform an integrated assessment of licensee safety performance so that trends can be identified, and to review the current inspection plan for each plant to determine if changes are needed, considering the assessment results.

Plant performance will be evaluated at the SMM by the senior managers using the information contained in the SMM Executive Summary, and discussions will be guided by the Performance Evaluation Template or the Watch List removal matrix, as applicable. To aid in arriving at an independent and objective view of a plant's operational safety performance, senior managers can also refer to the inspection data in the plant issues matrix.

In addition to establishing criteria, the draft SMM management directive provides for the use of the same standardized inspection information at PPRs, SMM screening meetings, and the SMM itself. This standardized inspection information is contained in the recently introduced plant issues list (now called the plant issues matrix (PIM)). The PIM is a plant-specific historical listing of inspection findings, licensee event reports, and other publicly available information that provides objective information for use in assessing plant performance. The SMM process will focus on the most safety-significant issues on the PIM.

The draft management directive on the use of the PIM and performance evaluation matrix will be used on a pilot basis for the next SMM. Feedback on the process and use of these new tools will be evaluated and fed back into the SMM process, and will also apply to finalizing the draft management directive.

The staff also has NRC performance indicators available as another tool to provide consistency and an independent review criteria. PIs are a collection and evaluation of eight indicators of licensee performance gathered from operating data reported by licensees, and include plant-specific and industry-wide trends and are used to identify areas of poor or

declining performance; they should not be used to rank plants or to imply status for individual plants. AEOD will continue to evaluate the development of indicators that can provide a bases for judging whether a plant should be placed on or removed from the Watch List. Finally, AEOD has retained an independent management consultant to observe how information is gathered and used by the SMM process, and to provide feedback to the agency.

The development of the management directives and PPR guidance has added much structure to the NRC's evaluative processes, ranging from the PPR up through the SMM. The standardization of these evaluative activities throughout the NRC fosters objectivity in plant performance evaluations, and the criteria that have been developed publicly establish explicit benchmarks to assess the safety performance of all plants. The staff will make improvements to the process based on the feedback from the various reviews, pilot studies, and lessons learned.

Issue 6

The sixth issue addressed the licensee's control of information released to the public under 10 CFR 2.790.

Response 6

The May 31, 1996, OIG report concluded that the NRC's regulatory framework allows a licensee to selectively control the information available to the public by requesting Section 2.790 withholding for documents that reflect poorly on the licensee and by not requesting withholding for self-assessments that portray the licensee favorably.

10 CFR 2.790(a) states that subject to the provisions of paragraphs (b) and (d) of this section, final NRC records and documents, including, but not limited to, correspondence to and from the NRC, in the absence of a compelling reason for nondisclosure after a balancing of the interests of the person or agency urging nondisclosure and the public interest in disclosure, be exempt from disclosure and will be made available for inspection and copying in the NRC Public Document Room, except for matters that are trade secrets and commercial or financial information obtained from a person and privileged or confidential.

In 1991, the time of the Millstone's self-assessments, self-assessments could be withheld from public disclosure under 10 CFR 2.790. At that time, case law recognized that self-critical analyses legitimately were covered under comparable provisions of Freedom of Information Act 5 USC 552(b)(4) for withholding from public disclosure. Case law changed the interpretation of an exemption to withholding information in 1992 with *Critical Mass Energy Project versus NRC*. Self-assessments are now scrutinized pursuant to the test set out in *Critical Mass Energy Project versus NRC*.

Additionally, the NRC's policy is to review each document individually under 10 CFR 2.790 to determine whether the information contained within the document should be exempt from disclosure because it contains trade secrets and commercial or financial information obtained from a person and privileged or confidential information. The NRC does not review documents to determine whether the documents portray the licensee in a favorable light or not.

Issue 7

Issue 7 addressed the NRC staff's requirements and tools for licensee commitment tracking and for documenting conversations with licensees.

Response 7

The May 8, 1996, OIG report noted that the staff does not track licensee commitments credited by the NRC as a condition of approval of the licensee's request. The report also noted that the staff did not have and does not presently have a formal licensing commitment tracking system and that the NRC places too much reliance on licensees for information.

The NRC recognizes that agency processes in the area of verifying plant-specific commitments are not commensurate with our expectations for ensuring the implementation of those commitments that the staff relies upon when making regulatory decisions. The May 20 PM Workshop addressed the need to adequately identify, document, and track licensee commitments and conditions related to the staff's acceptance of licensing proposals. As discussed in SECY-96-135, the NRR staff is developing a Licensing Action Closeout Form to identify and document safety-significant commitments in licensing action requests and requirements imposed by the NRC as a condition of approval of the licensee's request. This form will be included with licensing action/activity packages during the concurrence process, and will be maintained.

The staff is reviewing options to modify NRC processes to clearly identify those licensee commitments that the staff relied on to make regulatory decisions, and is requesting that those commitments which the staff identifies as significant be included in the next FSAR update. This would entail possibly modifying the cover letter that forwards the staff's safety evaluation in response to the licensee's request.

Finally, the staff is reviewing the development of an inspection procedure, or some other process, to (1) define the mechanism for following up on licensee commitments, (2) determine the appropriate office to conduct the verification, and (3) improve communications between NRR and the regions for followup verification. The staff also intends to review existing tracking systems to determine their acceptability to track implementation and verification of regulatory commitments.

The NRC endorsed Nuclear Energy Institute (NEI) guidance on managing commitments made to the NRC (Ref. 18). The guidance describes a process that licensees can use to modify or delete commitments and defines the circumstances under which interaction with the staff is appropriate. The use of this guidance can reduce unnecessary interactions between the licensee and the staff and can, without unnecessary staff involvement, provide licensees with a level of confidence and the flexibility to modify or delete commitments that have been shown to be inefficient or ineffective. Policy issues related to redefining current licensing basis, location of the basis, and identifying regulatory significant commitments made to the agency, may require the agency to reconsider codifying processes for changing commitments.

Although the use of the NEI guideline by licensees is not mandatory, indications are that many licensees intend to incorporate the NEI guideline in their procedures. In SECY-95-300, the staff told the Commission that the licensee-specific programs would be monitored to verify that commitments are being appropriately controlled. If the inspection process shows that a significant number of licensees do not implement the NEI guidance in full, or have not adopted some equivalent level of control and documentation of changes to their commitments, the staff will reassess the need to promulgate staff guidance or initiate rulemaking. The inspection is guidance being developed and has not yet been issued.

The NRC expects licensees to fulfill their commitments to the NRC. However, the staff recognizes the need to independently verify implementation of and to followup on commitments for plant-specific issues. The staff has initiated actions to perform a technical review and assessment of the current licensing basis (CLB) for the Millstone Unit 1 nuclear power generating station. This represents a pilot effort to develop and demonstrate a process that will (1) identify each NRC regulatory requirement and each commitment made by the utility, as reflected in the docket file for Millstone Unit 1, (2) identify the linkages between documents that establish the history of the requirements and subsequent commitments, and (3) identify the current status of each commitment, to the extent possible. Selected parts of the docket file are being electronically scanned.

The NRC recognizes that agency processes are not commensurate with its expectations for ensuring the implementation of those commitments on which the staff relies when making regulatory decisions. To determine the extent of licensee implementation of commitments made to the NRC, NRR will examine various options to ascertain what type of past review of licensing tasks would be most appropriate. On the basis of existing processes in place to review licensee commitments in the areas of generic issues and in the inspection program (TMI Action Plan Items, Unresolved Safety Issues, Generic Safety Issues, responses to notices of violations, and licensee event reports), the review will focus on plant-specific issues. Also, existing processes will be reviewed and strengthened as necessary.

The most appropriate method to review the implementation of past commitments could focus on those licensing tasks closed in the past 12 to 18 months, the conduct of a pilot program of selected issues at diverse types of facilities, or a review of commitments based on risk significance or critical decisions for the agency. In their decisionmaking, the staff may not have relied on commitments made with submittal of licensing requests. Therefore, criteria should be developed to determine the types of commitments that the staff will confirm as implemented.

One option to verify past commitments would be a review of commitments made by licensees with submittal of licensing requests within the past 12-18 months or within any definitive time frame. This review, based on a set time frame, may not yield safety-significant findings or be the most effective use of staff resources. There now exists an industry-wide process for changing commitments, and with the higher emphasis that the staff is placing on implementation of commitments, there is higher confidence that newer commitments are being implemented and tracked. This would possibly skew the staff's findings. Going back to a defined time period may not yield accurate results because time sometimes obviates the need for some commitments. Commitments may have been implemented, then undone for a myriad of reasons, such as hardware changes, reconfiguration of the system, or the problem that caused the need for the commitment

may not have recurred, negating the need for the commitment, and the commitment was deleted.

An additional option would be a review of past commitments based on pilot programs at various facilities. The facilities would be selected on the basis of performance, type of plant, and other factors selected by the NRC. A pilot program or an audit at a number of diverse facilities would provide a sound sampling of facilities, and provide a cross-section of programs and processes to review.

Another alternative would be to review issues on the basis of risk significance, focusing on those issues that would have an impact in the initiating event or the operability of front line systems necessary to respond to the initiating event (i.e., those issues that would increase the frequency of initiating events or decrease the reliability of front line systems). Risk insights could be chosen selectively for classes of plants (Mark I, B&W, etc.). A variation of this alternative would be to choose issues either in addition to or in lieu of risk significance that the agency considers critical to safety. Such issues could include low-temperature overpressure protection (LTOP) and anticipated transient without scram (ATWS).

Depending on the results of the verification effort, a determination will be made as to whether further action is appropriate.

Issue 8

The May 8, 1996, OIG report pointed out examples of the staff's inadequate documentation, of significant discussions/conversations with licensee personnel

Response 8

The May 8 OIG report concluded that NRR does not have a policy on how the staff documents and retains documentation of conversations with licensees, and that the lack of such documentation placed the agency in a position of having to rely on the licensee's documentation when inquiring into past events. As part of this finding, the OIG inquiry revealed that the staff failed to document one of the agency's significant decisions.

It is the staff's policy that all documentation reviewed as part of a staff decision is to be recorded in the staff's safety evaluation and placed in the Public Document Room unless requested and exempted from public disclosure in accordance with 10 CFR 2.790. Telephone conversations with licensees and the public should be appropriately documented. Adequate records should be maintained consistent with established procedures, which control the official agency record system. These points were reiterated to the staff in the Director, NRR's June 6, 1996, "NRR Staff Performance Expectations."

In the May 20 PM Workshop, the Associate Director for Projects stressed the need to adequately document significant discussions and conversations with licensee personnel. The Associate Director for Projects also reminded the Project Directors in the ADPR SES meeting of the need to ensure documentation of agency decisions, and to follow agency policy on documenting phone conversations. In addition, instructions are being developed for the NRR staff on the need to document significant discussions and conversations with licensee personnel. These instructions will be distributed to the NRR staff, and captured in

the PM's Handbook for staff reference. As appropriate, this issue will be addressed further in future PM training. In addition, some regions have issued similar guidance and the staff recognizes the need to coordinate these efforts.

Finally, the Director, NRR, in his June 6, 1996, "NRR Staff Performance Expectations," reminded the staff that although we expect licensees to give us full and accurate information, it is important that we verify that information and verify implementation of commitments made to us to focus the basis of regulatory decisions. It is important that we adhere to our regulatory processes.

Issue 9

The ninth issue addressed NU's operation of Millstone Unit 1 outside of its design basis.

Response 9

In its December 21, 1995, report, the OIG identified a potential violation. The OIG found that, for approximately 10 years, operation of the shutdown cooling system during full core offloads had been in a configuration not described in an operating procedure. Additionally, although not identified as a potential violation, the OIG reported that the licensee operated Millstone Unit 1 outside its design basis due to its practice of offloading the entire core in less time than was analyzed in the FSAR.

The staff reviewed the issue underlying the OIG statement that the licensee operated Millstone Unit 1 outside its design basis due to its practice of offloading the entire core in less time than was analyzed in the FSAR. In Licensee Event Report (LER) 93-011, issued on October 18, 1993, the licensee reported the possibility of exceeding the spent fuel pool's 150-degree F temperature limit following a full-core offload beginning 150 hours after reactor shutdown (assuming a single active equipment failure). The licensee revised LER 93-011 (LER 93-011-01) on December 27, 1995. In this revision, the licensee listed offload start and completion times for every plant refueling outage, reporting that the offloads were started before the time delays discussed in the FSAR, and that they were outside their design bases. The NRC has conducted inspections in this area, recorded a noncited violation, and continues to follow up on aspects of the issue.

In order to measure the extent to which problems encountered at Millstone Unit 1 regarding compliance with the FSAR existed at other facilities, the staff initiated two activities. First, the staff compared the current refueling practices against the licensing basis (drawn from the FSAR, technical specifications, license amendments, and other docketed correspondence) for decay heat removal from spent fuel pools for all operating reactors. The second activity was to review licensee compliance with other aspects of the facility description contained in the FSAR through revised NRC inspection guidance. This activity is described more fully in Issue 3. The staff completed its review of core offload practices for each operating reactor, and forwarded the results to the Commission on May 21, 1996 (Ref. 19). The results of the review of the spent fuel licensing basis were also discussed with the Commission on May 31, 1996. In summary, the staff concluded that, although refueling practices at some plants may have been inconsistent with their licensing bases, all plants have spent fuel pool cooling systems and backup cooling capabilities that the NRC staff had reviewed and approved, and system design

features and licensee operating practices were found to be adequate in assuring protection for public health and safety.

Additionally, the staff completed actions on a spent fuel pool action plan, which includes recommendations for performance-based rulemaking in this area. This action plan was prepared to review technical issues related to the spent fuel pool. The staff's report was sent to the Commission on July 26, 1996 (Ref. 20).

The December 21, 1995, OIG report also concluded that, generally, NRC staff was aware of NU's practice of offloading the entire core at Millstone Unit 1 during refueling outages; however, the NRC staff did not realize that this practice was inconsistent with the normal discharge scenario outlined in the FSAR, and they did not question the licensee's practice of offloading the entire core.

6 DETAILS OF NRC REVIEW

The following sections describe the task group's review of each of the four general areas: inspection, licensing, enforcement, and licensee reporting.

6.1 Review of NRC Inspection Process

6.1.1 Use of the FSAR in the Reactor Inspection Program

The use of the safety analysis report (SAR) and the design bases in the reactor inspection program differed depending on the status of the nuclear power plant (construction and initial licensing versus operations).

Before licensing a power reactor facility for operations, the NRC inspection program directed significant staff attention toward verifying that the plant was designed and constructed in accordance with NRC regulations and that the as-built plant conformed to the design bases and the description in the SAR. Some examples of specific program requirements are:

- (1) Inspection Manual Chapter (IMC) 2512, the inspection program for construction contained:
 - Temporary Instruction (TI) 2512-07, "Construction Assessment Team Inspections." This TI stated that the SAR "defines requirements and commitments." The SAR was used as the main source of information for this inspection.
 - Inspection Procedure (IP) 37051, "Verification of As-Builts," in part, determined whether "Changes from the original design (or SAR) were properly reviewed and approved."
- (2) IMC 2513, the inspection program for preoperational testing and operational readiness accomplished the following:
 - Defined the minimum inspection program to determine the readiness to issue a license. This IMC also referred to Regulatory Guide (RG) 1.68, "Initial Test

Programs for Water Cooled Reactor Plants," to determine the required testing. RG 1.68 refers back to the final safety analysis report (FSAR) as the source of required pre-operational tests.

- IP 37301, "Comparison of As-Built Plant to FSAR Description," required that selected fluid and mechanical systems be reviewed to determine that the physical installation was in agreement with piping and instrumentation drawings contained in the FSAR. Also a sample of control and logic instrumentation systems had to be reviewed to determine they conform to the description in the FSAR.
- (3) IMC 2530, "Integrated Design Inspection Program," was also used to gain additional assurance that the design process for a license applicant's facility implemented NRC regulations and the design commitments made in the FSAR.

In general, the SAR was relied upon as a primary source document in most of the construction inspection program documents.

Once a plant received a full-power license, the role of the SAR in the inspection program greatly diminished. After licensing, other materials (technical specifications and operating procedures) were the significant documents to be used during inspections. Presently, the SAR is mentioned in only 4 of the 18 core inspection procedures of the IMC 2515 inspection program for operating reactors. These references typically direct the inspector to the FSAR as a source of general information along with a wide range of other regulatory documents, such as technical specifications and 10 CFR Part 50.

This situation is logical because the FSAR's usefulness in an operational setting is minimal, assuming that pertinent operational design attributes have been correctly translated into operational procedures or technical specifications. Following the design, construction, and initial licensing—activities that rely on the FSAR as the design-basis document and the predominant licensing-basis document—regulatory attention for plant operations relies on operationally oriented documents such as technical specifications and plant procedures. The FSAR's primary usefulness at this point resides in any continuing licensing activities required as a result of needed license amendments or in the determination that licensing activities are not needed via the 10 CFR 50.59 process. Accordingly, the inspection program pays specific attention to design issues and the Section 50.59 process. However, the inspection program had no component to verify that the FSAR was being maintained as an accurate description of the design basis. The Section 50.59 process presumed that the FSAR accurately described the design basis. The FSAR also became less useful in operations because licensees were not required to update them until 1980, and a number of licensees failed to keep the UFSAR current as required by Section 50.71(e) after 1980. In addition, the agency and industry had not interpreted the requirements of Section 50.71(e) to require including new commitments and design bases for rules, generic communications, enforcement actions, or plant events (Ref. 7).

As part of the task group's survey of inspectors (Appendix B to this report), it asked the following question to determine inspector practices with regard to the frequency of use of FSARs: "Prior to the recent specific guidance on the FSAR as it relates to inspection activities, how often did you consult/review the plant specific FSAR?" About 40 percent of the approximately 375 site- and region-based inspectors responded to the survey. Of

those who did respond, 43 percent said they frequently consulted or used the FSAR during inspection activities. Another 24 percent stated they routinely used the FSAR. However, 33 percent stated that they rarely consulted the FSAR. Although the question did not inquire about the FSAR's purpose or usefulness to the inspectors, a majority indicated at least routine usage.

Contrary to the actual use of the FSAR in an operational setting is RG 1.70 (Ref. 21). In the introduction to RG 1.70, the staff states that the SAR "is the basic document used by NRC inspectors to determine whether the facility is being constructed and operated within the licensed conditions." Although this assertion correctly characterizes the role of the FSAR during construction and testing, it misstates the importance of the FSAR in inspecting operating facilities for the reasons stated above. The RG was last revised in 1978, two years before the FSAR update rule was issued, at a time when licensees were not required to keep their FSARs up-to-date and accurately reflecting the plant's configuration.

As a result of the FSAR issues revealed at Millstone, interim inspection program guidance was issued in early 1996 to direct inspectors to review related portions of the site FSAR during the preparation of all reactor inspections and to document the results of the inspection emphasis in inspection reports. The purpose for this was to estimate the amount and significance of plant physical and operational differences with the FSAR. During three months of this increased inspection attention to FSAR content, many discrepancies were identified. These issues are assessed in an EDO memorandum to the Commission that will be issued presently.

The inspection shift from reliance on the FSAR during the initial licensing process to technical specifications during operations assumes that pertinent operational information and design limitations have been correctly translated from the FSAR into the technical specifications and facility operating procedures. The task group found that this assumption was incorrect in at least one situation, however.

When the staff surveyed the spent fuel pool licensing bases, it found that the potential for the Millstone Unit 1 issue of fuel offload to the spent fuel pool before the time delay design assumption in the FSAR existed at 16 other units. The task group determined that the technical specifications for at least one of these units contained a limiting condition for operation (LCO) for decay time after shutdown before fuel movement that was significantly less limiting than the FSAR assumption. Specifically, the LCO for this plant required that the reactor be shut down for only 24 hours⁴ before moving fuel. This LCO is found in the old standard technical specifications but not in improved standard technical specifications. The basis for this LCO is a dropped fuel bundle accident. However, similar to Millstone, the design of the spent fuel pool cooling system assumed that core offload does not commence for 5 days. This created a situation in which the LCO was not the "limiting" condition. The differing basis for the conflicting time period is unimportant to the reasonable expectation that the most limiting condition for operation would be included in technical specifications, thereby bounding any other related but less limiting conditions. Discussions with the Technical Specifications Branch in NRR indicated that the decay time

⁴Twenty-four hours is typical for boiling water reactors having this LCO. Typical times for Westinghouse pressurized water reactors having this LCO is 100 hours.

was not included in the improved standard technical specifications because it did not meet the criteria of Section 50.36 and its relationship to shutdown risk.

The task group concluded that the interim requirements for increased inspection attention to information contained in the FSAR should be made permanent. Further, these requirements should be considered for application to other pertinent licensing documents.

The task group also concluded that the potential exists for other operationally oriented design assumptions to be more limiting than technical specification LCOs. Consideration should be given to assess this potential.

6.1.2 Inspection Process for 10 CFR 50.59

The inspection program focuses inspection of a licensee's Section 50.59 process through several inspection procedures. Engineering, modification, and design-related inspection procedures contain guidance to evaluate identified modifications for proper application of Section 50.59. In addition, IP 37001 specifically evaluates the licensee's Section 50.59 process. However, the task group found some weaknesses in the inspection program for Section 50.59.

IP 37001, "10 CFR 50.59 Safety Evaluation Program," first issued in 1992, specifies that it is intended to be performed by the NRR PM for the facility. This IP contains guidance for program evaluation and for specific application of Section 50.59 to selected plant modifications. The IMC change notice that issued the IP contains the following statement, which is reiterated in the guidance section of the procedure:

IP 37001 is issued to provide guidance in evaluating licensee compliance with the requirements of Section 50.59. Guidance for inspecting 50.59 implementation has been included in the inspection program in various inspection procedures and in the 10 CFR guidance section of the NRC Inspection Manual, but has never been the principal focus of any one inspection procedure. By providing focus, this procedure emphasizes the importance of Section 50.59 to safety and promotes more consistent and effective NRC inspections of Section 50.59 implementation.

The staff's review of Section 50.59 processes and the task group's survey of PMs noted the following weaknesses: (1) PMs have insufficient training and inspection experience to perform an adequate inspection, (2) the IP is not part of the core inspection program and is infrequently performed, and (3) the IP directs the inspector to review modifications for which Section 50.59 applicability was formally considered and does not contain requirements to assess a common licensee pitfall of failing to properly recognize Section 50.59 applicability during unplanned activities.

In contrast, the Section 50.59 component of engineering, modifications, and design-related inspections, performed primarily by region-based engineering and technical support specialists, have been successful in identifying Section 50.59 issues. These inspections make up a portion of the core inspection program, are frequently performed, and are the inspection procedures referred to in the change notice remarks, above. However, since these inspections focus primarily on planned and completed modifications, they are also effectively limited to circumstances in which Section 50.59 applicability was formally

considered. During these inspections, the in-depth evaluations of specific hardware changes and the associated engineering calculations can be useful in determining the overall adequacy of the licensee's engineering activities.

The major inspection activity to evaluate Section 50.59 applicability to individual plant issues and events is routine resident inspector observations. The majority of all Section 50.59 inspection findings involve issues noted by resident inspectors during day-to-day monitoring of plant activities. By observing plant activities first-hand, the residents have the opportunity to detect those occasions where licensees improperly determine that 10 CFR 50.59 was not applicable. This is the exclusive domain of the resident staff and cannot reasonably be accomplished by any other inspection activity. The success of this inspection activity has been documented in numerous inspection reports and citations of violations. This success is achieved even though the residents' primary inspection procedure, IP 71707, "Plant Operations," contains no reference to Section 50.59 nor any guidance to inspect this licensee activity.

The task group concluded that inspections of licensees' Section 50.59 programs and implementation should be assigned in two parts to existing engineering inspection procedures such as IP 37551, "Onsite Engineering" and to the existing resident operations inspection procedure, IP 71707, "Operations."

6.1.3 Compliance-Based vs. Performance-Based Inspection

When the inspection program originated before 1975, the standards were centered on compliance with regulations. Over time, and due to many influences, the standards evolved to emphasis on safety first with literal compliance becoming secondary. Overemphasis on safety or misunderstanding of the NRC's current regulatory philosophy known as "performance based" inspection and regulation may have contributed to situations like the Millstone 1 spent fuel pool issue in that, issues involving noncompliance with regulations and licensee commitments that have little if any safety consequences, are not emphasized in deference to "real" problems. Also noncompliance issues would not usually be pursued in the enforcement process unless direct, credible, adverse safety consequences could result.

Before 1975, the inspection program focused most of its attention on (1) determining whether licensees were in compliance with NRC regulations and (2) the establishment and implementation of a quality assurance program. During this early period, plant licensing and construction-related activities far exceeded operating reactor activities. NRC inspections emphasized documentation review because adequate and valid documentation was a primary resource for licensing evaluations. Also, emphasizing documentation review, coupled with some observation of in-process work activities (mostly construction) was deemed an appropriate way to judge acceptability from a sampling standpoint. This program philosophy was in consideration of the relatively small inspection work force and the existence of the licensees' independent quality assurance programs. Consistent with this philosophy was that inspectors traveled to multiple sites from regional offices and could not reasonably expect to always be present to witness construction activities necessary to verify certain quality attributes. The sporadic presence of construction inspectors on site made it unlikely that inspectors would discover a quality problem on their own (Ref. 22). Thus, because the early inspection program was designed to audit licensees on a sampling basis and to use the agency's limited inspection resources for

verifying the licensee's processes to perform work, "compliance based" inspection prevailed out of necessity. The inspection program still is an auditing process and, consistent with the licensing process, intends to provide reasonable assurance that licensees are fulfilling their responsibilities for safe operation of their facilities.

Implementation of the inspection program relied on inspectors who had previous experience in reactor construction and operations, and the inspection program was written to reflect that degree of inspector experience. Early criticism of the program followed four consistent themes: (1) there are too few NRC inspections; (2) inspectors spend too little time actually at the plant; (3) even when on site, inspectors spend too much time reviewing paperwork instead of observing actual work or observing and conducting tests and measurements; and (4) there is not enough evaluation of licensee performance with appropriate NRC response (Ref. 23).

In 1977, the Commission approved modifications to the inspection program that stationed resident inspectors on site. Also included were:

- a national performance appraisal capability comprising three elements: (1) evaluation of the performance of NRC licensees from a national perspective; (2) an evaluation of the effectiveness of the NRC inspection program; and (3) confirmation of the objectivity of the NRC inspectors
- a significant extension of direct verification of licensee activities by NRC inspectors that involves more direct measurement and increased observation of activities and tests in progress
- an expanded training program to meet the needs of the revised inspection program providing a balance between formal classroom instruction and on-the-job training for the new inspector (Ref. 23).

Despite the 1977 modifications, in 1978 a General Accounting Office (GAO) report found that NRC inspectors did little independent testing of construction work, relied heavily on the utility's self-evaluation, spent little time observing ongoing construction work, and did not communicate routinely with people who did the actual construction work. A similar situation was noted in NRC inspections of operating plants (Ref. 24).

In April 1984, the Ford Amendment Study (NUREG-1055) explored the causes of major quality-related problems in plant construction. Regarding the NRC's inspection program, the study concluded:

NRC's past quality assurance efforts have focused on form and paper at the expense of implementation and evaluating quality of completed work, and they should be reoriented to emphasize performance and effectiveness. The inspection program should assess the issue of management capability and effectiveness on a routine basis, not just when the need for remedial action has become apparent.

The Ford Amendment Study was focused exclusively on plant construction. By this time, the agency had gained significant experience in inspecting operational reactors, including fully implementing the resident inspector program.

The experience of task group members and discussions with early resident inspectors indicated that, during the early 1980's, inspections by residents had been evolving from reviewing records and the quality assurance process to become more "real time" monitoring of licensee activities. This was especially true for plant operations. In doing this, the inspections were becoming less compliance oriented, starting the inspections not with verifying requirements but with reviewing the results of licensee activities. Once adverse or undesirable results were revealed or observed, inspections could become diagnostic, reviewing unfavorable outcomes to determine causes, and ultimately, identifying any noncompliance with requirements. Working at the same site every day and becoming familiar with site operating personnel and site procedures naturally led the residents to become more oriented to in-process inspection. As operational issues arose, the resident staffs became aware of the issues from their close proximity and did not have to rely on official licensee notification or reports to begin following up on the issues. Resident inspectors who effectively investigated operational events in this manner were conducting what is now known as "performance based" inspection.

One result of the Ford Amendment Study, SECY-87-220, communicated the staff's intended shift in emphasis from "compliance based" inspections of licensees' quality verification organizations to "performance oriented" inspections of these organizations (Ref. 25). This emphasis sought to assess whether licensee quality verification organizations were providing licensees with an effective and independent internal capability to detect problems and appears to be one of the early program maneuvers toward emphasizing what is now known as licensee corrective action programs. The policy issue was directed primarily at licensee quality assurance (QA) capabilities, but also had applicability to NRC inspections in other areas. Although SECY-87-220 called this a "reorientation of NRC inspection efforts," in fact, performance-oriented inspections had evolved to be the routine practice for most inspectors for many years, especially for operating plants. Hence, the policy was catching up to the practice.

Concurrent with increasing emphasis on performance-based inspections was increasing emphasis on "safety significance" of inspection findings. Inspectors were directed to be safety inspectors, not merely compliance inspectors. An unintended result was emphasis on safety significance at the expense of verification of compliance with regulations. To some inspectors, this direction officially sanctioned what they had been doing all along. Thus, the emphasis on safety and performance-based inspections, coupled with the perceived de-emphasis on compliance, contributed to an inspection environment in which compliance, absent safety concerns, was less important.

In this inspection culture, somewhere behind the defined and permanent line of noncompliance, there developed a fuzzy second line, less defined and always dependent on inspector judgment, that separates "safety significant" from "not safety significant." The proper line between these two has never been clearly established for the inspection staff. However, this correlation may be unavoidably elusive among the complex requirements of a complex technology that has relied, and should rely, heavily on the judgment of the individual inspector.

As a result of the Millstone issues, the standard of compliance in the inspection and regulatory culture is being reevaluated. The inspection program's emphasis on safety, its reliance on finding performance problems before investigating the underlying programmatic issues, and its audit nature of only overseeing a portion of the licensees' activities may

have deemphasized the regulatory significance of compliance. In order for compliance and safety to more closely converge, regulations must be interpreted or be rewritten to permit performance-based, results-oriented implementation and verification.

The task group concluded that inspectors need more guidance in the area of performance-based inspection and in the proper emphasis between compliance with regulations and safety. Emphasis should remain on development of performance-based approaches for new regulations and should continue on performance-based changes to existing regulations.

6.1.4 Use of the Design Basis in the Reactor Inspection Program

During the licensee's design process for reactors, NRC's design verification process was subsumed within the initial licensing review, i.e., "inspections" of design results compared to design bases was very limited outside of the licensing process. The NRC prioritized its limited inspection resources to address operations first, construction second, and design last. Contributing to this prioritization was a shortage of inspectors technically qualified to review the design process, and a perception that design engineers did not need NRC inspection oversight as much as construction workers did. The Ford Amendment Study concluded that this prioritization "resulted in an almost total neglect of design and the design process" (Ref. 22).

As a result, design-related inspections during construction took place only to the extent that the physical installations were in conformance to design specifications and that proper engineering processes were in place for managing field changes. Inspection procedures for these areas were limited to the following:

- IP 37051 Verification of As-Built (issued April 1980)
- IP 37055 Onsite Design Activities (issued July 1980)
- IP 37301 Comparison of As-Built Plant to FSAR Description (issued October 1977)

IP 37301 performed a visual, physical comparison of 50 percent of systems covered by technical specifications to the description contained in the FSAR. This comparison was effectively limited to layout comparisons and, thus, did not encompass other design details that could not be visually verified. For example, the FSAR (design bases) identified the seismic qualification standards. A visual walk down of a particular system against the FSAR description would be insufficient to verify that the as-built seismic design conformed to the design requirements.

The regulations and early processes of the AEC included a great deal of conservatism. The AEC was finding it difficult to develop reasonable design and component standards as a consequence of the evolving technology combined with little operating experience upon which to base those standards. As a result, new safety questions were raised on practically every application. The industry, meanwhile, lacking specific criteria to follow, submitted general and incomplete applications in attempts to avoid a detailed analysis of its designs. The regulatory staff was forced to make its decisions cautiously, conservatively, and subjectively on a reactor-by-reactor basis (Ref. 26).

Subsequent to licensing, the inspection program focused on maintaining the design bases by inspecting those activities that could inappropriately modify the plant and depart from the design bases. Among the inspection procedures are:

- IP 37001 10 CFR 50.59 Safety Evaluation Program (initially issued December 1992)
- IP 37550 Engineering (initially issued March 1994)
- IP 37551 Onsite Engineering (initially issued March 1994)
- IP 37700 Design Changes and Modifications (initially issued January 1975)
- IP 37701 Facility Modifications (initially issued October 1976)
- IP 37702 Design Changes and Modifications Program (initially issued January 1979)
- IP 37828 Installation and Testing of Modifications (initially issued September 1976)

After the TMI accident and subsequent issues that arose in the early 1980's, concerns came up involving the adequacy of design details as compared to design bases. One result of this concern was the decision to perform design inspections. NRC IMC 2530, "Integrated Design Inspection Program" (IDI Program), was issued in 1985 to guide these inspections (some IDI inspections took place much earlier). The objective of this program was the following:

The objective of the IDI program is to gain additional assurance that the design process for a selected facility effectively implemented NRC regulations and the design commitments made in the FSAR. The inspections encompass the total design and architectural criteria through the development of the design details. The inspection should:

- a. Verify that regulatory requirements and design bases as specified in the license application, are correctly implemented in specifications, drawings, calculations, and procedures.
- b. Verify that the correct design information has been provided to the responsible design organizations.
- c. Verify that design engineers have sufficient technical guidance and experience to perform assigned engineering functions.
- d. Verify that design controls, as applied to the original design, have also been applied to design changes, including field changes.

Beginning in the mid-1980's, the NRC and the industry began focusing on shortcomings involving the maintenance of well-defined design bases and the availability of the necessary supporting design documentation. This interest resulted, in part, from events

such as the Davis-Besse loss-of-feedwater event in 1985. As a result, the NRC began highly focused, "vertical slice," safety system functional inspections (SSFIs) in late-1985 and consistently found that utilities had not adequately maintained well-defined design bases, nor had they maintained adequate supporting design analyses or final design output documents (Ref. 27).

Continuing through the late-1980's and into the early 1990's, the NRC conducted many team inspections similar to SSFIs that examined the design bases of various systems or of the plant in general against the as-built and as-operated plant. These inspections included safety system outage modification inspections, electrical distribution system functional inspections, service water operational performance inspections, and broader-based diagnostic evaluation team inspections. Team inspections were considered to be such highly effective inspection tools that they were recognized as an important element of the inspection program when the program was revised in 1988. Included in the revision was the intent to place increased emphasis on team inspections. (Ref. 28)

The task group reviewed numerous early SSFI reports. In general, the SSFIs raised many design issues. These issues predominantly were related to as-built and as-operated systems that did not conform to design details or engineering specifications. Many issues involved faulty design calculations and other design errors uncovered during review of design documents. The FSAR was sometimes directly cited in the SSFI reports as a basis for comparison, but the prevalent standards for comparison were design standards and design details not specifically included in the FSAR, but frequently included by reference. This is consistent with the status of the FSAR being the design bases rather than the design details. Section 50.59 issues were frequently identified.

Throughout the early SSFI reports, it was apparent to the task group that the FSAR was not the "starting point" for inspection; rather the FSAR served as a standard only to the extent that other, more detailed design information was not available. One case in particular was identified that characterized the general standing of the FSAR at the time when in 1987, an SSFI team took issue with a licensee actually using the FSAR as a design-basis document (Ref. 29). The report stated:

The FSAR is intended to be a document which describes the commitments of the licensee on features and operations of the plant which are pertinent to nuclear safety. It is not necessarily a true and complete reflection of the design basis of the plant in that (1) it is often less conservative than the actual design basis, (2) it is often not complete with respect to the design features it does address, and (3) it does not address many of the design features and parameters for the plant. Although it is an important source of information, it should not be considered as the design basis for the plant unless it has been developed and maintained as such in a controlled manner.

The licensee's FSAR has not been developed or controlled as a design basis document. It does not accurately reflect the design basis of the plant as evidenced by two examples which were discovered during this inspection....

The licensee's technical staff was using the FSAR as a design basis document, as evidenced through conversations with a number of the licensee's technical personnel and through references in design documents to

the FSAR as a basis for the design. An example of incorrectly citing the FSAR as a source of design basis information is the incomplete safety-related "A" battery load listing....

Resolution of the licensee's control of calculations and technical staff's awareness that the FSAR is not a complete design basis document will be identified as inspector followup item....

Partly as a result of the NRC's increased focus on design-basis issues during this period many utilities embarked on programs to reconstitute design documents. As the number of SSFIs initiated by the regions increased, licensees also began performing assessments comparable to SSFIs. This was reflected in the inspection program by a decrease in the number of headquarters-led SSFIs. The program was also adjusted when the NRC became confident that effective corrective actions had been implemented by licensees. Thus, in the broader programmatic context, the focus of the inspection program changed as licensee activities changed to ensure that inspection resources were used efficiently and effectively (Ref. 28). However, consistent with the agency's policy on such processes, the results of licensees' design-bases reconstitution processes were not systematically inspected.

The staff studied a sample of design basis reconstitution programs and published its findings in NUREG-1397 in April 1991. The study did not draw overall conclusions on the industry's performance of design control and configuration management because its survey was limited. However, the study did identify strengths and weaknesses in the various approaches of different utilities and differentiated between programs that actually reconstruct missing design information (design document reconstitution) and the summarization of design-basis information for systems (design-bases documents). The staff also found that the programs it surveyed uniformly did not verify or validate the information in the design-bases documents developed by the licensees. NU's Event Response Team Report, ACR 7007, characterized the Millstone program as follows:

The Design Basis Reconstruction (DBR) Program as carried out in the Design Basis Documentation Packages (DBDPs) successfully implemented its program objectives by compiling and summarizing the available design basis information for selected systems. However, the program was hampered by its limited scope and constrained by budgetary limitations throughout its development and implementation. The final program scope did not fully comply with INPO good practice recommendations in the area of physical verification of plant configuration, verification of selected design data and reconstruction of the basis for design data where such documentation was not available. Also, the program's name, "Design Basis Reconstruction Program," may have led to a misunderstanding of the program scope by outside agencies when it was referenced in Licensing correspondence.

The number of team inspections began to decrease in 1990 based on industry response to design-basis issues, but also as a result of the Regulatory Impact Survey conducted in 1989. The survey cited team inspections as being overly burdensome to licensees. In 1990, NRR provided guidance to the regions discouraging inspections of licensee self-initiated design-basis reconstitution programs (Ref. 30). Team inspections decreased from approximately 135 in 1990 to 61 in 1995.

The task group found that the vertical slice inspections begun in the 1980's were effective in identifying problems in design bases and design implementation. Findings of SSFI and other team inspections corroborate this conclusion. De-emphasis of vertical slice inspection strategies in the early 1990's reduced the agency's abilities to discover plants with such problems. Inspecting a facility's design basis and design basis implementation should be a continuing component of the operating reactor inspection program.

6.1.5 Closeout of Open Items and Verification of Licensee Corrective Actions

The Special Inspection Team (SIT) found that some licensee corrective actions resulting from regulatory issues, e.g., notices of violation (NOVs) and licensee event reports (LERs), had been "closed" in NRC tracking mechanisms but had never been completed by the licensee. In these cases, it appeared that the closing decision was based in part on the licensee's commitment to complete the corrective actions (Ref. 31).

The inspection program guidance for following up on inspection findings, including following up on licensees' corrective actions resulting from NOVs and LERs, is contained in the following inspection procedures:

- IP 90712 In-Office Review of Written Reports of Nonroutine Events at Power Reactor Facilities
- IP 92700 Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
- IP 92901 Followup—Plant Operations
- IP 92902 Followup—Maintenance
- IP 92903 Followup—Engineering
- IP 92904 Followup—Plant Support

IPs 90712 and 92700 are the procedures for following up on LERs (and other reports prepared by licensees) and IPs 92901 through 92904 are intended for followup of responses to violations and deviations as well as for followup of unresolved and other inspection-related open items. IPs 92901 through 92904 are identical procedures that exist individually only to account for inspection time by the four SALP functional areas.

In addition to followup of corrective actions, these procedures direct inspection of other event attributes, such as correct reporting to the NRC, determination of root cause, and determination of generic applicability. The strategy of the inspection followup process as directed in these procedures is for LERs, NOVs, and deviations to be screened for selection for further, detailed on-site inspection. The followup process expects that not all issues will be individually inspected. The selection is intended to be based on the significance of the event or issue.

The standard for following up on corrective actions differs between the IPs for written licensee reports and those for violations and deviations. The inspection requirements in IPs 90712 and 92700 for reported events are for appropriate corrective actions to have been

completed, in progress, or planned. The inspection requirements in the IPs for following up violations and deviations are corrective actions to be "fully implemented."

Regardless of the requirements stated in the individual IPs, NRC IMC 2515, "Light-Water Reactor Inspection Program — Operations Phase," provides the following guidance for performing IPs:

Each inspection procedure may contain many specific inspection requirements. These requirements are those matters that the inspector should consider in addressing the object of the inspection procedure. For core inspection procedures, all of which are required to be completed, the inspector is to perform the inspection requirements necessary for the inspector to conclude that the objectives of the inspection procedure have been met. In some cases, this may mean that a specific inspection requirement need not be addressed because the inspector is satisfied from examinations already conducted or from other information that indicates the licensee's activities are acceptable.

For inspections conducted under the plant-specific regional initiative and reactive inspection program elements (which includes the followup inspection procedures), there is no programmatic degree of completion that must be attained. Rather, the amount of inspection and the degree of completion should be commensurate with the purpose of conducting the particular inspection and should normally be planned before the inspection. This guidance has the affect of nullifying any specific IP requirements. Thus, a followup requirement for corrective actions to be "fully implemented" can be deemed by an inspector as not necessary to determine that the licensee's activities were acceptable. On the basis of the requirements in these IPs and the guidance in IMC 2515, the SIT finding that some NOVs and LERs were closed out before long-term corrective actions were completed are in conformance with the inspection program.

The task group included two questions in the inspector survey to determine the general practice for followup inspection and understanding of inspection program requirements. The survey asked inspectors to indicate the usual status of licensee corrective actions for items that they close and to indicate what their understanding is of the inspection program's requirements for this area. The survey results indicate a wide variation in both practice and understanding of requirements. There was a wide distribution of responses for required corrective action status covering the full range from actions "planned and scheduled, but not necessarily initiated" to "always fully complete" for both the usual status and perceived program requirements. This indicates that the contradictory program requirements have contributed to inconsistent inspection standards and that management oversight of program requirements and implementation has been insufficient.

A related discrepancy between inspection practice and program requirements was revealed. The intent of both LER and NOV followup inspection strategies is for followup to be performed on the basis of an informed sample. In practice, this is not done. As conducted, virtually all LERs and NOVs are considered in the sample and receive individual followup inspection with only a few LERs being closed "administratively." Although it may be advantageous in some respects to perform a 100-percent sample, this requires a compromise with the increasing demands for inspector resources. The findings of the SIT indicate that, by not verifying full implementation of corrective actions for those open

items that are followed up, the agency may miss indications of ineffective licensee processes.

Associated with the closeout of open items is the management of the plant-specific list of open items. More than half of the respondents to the inspector survey (53 percent) indicated they felt inordinate pressure to keep the open items backlog small. Of these, 57 percent indicated that reasonable accommodations are made for older items to remain open when necessary. Additionally, for LER and NOV corrective actions intentionally closed before full completion of corrective actions, the age of the issue was cited as the basis for closure 20 percent of the time. Two inspectors stated via amplifying comments that having a large number of open items at a site has had negative affects on an inspector's performance appraisals.

In order to ensure that open items are handled in a timely manner, regional management typically places a maximum 2-year limit for an item to remain open on the open items list. Some respondents incorrectly believed the time limit was imposed by the computerized tracking system, IFS. Other survey respondents indicated that this limitation can be avoided by closing an item while simultaneously opening an identical one with a new number to reset the clock. This "inspection workaround" and automatic closure of open items may have adverse impacts in that the new number masks the true age of an item. These practices can adversely affect management's ability to assess problems with licensees' implementation of corrective actions, or possible implications for inspection resources.

The task group reviewed the specific followup inspections of Millstone Unit 1 LER 93-11. This LER was the initial report of the full-core offload situation. The inspection followup was documented in three inspection reports, none of which officially closed the item, although a noncited violation was assigned in the earliest report. Because the task group did not have the complete information that would have otherwise been available to on-site inspectors, it did not reach an overall conclusion regarding the closeout action compared to program requirements. This issue is discussed in detail in a July 1996 OIG event inquiry report (Ref. 32).

Another conclusion of the SIT was that the corrective action program at Millstone was weak. This was not new information. This problem had been highlighted for a number of years by the inspection program and was documented in SALP reports and discussed at senior management meetings. However, the deficiencies identified by the SIT reveal that the depth of problems may not have been previously understood.

The inspection program assesses licensee corrective action programs in two ways. The first method is a continuous assessment through inspection of individual corrective actions related to NOVs and LERs (discussed above) and through day-to-day inspector observations of licensee activities associated with identification and correction of a variety of problems inherent in the operation and management of electric generating facilities. The second method is a broader programmatic review performed with IP 40500, "Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems." This inspection procedure is the evolutionary result of a performance-based approach to quality assurance inspection and has been generally effective in assessing overall corrective action programs. That weaknesses in corrective actions at Millstone were known to the NRC indicates that some combination of these two assessment methods was working.

If the NRC underestimates the extent of problems in the corrective action program at any site, a contributor may be the unwitting subversion of information created by emphasis of the 2-year limit for open item closeout. If this limit is mismanaged, in combination with the revealed inconsistent inspector standards for corrective action status and contradictory program requirements for completeness of corrective actions, the result may be significant underestimation of the effectiveness of a licensee's corrective action program.

The task group concluded that requirements for following up on licensee corrective actions associated with enforcement actions and reportable events should be clarified to provide consistent application. Attention is needed to ensure that a proper balance is obtained between timeliness of open item inspection and completeness of licensee corrective actions.

6.1.6 Inspection Program Requirements for Verification of Commitments

Requirements for verifying licensee commitments are varied. As discussed below, a significant difference exists between verifying commitments for site-specific and generic issues.

As previously discussed in Section 6.1.5, followup of open items is specifically addressed in the inspection program. Inasmuch as open items generated as a result of pending corrective actions included in responses to NOVs and included in LERs have been considered commitments, requirements for following up on these open items represent requirements for following up on commitments. However, since the program requirements for followup do not require full completion of corrective actions, equating "followup" to "verification" is not always warranted. In practice, and as indicated by the inspector survey, many inspectors verify full completeness of NOV and LER corrective actions for at least a portion of open items they close—especially for the most safety significant. Thus, program requirements for verification of commitments associated with NOVs and LERs is not definitive, although individual inspectors frequently perform full verification of commitments commensurate with the regulatory or safety significance of the item.

Licensee commitments made in response to generic issues, e.g., generic letters, bulletins, and new regulations, receive more structured attention within the inspection program. For example, as required by IMC 0720, during their development generic letters must be evaluated for consideration of issuing an associated temporary instruction (TI)—an issue-specific, "one time" inspection procedure to provide inspection requirements for verifying the licensees' disposition of the generic issue (Ref. 3). Licensee responses to generic letters and the resulting SERs typically include commitments made by the licensee or actions the staff expects the licensee to take. Accordingly, TIs prepared for generic letters frequently contain requirements for inspectors to review the SERs in order to identify areas needing verification, i.e., the licensee actions of most importance. For example, TI 2515-114, "Inspection Requirements for Generic Letter 89-04, 'Acceptable Inservice Testing Programs'," contains the following inspection guidance for plants with Generic Letter (GL) 89-04 safety evaluations (SEs):

The program should be assessed by ensuring compliance with commitments made in the approved IST [in-service testing] program. Relief requests for components in systems selected for inspection should be considered. Component tests should be as identified in the IST program and relief

requests. Program changes made after the SE should be in compliance with the Code or an applicable GL 89-04 position. For plants with SEs issued after GL 89-04, NRR has evaluated the program and written the SE considering the positions listed in GL 89-04. The inspector should verify that the items identified in the "Anomaly" section of the SE are resolved.

Similarly, as a result of a new regulation, a TI may be developed which may include requirements for verifying licensee commitments in associated safety evaluations. For example, TI 2515/120, "Inspection of Implementation of Station Blackout Rule, Multi-Plant Action Item A-22," prepared as a result of the station blackout (SBO) rule, 10 CFR 50.63, contained the following requirement for the selected plants:

As a minimum, the inspector should select plant areas, systems, etc. to be inspected based on the staff recommendations, licensee's commitments, and unconfirmed issues itemized in the staff's Safety Evaluation (SE) and/or Supplemental SE. In order to select the plant areas of importance, the inspector should carefully review the staff's SE and Supplemental SE for the plant that is to be inspected. In reviewing the SE and Supplemental SE, the inspector should, in addition to the explicit statements by the staff, consider any implicit acceptance, due to silence by the staff, of the licensee's positions.

The task group noted that TI 2515-120 was performed only at a selection of eight plants, which did not include Millstone, from all five NRC regions. The TI stated the staff would use the inspection results from the eight plants to decide if additional plants should be inspected.

In October 1987, a new inspection program concept that the agency was implementing was sent to regional and headquarters management. Included in the background for the new concept was the integration of licensing and inspection with the recent merging of NRR and IE. The background continued with "One result of this integration is the increased recognition of the need for inspection verification that the selective improvements expected by various licensing requirements have in fact occurred" (Ref. 33). The agency had developed processes for reviewing significant plant events, identifying generic and multiplant issues, and coordinating agency actions for resolving them. TIs are used for identifying those issues that the agency decides need verification, as discussed above and in Section 3.2. However, the agency did not develop a formal process for verifying improvements from plant-specific licensing requirements, although the 1989 PM's Handbook did instruct PMs to enter into SIMS those safety improvements that should be verified. The agency has used SIMS only for generic and multiplant issues and has not used the system for plant-specific licensing actions.

The inspector survey asked inspectors—if they had ever been directed to verify assumptions or licensee actions related to a license amendment or other licensing action—to note how this task was assigned, and to note how the results were documented. Of the approximately 140 respondents, 59 percent indicated they had verified such information or actions, and of those who received requests for inspection, 57 percent stated the requests were informally communicated. The results of such verifications were communicated informally (33 percent), by written reply (13 percent), or documented in inspection reports (54 percent). The results indicate that, although not

specifically required by the inspection program, some inspections are related to plant-specific licensing activities.

The task group concluded that requirements for verification of licensee commitments should be established for site-specific licensing actions or activities.

6.1.7 Qualification of Inspectors

The SIT for Millstone and Haddam Neck found several instances of previously inspected issues that arrived at incorrect or incomplete technical conclusions or failed to fully develop the scope of relevant issues. Given that the NRC inspection process is essentially an audit performed on a sample of licensee activities, not all issues will be identified by inspectors. Differing resolution of identified issues may also be unavoidable given the wide breadth of technical disciplines required of both licensee and inspection personnel. However, some of the erroneous conclusions identified by the SIT, specifically in design and engineering issues, were considered to be reasonably avoidable by technically qualified engineers. (The SIT also found examples of questionable reviews by NRR technical branches.) Examples of these issues are discussed in a July 1996 memorandum from the SIT to the Director, NRR. Examples include: a staff review in 1984 and an instrumentation and controls inspection in 1992 that did not identify the misclassification of a level instrument although the inspection reviewed the instrument's classification documents; the same inspection did not identify incorrect or missing setpoint calculations; a 1991 electrical distribution inspection did not identify discrepancies in battery profile calculations that affect the battery's operability; two inspections and several reviews by NRC headquarters did not recognize that a corrective action the licensee instituted in 1994 violated its technical specifications; and the staffs' review of several technical specifications changes did not recognize errors or inappropriate actions.

It may be reasonable to conclude from these observations that some inspectors lack the necessary technical knowledge and experience to effectively inspect some issues and topical areas. This is not surprising and represents the continuing challenge to management to ensure that inspector qualifications are known and inspectors are assigned to inspect areas within their capabilities. It may be a practical result, however, that compromises frequently take place to optimize the available inspection resources consistent with the current inspection workload.

Another variable in this area is the amount of experience and level of technical training gained by inspectors. IMC 1245, "Inspector Qualifications," states the minimum training requirements necessary for qualification as an inspector in each discipline. Although an unstated presumption of IMC 1245 is that prospective inspectors initially have some related technical training, formal education, or experience, there are no requirements, for example, for engineering inspectors to hold an engineering degree. However, the required qualifications for inspector positions include appropriate criteria for the applicable occupational series. For example, the stated qualifications for a regional reactor inspector in the Division of Reactor Safety are the following:

Knowledge of the principles, theories and practices in the general field of engineering, with specific knowledge of nuclear plant operations, maintenance, testing or plant/design engineering evidenced by possession of a degree in engineering or experience in the engineering field that has or

would be qualifying for certification as equivalent through professional registration procedures. Candidates must have experience associated with plant operations, maintenance, surveillance (including inservice inspection and/or inservice testing), or engineering.

Significant responsibility resides with management to scrutinize the specific qualifications of individual inspectors, particularly in highly specialized areas, since the training provided to become a minimally qualified inspector in accordance with IMC 1245 is broadly defined, i.e., the specific disciplines for qualification associated with power reactors are construction, operations (BWR and PWR), health physics, engineering support, emergency planning, and safeguards. Any specialized, supplemental training is customized to individual inspectors based on anticipated need. There is no specific guidance on minimum training requirements for narrow specialty areas.

The inspector survey contained questions intended to estimate the effectiveness of NRC training and to determine the relative value of other sources of technical knowledge required for inspectors. The survey asked the inspectors to identify and estimate the percent contribution of the different sources of information relied upon in order to perform the technical aspects of their jobs. The survey results indicate that on-the-job training accounted for approximately one-third of this information. Another third was comprised of knowledge and information gained from previous job experience and general engineering experience. The last third was comprised equally from formal education and formal NRC training.

This indicates that, for prospective inspectors, the technical knowledge already obtained from other jobs, together with that knowledge yet to be obtained by actually functioning as an inspector, greatly exceeds the contributions of formal education and formal training. Further, NRC formal training, comprising approximately one-sixth of the total information, represents a relatively small contribution. IMC 1245 states that "Classroom and simulator training are designed to supplement the inspector's education, experience, and NRC on-the-job training by providing basic theory and knowledge as well as job-related techniques." Thus, the apparently small contribution of NRC technical training may be as intended—weeks or months of training should not be expected to equate to years of experience and no other training can substitute for actual field experience. Accordingly, a sufficient amount of previous work experience and on-the-job training should be emphasized in the inspector qualification process.

However, IMC 1245 does not address in great detail the conduct or duration of on-the-job training. In the Inspector Qualification Journals included as appendices to IMC 1245, there is no section for on-the-job training and, therefore, no standards for what is considered to be a sufficient amount. The most closely related attribute is a requirement for the inspector trainee to accompany qualified inspectors on four inspections. Individual training attributes during this training phase are exclusively focused on the inspection process rather than on gaining technical knowledge.

The task group concluded that, based on the inspector survey, prior experience and on-the-job training are essential sources of technical information for inspectors. The formal qualification process for inspectors insufficiently addresses the scope and conduct of on-the-job training. New inspectors with little previous technical experience may be unequipped to function effectively until some significant level of on-the-job technical

training has been acquired. However, on-the-job training as an inspector should not necessarily be considered a surrogate for previous job experience.

The task group also concluded that further study and consideration is needed in the area of inspector qualifications and in management's determination of inspectors' capabilities, particularly in highly specialized areas and in design engineering.

TABLE 1

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

The task group assembled this chronology on the basis of documentation available in NRR files and in files maintained by individual NRR employees and on information provided by OGC. It is not presented as a complete chronology, but contains important events in the history of the AEC and NRC related to issues about inspection and reactor design bases as identified in the referenced documents.

<u>DATE</u>	<u>ACTION</u>
November 1959	The Compliance Division of AEC, responsible for inspecting licensed activities, was created and came under the AEC Assistant General Manager for Regulation and Safety along with the AEC Division of Licensing and Regulation and AEC Office of Health and Safety (Ref. 26)
1960	The AEC approved an amendment to the Vallecitos BWR which allowed the licensee (General Electric) to make changes to the facility, make changes in the procedures described in the application, and to conduct tests or experiments unless the change, test, or experiment involved an unreviewed safety question, as defined in the license. (Ref. 34)
1962	Section 50.59 added to the regulations. It has remained essentially unchanged from the 1962 version. (Ref. 35)
1965	The AEC was finding it difficult to develop reasonable design and component standards. This was a consequence of the evolving technology combined with little operating experience upon which to base those standards. As a result, new safety questions were raised on practically every application. The industry, meanwhile, lacking specific criteria to follow, submitted general and incomplete applications in attempts to avoid a detailed analysis of its designs. The regulatory staff was forced to make its decisions cautiously, conservatively, and subjectively on a reactor-by-reactor basis. (Ref. 26)
1967	Ergen Report issued on the possible results of a large-scale accident due to core meltdown. The report concluded that in the case of a core meltdown, containment was likely not to prevent emission of radioactive materials into the environment. The AEC responded by abandoning its reliance on containment as a primary safeguard. The regulators slowly shifted to a combination approach that included quality assurance, redundancy controls, and ECCS in addition to containment. In doing this the AEC moved from control of an accident to accident prevention. (Ref. 26)

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
1970	Between 1965 and 1970 the size of the regulatory staff increased by about 50 percent, and its licensing and inspection case load increased by about 600 percent. (Ref. 36)
June 1970	<p>AEC, Division of Compliance, Compliance Manual, Provisional Instruction (PI) 0700/4 is issued. The subject of this instruction was Regulatory Status of Final Safety Analysis Reports (FSAR). This instruction stated:</p> <p>"The FSAR and its amendments supposedly represent the final design of the reactor facility; therefore, there should not be any <u>significant</u> difference between the representations made in the FSAR and the as-built facility. While a facility may be modified without Commission approval using the 50.59 procedure, the 50.59 procedure <u>is not applicable</u> until an operating license has been issued.</p> <p>"It is recognized, however, that such modifications will be made by licensees prior to the issuance of an operating license. <u>When this occurs, the following procedures shall be followed by the Compliance inspection staff:</u></p> <ul style="list-style-type: none"> . . . <p>"3. For cases where an operating license will be issued before the modification is reflected in a revision to the FSAR, the licensee must be informed that after the facility is licensed we expect him to document the change promptly in a revision to the FSAR or justify and document the change internally using the 50.59 procedure; i.e., the FSAR, its revisions, and the documented 50.59 changes should represent the current as-built description of operating reactors. If such documentation is not available within a reasonable period of time after issuance of an operating license, 50.59 citations should be made."</p>
February 1971	Appendix A, General Design Criteria for Nuclear Power Plants, is added to 10 CFR Part 50. It is subsequently amended five times, most recently in October 1987.

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
1974	Energy Reorganization Act passed which ended the AEC and created from it the Energy Research and Development Administration (ERDA) and the NRC.
pre-1975	<p>Inspection program focused primarily on determining whether licensees were in compliance with NRC regulations and were heavily weighted to covering the applicant's or licensee's establishment and implementation of a quality assurance program. Implementation of the inspection program relied on inspectors who had previous experience in reactor construction and operations, and the inspection program was written to reflect that degree of inspector experience. Inspections were performed under the direction of the AEC Division of Compliance (1960), and five regional offices were established (1962). Criticisms of the program follow four consistent themes: (1) there are too few NRC inspections, (2) inspectors spend too little time actually at the plant, (3) even when on site, inspectors spend too much time reviewing paperwork as opposed to observing actual work or observing and conducting tests and measurements, and (4) there is not enough licensee performance evaluation with appropriate NRC response. (Ref. 37)</p> <p>A trial resident inspector program was conducted beginning in mid-1974 and ending in late 1976. (Ref. 38)</p>
June 1977	<p>The Commission approved modifications to the inspection program that included stationing resident inspectors on site. The Commission also approved:</p> <ul style="list-style-type: none"> ● a national performance appraisal capability that has three elements: (1) evaluation of the performance of NRC licensees from a national perspective, (2) an evaluation of the effectiveness of the NRC inspection program, and (3) confirmation of the objectivity of the NRC inspectors ● a significant extension of direct verification of licensee activities by NRC inspectors that involves more direct measurement and increased observation of activities and tests in progress ● an expanded training program to meet the needs of the revised inspection program. Training program to provide a balance between formal classroom instruction and on-the-job training for the new inspector. (Ref. 37)

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
1978	A GAO report found that NRC inspectors did little independent testing of construction work, relied heavily on the utility's self-evaluation, spent little time observing ongoing construction work, and did not communicate routinely with people who did the actual construction work. Similar problems exist in NRC inspections of operating plants. (Re. 24)
June 1978	Systematic Evaluation Program (SEP) implemented via IE Manual Change Notice 78-22 (TI 2515-12), June 12, 1978.
July 1978	Funding obtained for the resident program. (Ref. 39)
October 1978	TI 2515/15, "Spent Fuel Racks," is issued. This TI provided inspection guidance to verify that spent fuel storage capacity at operating reactors is being expanded in accordance with regulatory requirements. This TI focused primarily on procurement and QA activities for the racks following reported swelling of some storage tubes. The TI stated that "an increase in spent fuel storage capacity is an unreviewed safety question and approval of NRR is required (Module 37700B)." The reference to 37700B is probably a typographical error in that this inspection procedure addressed modifications <i>not</i> determined to be unreviewed safety questions, i.e., Section 50.59 modifications. IP 37701 was applicable to NRC approved modifications.
March 1979	This date marks the TMI accident. A proposed program to conduct Licensee Regulatory Performance Evaluations was interrupted by the TMI accident. (Ref. 40)
1979 (Post-TMI)	Initiated the Revised Inspection Program (RIP), and expedited the placement of residents at operating and construction sites. The RIP altered the region-based pattern of inspection to provide more on-site time and more direct verification of licensee activities and included: (1) resident program, (2) Performance Appraisal Team, (3) direct verification, (4) continual regional support, and (5) inspector training and career development. Fifty-seven residents were on site by November 1979. (Ref. 39)
	The Revised Inspection Program was evaluated by an external audit. Included was an evaluation of the Performance Appraisal Team (PAT) process:

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	<ul style="list-style-type: none">● Licensees appeared to have no consistent idea about the PAT's purpose and objectives. Licensees were given no consistent written statement of objectives. Communication was for the most part verbal, first from the regional office, then from one or more PAT members, and finally by word of mouth within the licensee's organization.● The regions did not appear to be firm supporters of PAT, nor did they have a consistent idea of its objectives.● Licensee employees saw, and attempted to use, the PAT as a 'lightning rod' for concerns they felt were not being adequately handled in their own organization. This appeared to be especially true where views at the plant differed from those at corporate headquarters.● Licensees evidenced an interest in how other utilities conducted their operations and hoped that the PAT would be able to provide that information. Licensee desire for information of this sort appeared widespread." (Ref. 41)
1980	<p>As a result of the investigative studies following the TMI accident, the Systematic Assessment of Licensee Performance (SALP) program was implemented. The major objectives of SALP are to improve licensee performance in the construction and operation of nuclear plants and to gain a basis for allocating NRC's inspection resources. (Ref. 40)</p> <p>Section 50.71(e) was added to the regulations requiring periodic updates to the FSAR. (Ref. 6)</p>
August 1981	<p>A major inspection program revision was made to implement changes as a result of lessons learned from TMI. The operations program (IMC 2515) was modified to include three program categories: (1) minimum inspection, (2) basic inspection, and (3) supplemental inspection. The basic program would be completed for a plant with a SALP rating of 2. Plants with a SALP rating of 1 would receive the minimum program, and plants with a SALP 3 would receive the supplemental program. (Ref. 39)</p>
April 1984	<p>NUREG-1055, the Ford Amendment Study, was sent to Congress (Ref. 22). It reported on a study exploring the causes of major quality-related problems in plant construction. Regarding the inspection program, the study concluded:</p>

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	<p>"NRC's past quality assurance efforts have focused on form and paper at the expense of implementation and evaluating quality of completed work, and they should be reoriented to emphasize performance and effectiveness. The inspection program should assess the issue of management capability and effectiveness on a routine basis, not just when the need for remedial action has become apparent."</p>
	<p>"Inspection programs appear to have been designed around available resources instead of determining what must be done and obtaining the resources to do it."</p>
	<p>"No project is without errors. These errors can be large or small, or there can be such an accumulation of small errors that the cumulative effect becomes large. The point at which an inspection finding leaves the realm of 'small' and becomes 'large' is referred to as the inspection 'threshold'. The inspection threshold has generally been higher for plants under construction than for operating plants; the rationale was that any major safety problems would be caught prior to operation through an intense preoperational testing program. This approach was based upon the observation that a plant does not represent any potential hazard to public health and safety until it goes into operation."</p>
	<p>"Historically, the NRC also did not perform inspections of any depth or frequency in the design area. Design was afforded less inspection attention than construction and construction less inspection attention than operating reactors. The lack of NRC inspection attention in the design area was due, in part, (1) to the need to prioritize the allocation of reactor inspection resources among operations, construction, and design, (2) to a shortage of inspectors technically qualified to review the design process, and (3) to a perception that design engineers did not need NRC inspection oversight as much as construction workers did."</p>
1985	<p>As a result of the Davis-Besse event, the senior management meeting concept was established. (Ref. 40)</p>
April 1985	<p>IMC 2530, "Integrated Design Inspection Program," is issued. Although this program was aimed at construction and NTOL (near-term operating license) sites only, its focus on the design process, design commitments, and conformance to the FSAR were equally applicable to operating plants. NUREG-1055 indicates that integrated</p>

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	design inspections (IDIs) actually started earlier, with three inspections completed through 1983 and the intent being that three IDIs would be performed each year. One objective of IDIs was to perform an evaluation "to identify consistent weaknesses in the design process such as 'lack of FSAR control', 'lack of verification of design calculations' or 'lack of documentation of engineering judgment made in the design process'." No specific information is available to recount the motivation for issuing this IMC, however, a similar program, IMC 2535, "Design Verification Programs," issued in early 1989, cited the Diablo Canyon mirror image design error event and stated that "some licensee quality assurance programs and NRC inspections had not been effective in discovering design errors because the audits looked only at the process and not at technical content."
August 1985	All TVA operating reactors (Browns Ferry 1, 2, 3 and Sequoyah 1, 2) are shut down. Among the regulatory problems is a loss of design control.
August 1987	One result of the Ford Amendment Study was issued; SECY-87-220, "Assurance of Quality," communicated the staff's shift in emphasis from "compliance based" inspections of licensees' quality verification organizations to "performance oriented" inspections of these organizations. This emphasis sought to assess whether licensee quality verification organizations were providing licensees with an effective and independent internal problem detection capability and appears to be one of the early program maneuvers toward emphasizing what is now known as licensee corrective action programs. Although this policy issue was directed primarily at licensee QA capabilities, it had applicability to NRC inspections in other areas. Although SECY-87-220 called this a "reorientation of NRC inspection efforts," in fact, performance-oriented inspections had evolved to be the routine practice for most inspectors for many years, especially for operating plants. Hence, the policy was catching up to the practice.
October 1987	A new inspection program concept was distributed to regional and headquarters management. Included was identification that, with the merging of IE and NRR, the inspection and licensing programs are being integrated. "One result of this integration is the increased recognition of the need for inspection verification that the selective improvements expected by various licensing requirements have in fact occurred." (Ref. 33)

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
November 1987	The first Diagnostic Evaluation Team (DET) inspection is completed for the Dresden plant. Fourteen similar inspections are performed through November 1994.
January 1988	Management of the reactor inspection program by NRR "is fragmented and lacking strong leadership" as noted during management team visits to the regions. Oversight of the program identified as being understaffed and inexperienced. (Ref. 42)
October 1988	<p>A new operating reactor inspection program was implemented to ensure the finite resources available for inspection are effectively used to enhance reactor safety. Key objectives of the program included:</p> <ul style="list-style-type: none">• more flexibility for the regional administrators to allocate a portion of the inspection resources based on licensee performance• increased emphasis on team inspections• explicit allocation of resources to respond to new regulatory and safety issues as they are identified• focusing a portion of the resources on one or more specific areas of emphasis <p>Key elements of the program included:</p> <ul style="list-style-type: none">• Fundamental Inspection Program, consisting of the Core Inspection Program and the Mandatory Team Inspection which is required to be completed for each operating unit or site• The Regional Initiative/Reactive Inspection Program, which is implemented by each regional administrator to follow up on safety issues identified as a result of inspections or operational events• Special Team Inspections, which are implemented as an NRR or regional initiative to provide for more in-depth technical examination of an area of concern• the Safety Issues Program, which provides for inspection followup, on a one-time basis, of past or newly identified generic

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	<p>safety issues (e.g., station blackout, emergency operating procedures)</p> <p>The Fundamental Inspection Program (FIP) is to be performed at all operating reactors. The additional programs are to be performed based on a need to follow up on events and safety issues, and to further investigate the root causes and corrective actions related to FIP findings. The FIP constitutes an adequate level of inspection at only the better performing plants (SALP 1 in many areas). All other plants require additional effort based on performance in various functional areas.</p> <p>Responsibility for the overall management of the program rests with the regional administrator subject to overview by the Director, NRR.</p> <p>Focus of the program continues to be adjusted as licensee activities change. For example, licensee and region SSFIs have increased, thus headquarters-led SSFIs have been reduced. Focus is also adjusted as confidence is gained with licensee corrective action programs. (Ref. 28)</p>
April 1989	Inspection Procedure 93803, "Safety Systems Outage Modifications (Team) Inspections" (SSOMIs), is issued. The FSAR, Section 50.59 evaluations, and SERs as they relate to design information are included in the inspection guidance. Many of these inspections were previously performed under an unknown procedure.
February 1990	NRR guidance to regions discouraging inspections of licensee self-initiated design-basis reconstitution programs (Ref. 30).
July 1990	Inspection Procedure 93801, "Safety System Functional (Team) Inspection" (SSFI), is issued. The SSFI determines whether the selected system is capable of performing the safety functions required by the design basis and by licensing requirements and commitments. Many SSFIs were previously performed under Appendix C or D to IMC 2515.
October 1990	Temporary Instruction (TI) 2515-107, "Electrical Distribution System Functional (Team) Inspection" (EDSFI), is issued. This inspection, intended to be performed at nearly every site, focused on elements of the electrical distribution system, which plant experience and probabilistic risk analysis (PRA) indicate are of higher risk to safety, and which generate information sufficient to reach specific

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	<p>conclusions which are indicative of the functionality of the electrical distribution and the engineering and technical support capabilities of the licensee.</p>
October 1990	<p>NUMARC 90-12, "Design Basis Guidelines," issued. SECY 90-365 informs Commission of staff actions on design-basis reconstitution and plans to issue letter with comments on NUMARC 90-12.</p>
November 1990	<p>Letter from NRR to NUMARC with comments to NUMARC 90-12 issued. "approach will provide useful framework and worthwhile insights to those utilities undertaking design-basis programs." The letter also noted the forthcoming issuance of NUREG-1397, "An Assessment of Design Control Practices and Design Reconstitution Programs in the Nuclear Power Industry," and other comments, such as suggested prioritization of reconstituting missing or incomplete documents.</p>
February 1991	<p>NUREG-1397, "An Assessment of Design Control Practices and Design Reconstitution Programs in the Nuclear Power Industry," is issued. Some conclusions: A consistent finding of NRC SSFI and SSOMI inspections is that utilities have not adequately maintained well-defined design bases, nor have they maintained adequate supporting design analyses or final design output documents. This has resulted in plant modifications that have been made without a firm understanding of the available design margins and how they have been affected by the modification.</p>
June 1991	<p>The UFSAR is heavily relied on as a design input source document. Although the UFSAR contains design-basis information, it is a licensing document and does not contain all the information needed by the engineer designing a modification. The information contained in the UFSAR also can be as much as 18 months behind the current plant configuration. The FSAR and other licensing documentation will not be a complete source of design input information, rather, they are an important repository of design-related information that is necessary for developing the design-basis documents. (Ref. 27)</p>
	<p>IMC 0102, "NRR Policy for Management Oversight of NRC Activities Conducted at Reactor Facilities," was revised to improve regional management's oversight of inspector actions and to increase management emphasis on activities intended to ensure performance and objectivity of inspectors. This action was implemented in part as</p>

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	a result of lessons learned from the 1989/1990 Regulatory Impact Survey.
September 1991	The Executive Direction for Operation (EDO) issued expectations of management and staff performance regarding staff professionalism (memorandum dated September 17, 1991). The Fundamentals of Inspection Course was updated and a new refresher course was developed for experienced inspectors.
December 1991	The staff requirements memorandum (SRM) to SECY-91-364 requested staff consideration of whether there is a need for rulemaking, guidance, or policy statement on licensees retaining accurate design-basis documentation and requested information on staff inspection plans.
February 1992	NUMARC briefed the Commission on industry design-basis reconstitution (DBR) efforts and results.
May 1992	SECY-92-193 responds to December 1991 SRM. Staff concluded that additional regulations are not needed. Recommends issuing policy statement and generic letter requesting licensees to describe their DBR programs and assigning priority to inspections based on the responses to the generic letter (GL). Continue encouraging identification of design issues through application of enforcement policy.
June 1992	SRM to SECY 92-193 approves policy statement and requests draft GL for Commission review.
August 1992	Policy statement issued: "Availability and Adequacy of Design Bases Information at Nuclear Power Plants." It states that licensees should be able to show sufficient documentation to conclude that current facility configuration is consistent with its design bases. The Commission further believes the design bases must be understood and documented to support operability determinations and Section 50.59 evaluations.
October 1992	SECY-92-365 forwards proposed GL on design-basis reconstitution. GL was published for comment.
November 1992	The Office of Policy Planning (OPP) conducted an assessment of the reactor inspection program that focused on the overall health and effectiveness of the program and its assessment and management

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	processes. Overall conclusion was that reactor inspection program is healthy; however, recommendations were made for improving team inspections and resident and specialist inspections. The EDO responded to OPP's assessment in memorandum to the Commission on April 13, 1993.
August 1993	NRR issued SECY-93-241, "Final Report on the Results of the Fiscal Year 93 Assessment of the Effectiveness and Implementation of the Operating Reactor Inspection Program." As a result, the regions revised or placed increased emphasis on planning processes to improve the correlation between plant performance and the allocation of inspection resources.
October 1993	SECY-93-292, negative consent paper, issued with staff recommendation not to issue GL on design-basis reconstitution based on industry comments (see October 1992). SRM with Commission negative consent issued in November.
December 1993	AEOD issued Quad Cities DET report with associated staff actions to improve staff identification and timely resolution of potentially significant licensee safety issues and performance problems.
July 1994	AEOD issued Palisades DET report with associated staff actions. A major staff action affecting the inspection program involved an evaluation of the need for inspection guidance to ensure that the quality oversight function was not diminished by a major change in licensee's organization and staffing.
1994	NRR established a task force to conduct an evaluation of the implementation of the NRC inspection program at South Texas Projects with associated recommendations. The task force concluded that the inspection program for operating nuclear reactors was adequate, but identified weaknesses in followup of licensee corrective actions, the mix of programmatic and performance-based inspections, and integration of inspection findings. Findings reinforced previous initiatives: implementation of a reactor inspection program newsletter, plant performance review (PPR) process improvements, implementation of the integrated performance assessment process, and the addition of regional and headquarters positions for senior reactor analysts.
March 1995	NRR conducted an analysis of the "Towers Perrin Nuclear Regulatory Review Study." Copies of the Towers Perrin Report in its entirety

TABLE 1 (CONTINUED)

CHRONOLOGY OF THE INSPECTION PROGRAM/DESIGN BASIS

<u>DATE</u>	<u>ACTION</u>
	were sent to all NRC employees who work with power reactor licensees to enable them to develop personal insight based on an introspective evaluation of the report. Improvements involved the issuance of a Commission policy statement, "Communication and Management Resolution of Inappropriate Regulatory Actions by NRC Staff," and a procedure for managing the resolution of concerns related to perceived inappropriate regulatory actions by the NRC staff.
May 1995	The Inspection Program Branch of NRR (PIPB) conducted an audit of NRC inspection reports and identified content and format issues affecting the effectiveness of inspection reports in documenting an accurate assessment of licensee performance. Subsequently revised IMC 0610.
June 1995	<p>NRR issued SECY 95-163, "Improvements to the Power Reactor Inspection Program and Implementation of the Integrated Performance Assessment Process." Incorporated insights from Quad Cities and Palisades diagnostic evaluations, Towers Perrin regulatory review study, and the Public Citizen report. Recommended making inspections more performance based, better integration of objective performance-related information, and improved use of risk insights.</p> <p>PIPB conducted an audit of NRC temporary instructions (TIs) and identified recommendations to strengthen the process for the development, issuance, conduct, documentation, MIPS reporting, and closeout of TIs.</p>
August 1995	GAO conducted audit "Nuclear Regulation: Weaknesses in NRC's Inspection Program at the South Texas Nuclear Power Plant," and made no recommendations.
December 1995	OIG conducted an audit of factors contributing to inconsistency in the operating reactor inspection program.

6.2 Review of NRC Licensing Process

6.2.1 Role of the Final Safety Analysis Report in Regulation

This assessment was performed to determine what has been and what should be the role of the FSAR in regulation. To address this, the task group reviewed the history of the FSAR, the regulations promulgated over the past 40 years pertaining to the FSAR, staff position papers, statements of consideration, and numerous internal staff notes and memorandum on the legal significance of the FSAR and its role in the licensing and inspection arena. The task group also reviewed the findings by the Special Inspection Team (SIT) for Millstone and Haddam Neck, the results of the survey of refueling practices at all operating reactors, the results of the review of UFSARs during normal inspection at 70 reactor sites during a three-month period in early 1996, and the results of discussions with licensing and inspection personnel. To determine how the FSAR was being maintained, used, and reviewed, a survey was conducted of PMs and resident and regional inspectors. The survey included questions on reviewing periodic revisions to the FSAR and evaluating licensee 10 CFR 50.59 programs.

Requirement for the FSAR

Section 50.34 of 10 CFR Part 50 requires that each application for a license to operate a nuclear reactor facility contain a final safety analysis report (FSAR). Section 50.34 specifies in general terms the information to be supplied in these safety analysis reports (SARs). More information appears in "Guide to the Organization and Contents of Safety Analysis Reports" issued by the Atomic Energy Commission⁵ on June 30, 1966. The successor to this 1966 guide is Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants, LWR Edition," first issued in February 1972. For an aid in following the history of the FSAR, see Table 2, "Chronology of the FSAR and FSAR Update Rule."

Regulatory Guide 1.70 states the principal purpose of the SAR is to inform the Commission of the nature of the plant, the plans for its use and the safety evaluations that have been performed to evaluate whether the plant can be constructed and operated without undue risk to health and safety of the public. It indicates the SAR is the principal document for the applicant to provide the information needed to understand the basis on which this conclusion has been reached; it is the principal document referenced in the construction permit or operating license that describes the basis on which the permit or license is issued; and it is the basic document used by NRC inspectors to determine whether the facility is being constructed and operated within the licensed conditions. Although the FSAR was an important document for inspecting construction of facilities, it has not been as important for inspecting operating facilities.

History of FSAR

The chronology for the evolution of the FSAR is shown in Table 2. In 1956, the Commission (AEC) issued regulations regarding the contents of applications to construct

⁵The Atomic Energy Commission (AEC) was abolished by the Energy Reorganization Act of 1974, which also created the Nuclear Regulatory Commission and gave it the licensing and related regulatory function of the AEC.

and operate a production or utilization facility. Section 50.34 required that an application should contain a hazards summary report. In addition, the regulations provided that either the Commission or the applicant would designate which provisions of the hazards summary report should be incorporated into the license as technical specifications. In June 1962, the Commission issued amendments to 10 CFR Part 50 which, among other changes, revised Section 50.36, "Designation of technical specifications," and added a new section, 10 CFR 50.59, "Authorization of changes, tests and experiments." The amendments to the regulations separated the technical specifications (TS) from the hazards summary report, reduced the amount of material to be included in the TS, specified that any changes to the TS still required Commission approval, removed the hazards summary report from the license, and permitted a holder of a license to make changes to the facility as described in the hazards summary report without approval of the Commission in accordance with the new Section 50.59.

In January 1966, the AEC proposed to substitute the term "safety analysis report" for the "hazards summary report" submitted by applicants for a license, and to designate the assessment prepared by the Commission's regulatory staff by the term "safety analysis" rather than "hazards analysis". In August 1966, the Commission proposed extensive revisions to Sections 50.34, 50.36, and 50.59. The final rule on these changes was issued in December 1968. These changes provide an important historical perspective on the intended role of the FSAR in regulation. A brief summary of the significant points follows:

- (1) A new paragraph (u) was added to Section 50.2, "Definitions," to define "Design bases." This is the same definition that is presently in Section 50.2, although the alphabetical indication was dropped.
- (2) Section 50.36 was revised to require submittal of proposed TS with the application. It specified that the TS must include items in the five categories described in the rule, specified that "the Technical Specifications will be derived from the analysis and evaluation included in the Safety Analysis Report, and amendments thereto, submitted pursuant to 50.34." The revised section required that "a summary statement of the basis or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the Technical Specifications." The revised section significantly reduced the scope and content of material to be included in TS "to focus attention on items more directly related to public safety."
- (3) A preliminary safety analysis report (PSAR) had to be submitted with an application for a construction permit.
- (4) An FSAR had to be submitted with an application for an operating license. The main purpose of the FSAR is to "provide (1) the necessary information from which technical specifications will be selected, and (2) the detailed bases for the specifications derived." The FSAR was to reference the many other documents that would describe the design bases, but these descriptions did not have to be incorporated in the FSAR.
- (5) Section 50.59 was revised to (1) clarify the requirement for records of changes made by a license, (2) redefine the term "unreviewed safety question," and

(3) permit, rather than mandate referral of proposed changes to the Advisory Committee on Reactor Safeguards (ACRS).

The discussion in this rulemaking reiterated that the "technical specifications are a part of the license, and cannot be changed without prior Commission approval." The FSAR was a supporting document, was not part of the license, and could be changed in accordance with Section 50.59.

The application for an operating license is submitted several years before the projected fuel load date, while construction, final engineering design and analyses, testing, procedure preparation, and other activities are still ongoing. During this period, the applicant submits numerous amendments to the FSAR so that when the plant is ready for an operating license, the applicant can certify that the "FSAR accurately describes the plant design and construction and that the FSAR reflected the status of the facilities safety-related structures, systems, and components." Until the FSAR update rule was promulgated in 1980, there was no requirement for incorporating into the FSAR changes to the plant design or amendments of the license once the operating license was granted.

Until the FSAR update rule was promulgated in May 1980, FSARs were not required to be maintained current and consistent with the as-built and as-modified plant. A survey of licensees in 1979 determined that there were only four licensees who were updating the FSAR that existed when the plant was licensed. Plant changes were controlled from a licensing perspective by Section 50.59, which also contained a requirement for licensees to maintain records of facility changes (i.e., changes to the plant or procedures as described in the FSAR) made in accordance with this provision. The December 17, 1968, revisions to Section 50.59 required that the licensee furnish to the Commission an annual report briefly describing changes made to the facility, and summarizing the safety evaluation of each change. These descriptions did not have to be incorporated into the FSAR. Thus, before 1980, the descriptions, design bases, and analyses in the FSAR could not have the status of stand-alone requirements because the plant probably would not have conformed to, and was not required to conform to, the FSAR.

In 1969, the facility was transferred from Projects to the Operating Reactors Branch when an operating license was issued to a plant. Each project leader in the branch was responsible for five to seven operating reactors. The operations of the technical review branches were focused on review of license applications. FSARs were not being maintained current to reflect changing plant designs and plant changes, and posed problems for the operating reactors project leaders, the personnel responsible for operator licensing, and the Compliance Division. On April 4, 1969, the Assistant Director for Reactor Operations asked the Director of Reactor Licensing to initiate a revision to 10 CFR Part 50 to require that applicants for a license file their SARs in loose-leaf form and that holders of operating licenses be required to file revised pages for these respective SARs within 30 days after their technical specifications were revised, or a change to the facility was made, in accordance with Section 50.59. There is no indication that the agency acted on this request.

On February 13, 1973, the Director of Licensing asked the Director of Regulatory Standards to initiate rulemaking to require periodic updating of SARs. Proposed revisions to the regulations were twice submitted to the Commission. There was disagreement

between the regulatory staff and the legal staff about the need for and the extent of the proposed revisions to the regulation, and the issue was put on hold.

After the NRC was created, the staff reinstated efforts to require periodic updating of the FSARs. On September 30, 1976, the NRC approved proposed rulemaking to require the FSAR to be maintained current. A notice of proposed rulemaking was published on November 8, 1976. During the next three years, various revisions to the proposed draft update rule were circulated for comment to the various NRC offices.

Following the TMI-2 accident, the idea of requiring periodic updating of the FSAR was reconsidered. In November 1979, the staff sought Commission approval to publish a final rule on updating FSARs. The revised rule reflected a few of the many comments received on the proposed rule published in 1976 in that it (1) changed the timing requirements to (a) permit the initial FSAR revision to be filed within 24 months, rather than 12 months, of the effective date of the rule or the date of issuance of the operating license and (b) permit all revisions to be up to date as of the previous 6 months rather than the previous 3 months; (2) required the initial revision to be a complete FSAR; (3) clarified the wording; (4) excluded applicants for operating licenses; (5) temporarily excluded licensees undergoing the systematic evaluation program; and (6) extended its applicability to all power reactors licensed to operate. The Commission approved the proposed rule for publication on April 16, 1980. The final rule, 10 CFR 50.71(e), was published in the *Federal Register* on May 9, 1980, and became effective on July 22, 1980.

The most recent revision to Section 50.71(e) was published on August 31, 1992. The revision extends the possible time between submittal of updates to the FSAR from 1 to 2 years. Specifically, updates to the FSAR can be submitted 6 months after each refueling outage, as long as the interval between successive updates to the FSAR does not exceed 24 months.

The rule requires that the updates include the "effects of: all changes made in the facility or procedures as described in the FSAR, all safety evaluations performed by the licensee either in support of" license amendments and determinations that unreviewed safety questions do not exist, and "all analysis of new safety issues performed by or on behalf of the licensee at Commission request." The statement of considerations indicated that all analyses submitted to the NRC since the original application for an operating license were to be incorporated into the updated FSAR, either in the associated sections or in an appendix to the FSAR (Ref. 6).

Over the years, there have been a number of NRC staff memoranda, letters, or other correspondence stating the NRC staff's position on what licensees should include in the updated FSAR (UFSAR). Some of these documents had a significant effect on the contents of UFSARs. The first was Generic Letter (GL) 80-110, which was issued along with the original issuance of Section 50.71(e) (Ref. 43). The generic letter stated, in response to questions, that the changes to the FSAR were to "include all material submitted to the NRC" and the intent of the rule was "to locate previously submitted information in one document." On March 27, 1984, the Director of Licensing in NRR stated in a memorandum that "new analyses, required as a result of NRC requirements or submitted by a licensee, should be incorporated if they relate to the FSAR. If the analyses performed were of a nature that would not normally be included in an FSAR then they need not be included in the update." The memorandum stated that, in general, information that

must be reflected in the UFSAR was "any analysis or system modification which is reflected in a Technical Specification," because the FSAR "provides a basis for Technical Specifications."

The staff noted in 1986 that there was no regulation that expressly required a licensee to operate its facility in accordance with the facility descriptions and procedures in its FSAR, although it has been the agency's expectation that they would operate in this manner. One of the most significant staff position papers regarding the contents of FSARs was the December 1992 memorandum to Commissioner Curtiss from the EDO on "Current Licensing Basis" (Ref. 7). In addition to the discussion of commitments, design bases, and facility changes that may or may not be captured in a licensee's periodic updates of its FSAR, the memorandum stated that:

The FSAR update requirements contained in 10 CFR 50.71(e) have not been interpreted by either the licensees or the staff to require new commitments and design bases developed in response to rules, generic letters, bulletins and enforcement actions, and those proposed in licensee event reports be included in the FSAR. As a result, the staff found more than half of the audited facilities were updating the FSAR to only reflect the effects of changes to the facility and its programs. In general, the scope of the FSARs was not being expanded to address issues not originally included at the time of OL issuance. The Statements of Consideration for 10 CFR Part 54 recognized that the complete CLB for a facility is not included in the FSAR.

On the basis of correspondence regarding UFSARs, inspection reports, audits of UFSARs, and the experience of PMs who were with the agency for some time, it was recognized that the periodic updates of the FSARs by some licensees (1) only addressed changes to the facility for processes, structures, systems, and components that were discussed in the FSAR that existed when the plant's operating license was issued; (2) supported a change to the technical specifications, or (3) changed an accident analysis in Chapter 15 of the FSAR.

Millstone Unit 1 FSAR

On October 18, 1993, Northeast Utilities submitted LER 93-011-00, "Spent Fuel Cooling System Capability," informing the Commission that it had "determined through engineering analysis that conditions may have existed where the Spent Fuel Pool Cooling System may have been incapable of maintaining pool temperature below the 150° F design limit" and that "these results are not consistent with the Millstone 1 Updated Final Safety Analysis Report (UFSAR) and the Safety Evaluation Report for License Amendment 40, which provided for expanded Spent Fuel Pool storage capability in 1988." The licensee stated that "the Millstone 1 UFSAR along with design basis documents will be revised to reflect actual refueling practices and the results of analyses associated with these practices" before the next refueling outage, which was scheduled for January 15, 1994.

Revision 1 to this LER, which was submitted on December 27, 1995, supplemented the original submittal. The NRC staff's activities related to this issue are discussed elsewhere in this task group report, in OI and OIG reports, in inspection reports, and in reports to the Commission. On August 21, 1995, an individual submitted a petition under 10 CFR 2.206 alleging that refueling activities may not have been consistent with the Millstone 1 UFSAR,

which is what the licensee reported two years previously and which had been assessed in several inspection reports. The 2.206 petition elevated the issue to management attention and it was the main focus of the NRC's December 13, 1995, 10 CFR 50.54(f) letter to Northeast Utilities on Millstone Unit 1.

Northeast Utilities had formed an event response team to determine the causes for inaccuracies in the Millstone Unit 1 UFSAR. The team also performed a limited assessment of the accuracy of the UFSAR for Millstone Units 2 and 3 and Haddam Neck. On February 22, 1996, the team issued its findings as Adverse Condition Report (ACR) 7007, "Event Response Team Report." One of the basic problems was that the initial UFSAR submitted in December 1986 contained errors and omissions along with weaknesses in the licensee's configuration management practices that prevented accurate updates to the FSAR.

In addition to the hundreds of discrepancies in the UFSARs for Millstone Units 1, 2, and 3 and for Haddam Neck which were identified by the licensee, the NRC's Special Inspection Team (SIT) found additional examples of plant operations, procedures, and design modifications that were not as described in the UFSARs.

Survey of Project Managers on Maintaining UFSAR

By memorandum dated May 31, 1996, the task group conducted a survey of NRR PMs with respect to their review of licensees' revisions to the UFSAR and their evaluation of licensees' 10 CFR 50.59 programs (Appendix B to this report). The first question on the survey form asked PMs if the FSARs for their plants were up to date (i.e., have all the revisions to the UFSAR submitted by the licensee in accordance with 10 CFR 50.71 (e) been incorporated into the PM's copy). Even with the recent attention on FSARs, about a third of the PMs had not been maintaining their UFSAR up to date or only recently had inserted past revisions. In a few cases, the UFSAR was so out of date, the PM asked the licensee for a complete replacement set of volumes.

There are only three sets of the UFSARs for each plant maintained at headquarters—one in the docket file, one in the Incident Response Center, and one maintained by the PM. The task group found that the Incident Response Center and the docket file room incorporate updates into their copies of the UFSARs as the updates are received. In response to another survey question, the PMs reported that the technical staff or the PM often or routinely reviewed the pertinent sections of the UFSAR when evaluating proposed license amendments or proposed licensing actions.

The elements and standards in the non-SES performance plan for PMs is not very specific with respect to maintaining the PM's copy of the UFSAR up to date. One of the standards for Element No. 1 states that the PM demonstrates "familiarity" with license documents and correspondence, including among other items, both the FSAR and updates to the UFSAR. The elements and standards do not specify that the PM maintain the UFSAR up to date with the periodic revisions submitted by their licensee in accordance with 10 CFR 50.71(e), nor do they specify that the PM should review the revisions. Section 3.4.13 of the PM's Handbook does not mention the need to maintain the PM's copy of the UFSAR up to date but does discuss review of revisions to the UFSAR as follows (Ref. 5):

There is, therefore, no formal NRR program to review the UFSARs. The ORPM [operating reactor project manager] should, on receipt of an

amendment to the UFSAR, review the changed pages to confirm that indeed all changes are appropriately covered by licensing actions, 10 CFR 50.59 reports, or regional inspection activities. If new and unaddressed information is discovered, the ORPM should initiate appropriate licensing action, and should notify management.

The expectation in the PM's Handbook did not recognize the vast scope such a review may require. Periodic updates for newer plants with large UFSARs can cover hundreds of pages and would necessitate a detailed knowledge of the modifications and changes made to the facility, which are minimally summarized in periodic reports (also large documents), as required by Section 50.59.

One of the questions in the survey of PMs asked about familiarity with the UFSAR and the PM's review of licensee revisions. There were a number of comments and suggestions in this area. When a person is the PM for a plant that has applied for an operating license, there are many amendments to the FSAR as the design is finalized and the preoperational programs completed. The PM has to be very knowledgeable about everything in the FSAR, because the PM has to prepare (with technical assistance) the Commission's safety evaluation report and support the staff's positions before the Atomic Safety and Licensing Board Panel, the ACRS, and the Commission. Only about one-third of the present PMs have experience with construction permits or issuing an operating license for a plant, and none of them are currently assigned a plant they licensed. When assigned to a new plant, a PM will gradually become familiar with sections of the UFSAR in connection with such activities as events at the plant, LERs, license amendments, site visits, and system walk downs with the resident inspectors. A number of PMs suggested that management should reevaluate the practice of periodically rotating PM assignments, because a PM who has been with a plant for several years is more likely to be familiar with the FSAR, changes made in accordance with Section 50.59, licensee commitments, and proposed corrective action programs.

6.2.2 Role of Commitments in Regulation

The task group reviewed correspondence and processes regarding what constitutes a licensee commitment, where commitments are documented, how the agency tracks commitments, and how the agency verifies plant-specific commitments made by licensees.

What Is a Commitment?

The most comprehensive assessment of commitments is the discussion in Volume Two of the report of the Regulatory Review Group (RRG), which was issued in August 1993 (Ref. 44). Although the term "commitment" has been used freely in the regulations and in other correspondence, the RRG found that the word "commitment" was not defined in the regulations. The RRG recommended that the following definition be adopted:

Commitment — any condition or action agreed to or volunteered by a license holder that has been submitted to the Commission as a basis for a safety decision, and both the condition or action and the decision that made use of the information are contained in the docket file.

This was the definition adopted by NEI in its "Guideline for Managing NRC Commitments, Revision 2," dated December 19, 1995, and which the NRC approved as an acceptable guide for licensees to follow for managing and changing their commitments to the NRC (Ref. 45).

The NRR staff has been given guidance regarding licensee "commitments." On July 31, 1981, the Director, NRR, issued "NRR Office Letter No. 34 - Utility Commitments." Revision 1 to this office letter was issued on May 20, 1985, but is no longer among NRR's active office letters. The office letter noted that licensees may make oral or written commitments identifying future actions in response to staff comments, such as during processing of a license amendment request. The staff might even reflect this commitment in the SER supporting the requested licensing action. The office letter pointed out that commitments of these types in an NRC letter are not binding on the utility; therefore, the reliance on such commitments should be minimized. It also indicated that a commitment should be incorporated in the technical specifications or added as a license condition if the commitment is of such safety significance that it needs to be upgraded from an intent to carry out an action and is critical to the staff's approval of a licensee's proposed request. Generally, if commitments are judged by the technical review organization to be a necessary element to support an acceptable finding, these commitments should be clearly spelled out in the SER and reflected in the licensee's next periodic update of the UFSAR. However, the NRC has no process for identifying or designating new information that should be incorporated into FSARs through its normal licensing process. Even though commitments reflected in an UFSAR may be changed by the licensee without prior NRC approval, in accordance with 10 CFR 50.59, the basis for the change is a matter of record and is reported to the NRC in the periodic 50.59 report. As the RRG noted, "by having the licensee evaluate the change to the commitment in this manner, there should be no effect on the safety of the plant." It has long been the agency's position that commitments made in an FSAR have more regulatory significance than those made in licensee event reports, responses to notices of violations, responses to generic letters, and other correspondence.

Tracking Licensee Commitments

The May 8, 1996, OIG report noted that the staff does not track licensee commitments credited by the NRC as a condition of approval of the licensee's request. The report also noted that the staff did not have and does not presently have a formal system to track licensee commitments and that the NRC places too much reliance on licensees for information.

The regulatory process relies on commitments in many instances to resolve safety-significant issues and the NRC expects licensees to honor in good faith those commitments that have a safety or regulatory purpose. Many regulatory commitments are not found in the FSAR, but exist in other docketed correspondence, such as licensee event reports (LERs), responses to notices of violation (NOVs), and responses to generic letters. Those commitments not in the FSAR are not controlled by a defined regulatory process such as 10 CFR 50.59. Therefore, licensees have the ability to change docketed commitments not contained in the FSAR without informing the Commission. The agency endorsed an NEI guideline for managing commitments made to the NRC and is still evaluating its use (Ref. 45).

The PM Handbook also discussed management expectations for issuing SERs and following up on important aspects of licensing actions. The handbook indicated that the safety improvements (e.g., installation of hardware, revision of plant procedures, and training of personnel) of actions were to be tracked for implementation with the agency's Safety Issues Management System (SIMS). The handbook also expected the regional office to verify the improvements and report the status of verification within SIMS. However, the SIMS has been used only for generic and multiplant issues and has not been used for recording and verifying such improvements on plant-specific licensing actions and activities.

6.2.3 Maintaining the Licensing Basis

The purpose of this section is to discuss the meaning of the commonly referred to terms "design basis," "licensing basis," and "current licensing basis" for operating plants; where the licensing basis is found; how it is maintained; and how it should be maintained.

Design Basis

"Design basis" is defined in 10 CFR 50.2⁶. This definition was added to the regulations on August 16, 1966, as part of a major revision of Sections 50.34, 50.36, and 50.59. Section 50.34(b), "Final safety analysis report," requires FSARs, which are submitted with the application for an operating license, to state the design basis for the associated facility. When the FSAR update rule for operating reactors (Section 50.71(e)) was issued in 1980, it required that the affects of "all analyses of new safety issues" conducted at Commission request be incorporated into the UFSAR. The agency did not interpret the update rule to require including into UFSARs new design bases as a result of new requirements or in response to generic communications (Ref. 7). A 1991 staff analysis of licensee practices for design control and efforts to reconstitute design-basis documents found that the underlying analyses and calculations were as important as the design-bases values defined by Section 50.2 "to have a fully documented and auditable design" (Ref. 27). The NRC staff concluded in 1992 that new design bases, developed after initial licensing, are not included in UFSARs and that current regulations do not ensure that the UFSAR references all the design basis for a plant (Ref. 8). The staff also concluded in 1992 that, although the design bases may be part of the current licensing bases (through the FSAR and subsequent analyses sent to the agency), licensees must be able to retrieve the documents that contain the current licensing bases and recognize the licensing basis information to use the information effectively.

Current Licensing Basis

Neither "licensing basis" nor "current licensing basis" are defined in 10 CFR Part 50. The only time the phrase "current licensing basis" is used in Part 50 is in 10 CFR 50.54(f), within an exception for justifying Commission requests for information. The term "current licensing basis (CLB)" is defined in 10 CFR 54.3. Part 54 states the requirements for

⁶*Design bases* are defined in Section 50.2 as "that information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design." The definition states the values may be derived from "state of the art" practices or analyses based on calculations or experiments.

renewal of operating licenses. That neither licensing basis nor current licensing basis is defined has been discussed in a number of staff reports and assessments.

The subject of current licensing basis (CLB) received considerable attention during the Commission's deliberations on the license renewal rule (10 CFR Part 54). In December 1991, the staff issued NUREG-1412, "Foundation for the Adequacy of the Licensing Basis." In a November 29, 1991, staff requirements memorandum (SRM), the Commission asked the staff to determine if licensees were compiling the CLB along the lines of the staff's proposed definition in Section 54.3. To obtain this information, the staff issued Generic Letter 92-03, "Compilation of the Current Licensing Basis: Request for Voluntary Participation in a Pilot Program," on March 19, 1992. The staff also conducted audits at 14 plants of all reactor vendor types and from all regions. The staff then held a workshop on June 23 and 24, 1992, that was attended by over 200 people representing almost all utilities, NUMARC and numerous vendors. No licensee volunteered to compile its plant's current licensing basis, at least not along the lines of the definition being proposed by the staff for 10 CFR Part 54. The results of the staff's assessment were reported in SECY-92-314, in which the staff recommended that the Commission *not* require compilation of the CLB and *not* revise the interpretation of 10 CFR 50.71 to include the entire CLB (Ref. 8).

For defining "current licensing basis" in 10 CFR Part 54, the staff had proposed a definition that encompassed almost all correspondence on the docket for a plant, including commitments that would not be reflected in the UFSAR and that the licensee could change outside the 10 CFR 50.59 process without Commission notification or approval. In a memorandum of September 29, 1992, Commissioner Curtiss questioned again why such a broad definition was necessary if the audits and workshop reported in SECY-92-314 showed the existing requirements were adequately maintaining the "design basis" for operating plants.

To partially respond to this request, the NRC Office of Policy Planning (OPP) prepared a report (Ref. 46). In its report, OPP suggested that consideration be given to establishing a Part 50 definition of CLB for operating reactors with a much more limited scope than what is now in Section 54.3, and that the latter be revised to include only what might be promulgated for currently operating reactors. An initial response to Commissioner Curtiss was provided by the EDO on December 4, 1992 (Ref. 7). The staff noted that "no specific safety concerns were identified either during the limited audits performed by the staff or during the CLB workshop." However, in view of the OPP report, the issue was being reevaluated. The staff's reevaluation was documented in SECY-94-066 (Ref. 47). The reevaluation included week-long team inspection of seven licensee programs for maintaining the licensing basis. A main conclusion was that the staff did not identify a need to further clarify the term "design basis" as it is used in the regulatory process.

In summary, the staff's previous evaluations show that many of the evaluated licensees are maintaining the design basis for their plants, and the lack of a definition for current licensing basis in Part 50 has not been the relevant to maintaining the design basis. However, the agency needs to reevaluate the statements and bases from SECY-92-314 in light of the design-basis issues raised by the staff inspections and licensee reviews at Millstone, the inaccuracies in UFSARs uncovered by NRC inspections and licensee reviews, and the problems encountered by the staff in retrieving the licensing basis.

TABLE 2

CHRONOLOGY OF THE FSAR AND FSAR UPDATE RULE

<u>DATE</u>	<u>ACTION</u>
January 19, 1956	AEC revised 10 CFR 50.34 regarding the contents of applications to include a hazards summary report (21 FR 355). The regulations provided that either the Commission or the applicant will designate which provisions of the hazards summary report should be incorporated into the license as technical specifications.
June 9, 1962	AEC promulgated 10 CFR 50.59, separated hazards summary report from license, allowing licensees to change it in accordance with the new Section 50.59. Technical specifications remained part of license and required Commission approval for any changes thereto (27 FR 5491).
January 21, 1966	Revised 10 CFR 50.34. The term "hazards summary report" was changed to "safety analysis report" (31 FR 832)
June 30, 1966	AEC issued a "Guide for the Organization and Contents of Safety Analysis Reports."
December 17, 1968	Significantly reduced contents of technical specifications. Required submittal of a preliminary safety analysis report (PSAR) with an application for a construction permit and expanded the material to be included in the FSAR submitted with the application for an operating license. Section 50.59 was revised to (1) clarify the requirement for records of changes made by a licensee and (2) redefine the term un-reviewed safety question. (33 FR 18610)
April 4, 1969	Memorandum from Donald J. Skovholt, Assistant Director of Reactor Operations to Peter A. Morris, Director of Reactor Licensing, recommending that 10 CFR Part 50 be revised to require that FSARs be maintained current.
February 1972	AEC issued for information and comment a proposed "Standard Format and Content of Safety Analysis Reports for Nuclear Plants" that superseded the 1966 guide. This document set up a standard format for these reports and identified the information needed by the staff for its review of applications. It was revised and issued in October 1972 (Revision 1), in September 1975 (Revision 2), and again in November 1978 (Revision 3). It was designated Regulatory Guide 1.70 when Revision 2 was issued. Each revision incorporated changes to account for new developments in the industry and new Commission needs for information on which

Table 2 (Continued)

CHRONOLOGY OF THE FSAR AND FSAR UPDATE RULE

<u>DATE</u>	<u>ACTION</u>
	to base its finding with regard to the issuance of a permit or license. Conformance with the standard format is not a requirement.
February 13, 1973	Memorandum, Jack F. O'Leary, Director of Licensing (AEC), to Lester Rogers, Director of Regulatory Standards, to initiate rulemaking to require updating of FSARs.
July 13, 1973	Proposed staff paper to revise 10 CFR 50.71, "Periodic Updating of Safety Analysis Reports," circulated within Office of Regulation (AEC) for comment.
April 1, 1974	Proposed Consent Calendar Item from L. Manning Muntzing, Director of the Office of Regulation, to AEC Commission for consideration of proposed revisions to 10 CFR 50.71.
April 13, 1974	Comments from AEC Commissioners (particularly Commissioner Doub) that draft rule should be substantially revised "so as to require only what is really needed and reduce, as much as possible, the burden on licensees."
June 11, 1974	Significantly revised proposed rule and justification transmitted to L. Manning Muntzing from Director of Licensing and Standards.
January 27, 1976	Memorandum from Robert B. Minogue, Director, Office of Standards Development (NRC) to E.G. Case, Chairman, Regulatory Requirements Review Committee, transmitting policy paper for consideration of proposed amendment to 10 CFR Part 50 to require periodic updating of FSARs.
April 27, 1976	Memorandum, Robert B. Minogue, Office of Standards Development, to E.G. Case, Chairman, Regulatory Requirements Review Committee (RRRC) transmitting revised policy paper to require periodic updating of FSARS, modified to reflect RRRC's comments of March 15, 1976, and comments from the Office of Policy Evaluation.
September 30, 1976	During Policy Session 76-41, the NRC Commission approved for publication in the <i>Federal Register</i> a notice of proposed rule-making (contained in SECY-76-425) to require the FSAR to

Table 2 (Continued)

CHRONOLOGY OF THE FSAR AND FSAR UPDATE RULE

<u>DATE</u>	<u>ACTION</u>
	be maintained current, on an annual basis, for nuclear power plant licenses issued after January 1, 1963.
November 8, 1976	Notice of proposed rulemaking inviting public comment published in <i>Federal Register</i> (41 FR 49123) regarding adding new paragraph (e) to 10 CFR 50.71 to require annual updating of FSAR.
December 27, 1976	Notice of correction and extension of comment period published in the <i>Federal Register</i> (41 FR 56204) regarding periodic updating of FSARs.
1977, 1978, 1979	Various drafts of revised FSAR update rule circulated for office concurrence.
November 15, 1979	Following the accident at TMI-2, the staff requests Commission approval (in SECY-79-618) to publish proposed rule to require periodic updating of FSAR. Proposed rule revised from the one published in 1976.
April 16, 1980	SRM on Affirmation Session 80-15 (Thursday, April 10, 1980) approving publication of proposed amendments contained in SECY-79-618 subject to the deletion of one item and three requested actions.
May 9, 1980	Modified rule on periodic updating of the FSAR published in the <i>Federal Register</i> (45 FR 30614). The rule became effective on July 22, 1980, and required annual updating of the FSAR except for licensees of Systematic Evaluation Program (SEP) plants.
Week of June 9, 1980	Meetings with licensees to respond to questions on FSAR update rule. Since rule applied only to operating reactors, staff proposed changing name to Operating Safety Analysis Report. (This was not approved.)
December 15, 1980	Generic letter to all operating reactor licensees from Darrell G. Eisenhut publishing some of the questions and guidance discussed with licensees the previous June. (Subsequently designated as Generic Letter 80-110.)

Table 2 (Continued)

CHRONOLOGY OF THE FSAR AND FSAR UPDATE RULE

<u>DATE</u>	<u>ACTION</u>
July 31, 1981	Memorandum from Harold R. Denton, Director, NRR to All NRR Employees, "NRR Office Letter No. 34 - Utility Commitments," is issued. States position that if a licensee commitment is of such importance in that no change should be made without prior staff review and approval, it should be reflected in the technical specifications or as condition to the license, since commitments reflected in an FSAR may be changed by a licensee without prior NRC approval in accordance with 10 CFR 50.59.
June 15, 1982	Memorandum, Thomas M. Novak to Herbert N. Berkow on legal status of updated FSAR (UFSAR). In consultation with the Office of the Executive Legal Director, stated that the docket files must maintain the original FSAR (the FSAR at the time the operating license was issued). "The updated FSAR is not being reviewed and certified by NRC to be correct. Therefore, the original FSAR plus amendments remains the licensing basis for the plant."
March 27, 1984	Memorandum, Darrell G. Eisenhut to Richard W. Starostecki on content of UFSARs. Regulatory Guide 1.70 is not intended to be used as a standard for determining the appropriate level of detail for FSAR updates. Information not previously addressed in the original FSAR is not required to be addressed in the update. However, new analyses required as a result of NRC regulations should be incorporated if they relate to the FSAR. The update should include "all analysis of new safety issues performed by or on behalf of the licensees at Commission request".
May 20, 1985	NRR Office Letter No. 34, "Utility Commitments," is revised to include oral commitments and to state that commitments essential to the staff's finding of acceptability need to be formally documented by the licensee and clearly described in the SER. In January 1989, the NRR's system of office letters is revised and Office Letter 34 is marked to be reissued as Office Letter 900, but it does not become part of the new office letters.
June 1986	A staff position is developed that the FSAR is not part of the license, although the FSAR serves as part of the licensing basis for the plant, since the technical specifications, which are part

Table 2 (Continued)

CHRONOLOGY OF THE FSAR AND FSAR UPDATE RULE

DATE

ACTION

of the license, are derived from the analyses and evaluations in the FSAR. There is no regulation that expressly requires a licensee to operate its facility in accordance with the facility descriptions and procedures in the FSAR. The agency's regulatory scheme recognizes that it is neither necessary nor manageable for the Commission to undertake prior review and approval of all subsequent changes to the design and operation of the facility as described in the FSAR beyond those involving technical specifications. As a practical matter, enforcement of FSAR commitments through the Section 50.59 process may be more difficult than enforcement of technical specifications or regulatory requirements.

May 27, 1988

Final rule on retention periods for records published in the *Federal Register* (53 FR 19240). Modified Section 50.71(c) to require that updated FSAR records shall be retained until the license is terminated.

June 18, 1992

Notice of proposed rule inviting public comment published in the *Federal Register* (57 FR 27187) regarding reducing the regulatory burden on licensees. Among other proposed changes in reporting requirements was a proposed revision to 10 CFR 50.71 to permit FSAR updates to be submitted once each refueling outage rather than annually.

August 31, 1992

Notice of final rule on reducing the regulatory burden on licensees published in the *Federal Register* (57 FR 39353) with an effective date of October 1, 1992. Revised frequency for submittal of FSAR updates (10 CFR 50.71) and design change reports (10 CFR 50.59). Updates to the FSAR can be submitted 6 months after each refueling outage, provided the interval between successive updates to the FSAR does not exceed 24 months.

December 4, 1992

Memorandum from James M. Taylor, Executive Director for Operations, to Commissioner Curtiss, "Current Licensing Basis," discusses results of 14 audits and a workshop assessing the amount of information added to UFSARs as a result of certain technical issues for which actions were requested by the NRC after the FSAR update rule was issued in 1980. States that the FSAR update requirements contained in 10 CFR 50.71(e) have not been interpreted to require that

Table 2 (Continued)

CHRONOLOGY OF THE FSAR AND FSAR UPDATE RULE

DATE

ACTION

newly developed design bases as a result of generic letters, bulletins, and other sources be included in the FSAR. Although 10 CFR 50.59 allows, among other things, certain changes to the facility as described in the FSAR without prior NRC approval, it does not provide a process that explicitly covers the design bases which are on the docket but not in the FSAR.

6.3 Review of NRC Enforcement Process

6.3.1 History of Guidance Related to FSAR Enforcement

The NRC's enforcement program is guided by NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions" (enforcement policy), published in July 1995. Enforcement was previously codified in 10 CFR Part 2, Appendix C, with procedural requirements for enforcement actions referenced in 10 CFR Part 2, Subpart B. The enforcement policy was first published in October 1980 as an interim policy and on March 9, 1982, the Commission published a final version of the policy.

The procedural requirements are now in the NRC Enforcement Manual (NUREG/BR-0195), which promulgates detailed guidance and procedures to implement the enforcement policy. The original Enforcement Manual contained no specific guidance related to FSAR enforcement until a revision in 1990. The guidance was contained in Chapter 6, "Guidance on Supplements," Section 6.1.2, "Enforceability of FSAR Commitments," (Ref. 48) and was consistent with a 1986 staff position on the bases for enforcement of FSAR commitments. The task group noted that, as early as 1970, Atomic Energy Commission internal procedures discussed enforcing Section 50.59 for modifications not made, to bring facilities into conformance with their FSARs (Ref. 49).

The agency took the position in 1986 that establishing a violation of an FSAR commitment through the Section 50.59 process in some cases may be a more involved process than establishing a violation of a technical specification (TS). The position expressed that the difficulty with identifying violations of Section 50.59 in a consistent manner was the lack of definitive guidance to NRC inspectors and to licensees on what constituted an acceptable evaluation of proposed changes. The need for standard definitions and guidance on what were acceptable evaluations of proposed changes under Section 50.59 had been identified as one of the elements of the staff's TS improvement program (Ref. 50).

The agency's position also indicated that the staff considered clarifying the regulations to improve their enforceability to state that: (1) commitments in the FSAR must be implemented by the time an operating license is issued unless otherwise excepted; (2) the licensee must operate its facility in conformance with the descriptions of its facility and procedures in its FSAR unless the FSAR is changed in accordance with 10 CFR 50.59, and (3) to state that any change to the FSAR as well as a change to the facility or procedures as described in the FSAR, requires a Section 50.59 review and a Section 50.71 update.

Consistent with the agency position, the NRC's Office of Enforcement (OE) prepared an enforcement guidance memorandum (EGM) in 1987 that discussed violations of Section 50.59 and the difficulties encountered with the proper application of the requirements because violations involving the failure to comply with the requirements were more difficult to develop (Ref. 51). However, it appeared that the EGM was never issued to the regions, possibly due to concerns expressed from a regional administrator over certain uses of Section 50.59 as the basis to cite licensees. Nevertheless, it appeared to the task group that the draft EGM may have been responsible for initiating the 1990 revision to Section 6.1.2. of the Enforcement Manual.

In March 1990, an NRC memorandum discussed comments received from the staff on the re-draft of the revision which stated that citations for failures to meet FSAR commitments be developed citing (in order of preference) (1) the underlying requirement or TS, (2) 10 CFR Part 50, Appendix B, Criterion III, "Design control," or (3) Section 50.59. It also stated that citations against Section 50.59 may be more appropriate due to the continuing nature of the violation (Ref. 52). The failure to meet an FSAR commitment historically has resulted only in the issuance of a notice of deviation (NOD) or, if applicable, a violation of one of the procedural requirements described above, because the FSAR was not a legally binding requirement. It should be noted that the term "deviation" is defined in Section 50.2 only as it applies to construction. NRR provided concurrence on the draft in April 1990 (Ref. 53).

In May 1990, the revised guidance became effective and stated that enforcement action may be taken directly against the underlying requirement, e.g., TS, general design criteria, Section 50.59, or some other regulation. If the departure from the FSAR did not directly involve a specific requirement, the failure to implement the FSAR commitment involving safety-related matters may constitute a violation of the quality assurance requirements of 10 CFR Part 50, Appendix B, Criterion III, "Design control," as the basis for the violation. An NOD can be used in cases where the commitment described in the FSAR is very general or if the departure from the FSAR did not concern safety-related equipment necessary to support the basis for the facility accident analysis, or activities governed under the facility quality assurance program. The enforcement policy provided that NOV's need not be issued for certain Severity Level IV and isolated Severity Level V violations and that noncited violations of the FSAR should be documented in the inspection report consistent with the guidance for documenting such violations.

Conclusion:

Although the subject of FSAR enforceability was discussed in various NRC documents as far back as 1970, no specific guidance existed until Section 6.1.2, "Enforceability of FSAR Commitments," was incorporated into the 1990 revision to the Enforcement Manual.

6.3.2 Review of FSAR Commitments and Interim Enforcement Guidance

In January 1996, NRR issued guidance to the regions to emphasize and supplement the existing level of updated final safety analysis report (UFSAR) reviews that are done as part of all reactor inspections performed by the regions (Ref. 54). Specific guidance covered the review of the applicable portions of the UFSAR as it relates to the specific activity being inspected, verification that the applicable portions of the UFSAR are consistent with plant practices and procedures, and documentation of any inconsistencies or deviations between the UFSAR and the plant. This effort was later extended indefinitely pending a permanent change to the inspection program.

The staff analyzed about 3 months of inspection data from the UFSAR emphasis and the results and analysis are documented in a memorandum from the EDO to the Commission which will be issued presently. The staff identified 219 FSAR discrepancies of varying significance in 130 inspection reports from 70 reactor sites. About one-third of the inspections during the 3-month period did not identify any FSAR discrepancies. The inspection findings resulted in 8 potential escalated enforcement issues (approximately 4 percent), 7 of which related to design problems and had poor implementation of Section

50.59 as a significant root cause, and 27 discrepancies (approximately 12 percent) resulted in Severity Level IV violations. The percentage of violations generally agrees with the task group's review of enforcement actions related to FSAR discrepancies. The task group found that FSARs are referenced in approximately 15 percent or less of issued violations.

The staff screened the 219 FSAR deficiencies through a probabilistic risk analysis (PRA) to evaluate their potential for risk significance and identified 7 individual discrepancies as being potentially risk significant. The regions had identified all seven items as either escalated enforcement, Severity Level four violations, or an unresolved item. The staff concluded that the items were appropriately handled by the inspection and enforcement programs. The staff also found that the significance of approximately 85 percent of the FSAR discrepancies was minor, although they did contain items that should have been issued as violations. The staff is taking no further action on those items because the risk-significant items have been appropriately handled, and the consistency of future enforcement will be enhanced with the issuing of a proposed revision to the Enforcement Policy (SECY-96-154). The task group believes that the 219 FSAR discrepancies contain a full range of violations, including minor ones although the staff's review did not classify them as such. The proposed Enforcement Policy also addresses minor violations derived from FSAR discrepancies.

To give additional guidance in the areas of Sections 50.59 and 50.71(e), OE issued a May 1996 draft EGM to the regions, which discussed departures from the FSAR in violation of Section 50.59 and for failure to update the FSAR, as required by Section 50.71(e) (Ref. 55). The EGM discussed consideration for categorizing severity levels based on several examples when weighing compliance with Sections 50.59 and 50.71(e), and requested that the regions consult with OE before concluding that a departure from the FSAR was not a violation of an NRC requirement. Departures from the FSAR have been previously discussed in agency correspondence. For example, a July 1981 NRR office letter discussed licensee commitments and stated that any change in the licensee's facility, or its procedures described in the FSAR, such as not following or deleting a commitment reflected in the FSAR made without following the procedures of Section 50.59 and related administrative TS, was inconsistent with the license and Section 50.59 (Ref. 56).

The regulatory process is predicated on the assumption that when the license is issued, the facility, procedures, tests, and experiments will be described in the FSAR. This concern over the legal basis of the FSAR prompted OE to review all operating power reactor licenses to establish the regulatory basis between the terms of the license and the FSAR. In June 1996, OE reviewed the first two pages of all 107 power reactor licenses and noted that, with the exception of four licenses (Quad Cities 1 and 2, Turkey Point 3, and Vermont Yankee), each license contained a reference to either the FSAR or the UFSAR. In general, the licenses stated that the "license applies to 'X' plant, located on the licensee's site in ..., as described in the licensee's FSAR [UFSAR] as supplemented and amended...." The licenses for Quad Cities 1 and 2, Turkey Point 3, and Vermont Yankee, instead of referencing the FSAR or the UFSAR, contained a statement that "the facility is located on the applicant's site...and is described in the application for construction permit and facility license, as amended." The application for a facility license includes an FSAR. These general references may form the basis for industry's perception of a change in NRC's position on FSARs. In a July 1996 unsolicited report to the Commission, which transmitted its analysis of the regulatory significance of FSARs and implementation of

Section 50.59, the Nuclear Energy Institute (NEI) indicated that "NRC staff have stated that, in their view, all commitments and statements in the FSAR should be treated as 'stand alone' requirements" and any deviation from the FSAR "would be a violation of NRC requirements" (Ref. 9). The staff is evaluating NEI's analysis of Section 50.59 implementation and will address it as part of the staff's Section 50.59 action plan.

On July 5, 1996, the staff forwarded to the Commission for its consideration a paper to allow OE to revise the current enforcement policy in response to increased regulatory attention to Part 50 licensees' adherence to the FSAR and the identification of numerous failures of licensees to conform to this document (Ref. 57). The guidance reiterated the requirements of Section 50.59 and its impact on changes to the facility as described in the FSAR. The paper stated that a failure of the facility to conform to the FSAR (including cases in which the FSAR contains inaccurate or incomplete information) may be a violation of Section 50.59, and failure to meet a specific commitment described in the FSAR may be a violation of a particular regulatory requirement, if the departure from the FSAR involved a change to the facility, procedures, tests or experiments described in the FSAR. Additional guidance also addressed severity levels associated with departures from the FSAR, reporting requirements, and incentives for licensees to ensure conformance with the FSAR in accordance with Sections 50.59 and 50.71(e).

In developing this guidance, the staff considered the importance of performing appropriate evaluations to ensure that there are not unreviewed safety questions or conflicts with TS, and the importance of maintaining and controlling changes to the licensing basis as described in the FSAR so that both the licensee and the NRC understand the regulatory envelope that has been reviewed, approved, and established for the facility.

Conclusions:

The legal and regulatory status of FSARs and UFSARs needs to be clarified and the effects on enforcement evaluated. Once determined, the staff should consider amending operating plant licenses consistent with the policy.

A large number of lesser significant violations were identified in the FSAR review and although these violations may have no direct safety significance, they may have regulatory significance (e.g., inaccuracies with the FSAR). The draft EGM addresses these issues and provides additional guidance to address severity levels associated with departures from the FSAR, in accordance with Sections 50.59 and 50.71(e), when they reach the level of regulatory significance.

6.3.3 Enforcement of Deviations From the FSAR and the Licensing Basis (Sections 50.71(e) and 50.59)

The task group reviewed enforcement data from several sources such as OE's Enforcement Action Tracking System (EATS), Standard Review Plan Update and Development Program's Text Retrieval System (SRP-UDP TRS), 766 System, and the Inspection Followup System (IFS), which primarily identified citations against Appendix B of 10 CFR Part 50, TS, and Section 50.59. The task group only attempted to identify the frequency with which design-based FSAR deficiencies were identified without further review and analysis into what initiating event may have caused the staff to look into the FSAR area.

EATS Database

Developed by NRC's Office of Information Resources, EATS was originally developed to track escalated enforcement actions from the time the region or program office notified OE until disposition. For Millstone, a review of the History Reports section of the program, which covered the period 1987 through the present, identified a total of 19 violations, of which 8 cases of design-based escalated enforcement actions were identified. It was noted that during the SALP period from April 1993 to July 1994, the NRC took escalated enforcement action against Northeast Utilities (NU) for Millstone on six occasions. The enforcement actions resulted in civil penalties totalling \$320,000 which originated from discrimination issues between NU and several employees, one of whom raised safety concerns to NU about the operability of the Unit 1 feedwater coolant injection system for which the NRC later cited NU for failure to take prompt corrective action. Recurring elements at the root of these actions included the failure to promptly and effectively resolve issues identified by NU employees.

A review of EATS for design-based escalated enforcement actions (violations involving keyword search of either TS, FSAR, Sections 50.59 and 50.72/50.73) for all plants other than Millstone identified 190 violations, since 1988, which represented 15 percent of the total. The review further noted that although references to the FSAR were mentioned in the text of the violation, the TS were responsible for the largest category of violations cited.

SRP-UDP TRS

The SRP-UDP TRS database was queried to identify the total numbers of violations associated with FSARs to determine the historical frequency and the regulatory requirements which were cited in an attempt to determine inspection activity in the area of FSAR enforcement. During the period from 1988 through the end of 1995, the search identified a total of 8830 hits which then had to be narrowed down to just those related to the FSAR. The search identified 1705 potential hits against the FSAR in 219 files (approximately 19 percent of the total violations). Due to time constraints, the task group identified six outlier plants that matched the design-based LER effort performed as part of the Licensee Reporting portion of the task group's review. To qualify as a outlier plant, the plant had to have submitted more than five design-based LERs for a calendar quarter.

The six outlier plants, and their respective total violations from 1988 through 1995, were Millstone (152), Sequoyah (252), Fort Calhoun (182), FitzPatrick (123), Cooper (151), and Palisades (150). After performing the FSAR keyword search and reading each resulting violation for each of the outlier plants, the actual number of violations associated with FSAR deficiencies were as follows: Millstone (14), Sequoyah (10), Fort Calhoun (2), FitzPatrick (6), Cooper (1), and Palisades (12). Thus FSAR discrepancies attributed to about 4.5 percent of the total violations for the six plants. However, the task group identified instances where the database did not contain all violations known to have been issued for several plants and, therefore, had to use the information carefully.

The task group's review of the available data indicated that the staff enforced discrepancies between plants and their FSARs. With the exception of Cooper, escalated enforcement actions were taken for all six plants reviewed, which included the imposition of civil penalties from \$25,000 to \$100,000. A small percentage of the violations mention

a discrepancy with the FSAR and cite violations against requirements such as TS, Section 50.59, or Appendix B of 10 CFR Part 50. Very few cite violations against Section 50.71(e) although the spent fuel pool licensing basis review found about five plants that did not update their UFSARs following license amendments for reracks.

The task group also reviewed the results of another review of the database performed by NRR in June 1996. In this earlier review, all inspection reports that mentioned enforcement related to the FSAR or Section 50.59 were selected to determine the nature and extent to which the NRC had in the past enforced discrepancies with the FSAR. Between 1988 and the present, the review identified 61 NOV's, of which 74 percent cited in the body of the NOV either a specific section of the FSAR or made a general reference to the FSAR. Upon further review of the text of the NOV's, 75 percent of them mentioned either a failure on the part of the licensee to perform a Section 50.59 safety evaluation, or when an evaluation was performed, the licensee was cited for failure to perform an adequate evaluation. Although the remaining 25 percent of the NOV's did not cite a specific section or reference to the FSAR, in almost all cases the text related to a Section 50.59 issue. However, as the task group noted above, the enforcement data in the SRP-UDP TRS is not complete.

766 System

The 766 System was queried to identify the range of enforcement actions taken with respect to FSAR discrepancies. Although no longer used, the 766 System (replaced by the IFS discussed below), contains data from inspection reports from January 1975 through September 1991 and received approximately 1000 inspection reports annually, of which 30 percent involved some type of enforcement action. However, many discrepancies exist with the data contained in the system. Estimates obtained from NRR revealed that as much as 35 percent of the existing data may be unusable (15 percent of the data is missing, 18 percent of the severity levels is incorrectly coded, and 20 percent of the text is incorrect). However, despite the problems associated with the data, a keyword search was performed which included variations of the terms FSAR, 50.59, LER, and technical specification. The search produced over 11,000 pages of records for power reactor licensees. Due to the large volume of data produced by the keyword search, only the six outlier plants were reviewed, similar to the SRP-UDP TRS review. The results indicated that for the six plants, approximately 90 violations and 12 deviations were cited almost equally between TS, Section 50.59, and Appendix B of 10 CFR Part 50 requirements, with the majority (34 percent) cited against TS. In order to obtain the data, each page of the record for each plant had to be read carefully because the database report included multiple duplicate entries.

IFS

Because the 766 System contains data only up through September 1991, the IFS was searched for FSAR discrepancies for the period October 1991 through February 1996. IFS, unlike the 766 System, does not contain the text of the violations and deviations. The database is intended to contain all inspection reports and all separately listed NOV's and NOD's by their issuance date. As with the SRP-UDP TRS and the 766 System, a similar review was performed for all plants, for the period October 1991 through June 1996, using the design-based keyword search parameters discussed in previous database searches.

The review of all plants identified a total of 691 violations (including deviations) in the following areas: FSAR (138), Section 50.59 (87), LER (267), and TS (199). The LER category represented the largest group with 39 percent of the total violations, followed by TS (28 percent), FSAR (20 percent) and Section 50.59 (13 percent). However, as noted with other database searches discussed previously in this section of the report, duplication exists within each keyword search parameter. For example, the keywords FSAR and final safety analysis report accounted for 138 total violations; however, these keywords may have been referenced several times within the same violation. To identify the actual numbers of violations referencing only the FSAR, a detailed review was performed for each of the six outlier plants. Separate computer searches were performed for each plant, but the abstract of the text of the violation was not of sufficient detail to determine, with reasonable accuracy, the actual violations. Although not performed during this portion of the task group's review, a detailed review of the text of each NOV, NOD, and enforcement action would be necessary to accurately identify violations referencing the FSAR, or any other design-based requirement (Section 50.59, LER, or TS), and the regulatory requirement cited as the basis for the violation.

As previously discussed in the discussion of the 766 System, the IFS also had problems with the data such as wrong titles, terminology discrepancies, miscoded severity levels, incorrect identification of violations and deviations, and incomplete data. Information obtained from the Planning, Program, and Management Support Branch (PMSB) of NRR showed that not all inspection reports and NOVs have been entered as a record into IFS. The rate of missing inspection report data declined during the period searched from 19 percent in FY 1992 to 11 percent in FY 1995, with no similar statistics performed for FY 1996. Other problems included "text" and "comment" fields that are limited in character size to adequately describe the noncompliance and the identification of completely wrong text in 2 percent of the issuances in FY 1992 and FY 1993, and 4 percent in FY 1994. For FY 1995 issuances, 26 percent had problems that sometimes included the wrong text and most often included text that was so brief that a comparison to the actual document was not possible.

The task group's review of all available data demonstrated that although NOVs were written against FSAR discrepancies, deviations were seldom written. The view of experienced inspectors on the task group suggested that one possible explanation for this was the reluctance on the part of agency management to support enforcement of these discrepancies. This philosophy appears to be confirmed in a January 1996 Commission meeting in which a regional administrator acknowledged that the reason agency inspectors did not use the FSAR during inspections is because agency management did not enforce it (Ref. 58). He further acknowledged that the FSAR is the baseline reference to the plant, required by NRC regulations, and to solve the problem agency management must force consistency in its use.

Conclusions:

The task group concluded from its review of the data presently available in NRC databases that the NRC generally enforced deficiencies against the FSAR. However, the task group could not determine what prompted the staff to look specifically into the area of the FSAR during its inspections (e.g., LER initiated, allegation, routine inspection, or previous followup to an NOV or NOD).

A review of the data suggests that when FSAR deficiencies were identified, the majority of the NOV's were usually cited against the most easily defensible regulatory requirement, usually technical specifications, Section 50.59, or Appendix B of 10 CFR Part 50 quality assurance requirements. Very few violations cited Section 50.71(e) although the spent fuel pool licensing-basis review found about five plants that did not update their UFSARs following license amendments for reracks. The review noted that NODs were seldom written against FSAR discrepancies.

6.3.4 Enforcement of Minor Violations and Deviations With Low Safety Significance

The task group reviewed available documents to determine if the issue of minor violations needed to be addressed. The group reviewed data from the recent emphasis FSAR inspections, NRC regional reviews, the task group's review previously discussed in Section 6.3.3, above, the results of the Special Inspection Team for Millstone and Haddam Neck, existing NRC guidance and policy as it relates to minor violations, and an NU self-assessment document (ACR-7007). The task group found that minor violations (violations of low safety significance) did not significantly contribute to the problems identified with FSAR discrepancies relative to Sections 50.59 and 50.71(e) at Millstone. In addition, the NRC's review of FSAR inspections, discussed in Section 6.3.2, above, found approximately 85 percent of the FSAR discrepancies reported were of minor significance. However, the task group could not determine whether any of these deficiencies met the test of a minor violation, although it believes the 219 items includes such violations.

Minor violations of Sections 50.59 and 50.71(e) are discussed in Section 6.3.1.1 of the Enforcement Manual, and Section IV of the Enforcement Policy, and are also discussed in the revised enforcement guidance submitted to the Commission for approval in July 1996. Typically identified as severity Level IV, minor violations are not subject to formal enforcement action under the Enforcement Policy, and are violations for which the NRC staff chooses to exercise discretion and refrain from issuing a 10 CFR 2.201 NOV, because the violation would not have a material impact on safety or licensed activities. It must be noted that since the inspection program's focus is primarily on safety, a test of whether a violation should be categorized as a minor violation is whether, if it recurred several times, it would remain a minor concern and would not have a material impact on safety or licensed activities.

Conclusion:

Other than policy decisions, the task group could not draw any conclusions with respect to the issue of minor violations. However, use of the revised enforcement policy, following its approval by the Commission, should help NRC inspectors develop consistent application and implementation in identifying and documenting minor violations and categorizing failures to meet the requirements of Sections 50.59 and 50.71(e).

6.4 Review of Licensee Reporting

6.4.1 Analysis of Licensee Event Reports

As a part of the broad-based review of regulatory reporting requirements in relation to the staff's review activities at Millstone, the task group conducted a review of design-related licensee event reports (LERs) submitted over a 10-year period for those plants belonging to

the three Millstone peer groups (General Electric, Combustion-Engineering, and Westinghouse). The Millstone 1 peer group contains 23 plants, and the three peer groups together comprise 56 plants total (roughly equal to one-half the number of operating plants in the country) (Ref. 59). The review was also performed in order to identify any potential licensee peer group outliers or emerging patterns or trends. To support this review, an LER screening search was performed on the Oak Ridge National Laboratory Sequence Coding and Search System (SCSS) LER database and was sorted for design-related errors reported by licensees from 1985 through the first quarter of 1996. Included in this compilation may be LERs that were reported after some staff review or inspection activities. The data were sorted by docket numbers and grouped according to each of the three Millstone peer groups in order to allow further analysis and to identify any outliers that may be dominant contributors. Figures 1, 2, and 3 show the overall results for each of the three Millstone peer groups.

The task group also compared the design-related LERs with the LERs from all categories for the Millstone peer groups over the 10-year period. The overall LER reporting rate has been in a declining trend since 1985 (see Figure 4, Total LERs). This decline has been correlated with the elimination of unnecessary reporting requirements in 1992, improvements in operating performance which translates into fewer operating events, and design enhancements which can have the same effect as improved operating performance. Figure 5 shows the design-related LERs for all peer groups from 1985–1996. It also shows that, between 1987 and the end of 1995, the reporting rate appears to have been relatively stable (no trend detected). However, the decline in the overall LER reporting rate resulted in a relative increase in the percentage of design related LERs compared to the LER total. Approximately 8 percent of the LERs from the late 1980's were design-related. By 1994, the number of design-related LERs submitted constituted 20 percent of the overall LERs. Figure 6 shows the ratio between design-related LERs and the total number of LERs. Comparing the distribution of all design-based LERs to the distributions for each peer group showed that the GE peer group dominated the distributions.

The task group performed additional analysis on the Millstone 1 GE peer group because of its significance as the dominant contributor to the number of design-related LERs. The group attempted to identify the basis which prompted the Millstone 1 peer group licensees to the discovery of the reportable design-related conditions. Results from this additional review effort identified several causes or motivating factors that appear to have prompted the discovery of these reportable conditions. These causes fell into two distinct categories: NRC-initiated activities and licensee-initiated design-basis reconstitution programs.

The reasons most often cited in LERs within the NRC-initiated activity category which led licensees to the discovery of design-related deficiencies, were licensee activities and corrective actions associated with special NRC team evaluations and inspections and in response to the issuance of NRC generic correspondence. Examples from this category included diagnostic evaluations, special design-oriented NRC team inspections such as electrical distribution safety functional inspections (EDSFIs) and safety system outage modification inspections (SSOMIs), and licensee reviews in response to Generic Letters (GLs) 89-10 and 89-13 (motor-operated valve programs and service water inspections). Operating experience reviews using the Institute of Nuclear Power Operations (INPO) Network database was also a contributor.

The second category contributing to design-related LERs was ongoing licensee reviews of plant systems performed as a result of design-basis documentation (DBD) or reconstitution programs or in connection with Individual Plant Examinations (IPEs). Some licensees may have implemented DBD program efforts in order to proceed with or complete IPE efforts.

Conclusions:

The staff's efforts in eliminating unnecessary reporting in conjunction with improvements in operating performance by licensees has reduced the LER reporting rate. However, these actions essentially had no effect on the reporting rate of design-related LERs. There also may have been a negating effect between two activities which would have affected this reporting rate, namely, the voluntary effort by the industry to reconstitute design basis and the staff's reduced regulatory effort in design-basis activities. Taking these factors into account, the task group believes that no substantial long-term improvement in reducing the number of design-related LERs has occurred over the past 10 years. In addition, the task group believes that when the staff focuses inspection efforts in this area, both the licensees and the staff identify problems. Thus, increased efforts in design-basis inspection may increase the reporting rate of design-related LERs.

6.4.2 Staff Review of and Guidance for Licensee Event Reports

Within NRC headquarters, two offices are responsible for reviewing Section 50.73 LERs. The Safety Programs Division in AEOD has primary responsibility for the review and analysis of all operating reactor LERs, particularly for broad generic safety issues. LERs are reviewed against screening criteria for safety significance, generic implications, abnormal occurrences, and trending of operational data. This responsibility is governed under AEOD Procedure 3, "Screening of U.S. Operational Experience," which was issued in December 1990 and was revised in July 1995. The results and findings from the AEOD staff reviews are collected, tracked, and archived within a database known as the Work Assignment Management System (WAMS) database.

The Office of Nuclear Reactor Regulation (NRR) reviews LERs as part of the responsibilities assigned to project managers (PMs) and as assigned to the Events Assessment and Generic Communications Branch. Draft Management Directive (MD) 8.13, "Evaluating the Safety Performance of Nuclear Power Reactor Licensees," broadly discusses these processes. The MD references the guidelines and responsibilities for incorporating LER and other reportable event reviews and states how this information will be integrated with other staff data collection programs designed to help senior managers understand safety performance at nuclear power reactor sites. Supporting this MD are LER reviews performed by NRR PMs. The PM's Handbook contains some guidance on how reportable events should be followed by the project management staff in NRR. For example, the PMs should evaluate and investigate significant occurrences (reviewed from LERs) to determine what NRR action is indicated and to keep abreast of what action the region is taking. A PM who believes an unreviewed safety question is involved should initiate a licensing action (Ref. 5). The Events Assessment Branch, NRR also reviews LERs in connection with significant operating reactor events and takes action, as appropriate, to address any identified generic issues or immediate safety concerns.

Although some overlap in LER reviews exist between the two offices, the reviews focus on different aspects (immediate safety issues vs. longer term studies with generic

implications). With the differences noted in the approach to LER reviews, the task group finds that oversight and coverage regarding LER analysis appear adequate.

Although it appears that adequate LER screening and review programs and guidance have been promulgated, some weaknesses in these processes were noted concerning the PM's LER review responsibility and with the use of the AEOD WAMS database. First, PMs do not seem to be responsible for performing a general review or screening of the LERs submitted on their assigned plants. The PM's Handbook does not go into any detail regarding general screening of LERs by PMs, and only focuses on reviews resulting from significant operating events or events that involve unreviewed safety questions (USQs). Second, the AEOD WAMS database is limited in its capability and usefulness in its current form. The database does not have the capability to adequately track the history of reviewers assigned to a particular LER, it lacks appropriate status information (there is no way to indicate a proposed future study or topic to be considered for study), and it is too cryptic to be of much benefit to many individuals. The database can not produce a printout with the same detail displayed on the viewer's screen. For example, Millstone 1 LER 245-93-011-00 regarding the lack of capability to maintain the spent fuel pool below 150°F was reviewed, categorized, and closed by AEOD and entered into the WAMS database. This LER was dispositioned as a Category 2 LER, which indicates it contained some safety significance, and was designated for inclusion in an "ongoing AEOD study." It was also noted that the LER quality was poor. However, no AEOD study of this topic was being conducted at that time. In discussions with AEOD staff, the task group learned that this LER was informally suggested as a topic of future study, even though this was not documented in the WAMS database. Since the database has no field to indicate a proposed topic to be studied, the database had no means of documenting what the reviewer suggested. On the basis of these observations, the AEOD staff should consider the need to upgrade this database to be of more practical use.

Additional staff guidance regarding LER reporting has been through the development and issuance for comment of the second draft of NUREG-1022, Revision 1, "Event Reporting Guidelines," published by AEOD in February 1994. In Section 3.2.4(3), "The Nuclear Plant Being in a Condition That Is Outside the Design Basis of the Plant," the staff has clarified its proposed guidance on reporting those conditions that are outside the design basis of the plant. Examples given in the draft report include an emergency core cooling system (ECCS) design that does not meet the single-failure criterion, and one of two trains of safety-related equipment that has been incapable of performing its design function for an extended period of time. Examples given in the draft report where reporting under this section of the rule would not be necessary include items such as minor infractions of technical inoperability based on overdue surveillances, or where the LCO allowed outage time was slightly exceeded. On the basis of a review of the second draft of NUREG-1022, Revision 1, it is recommended that priority be given to put this report in final form. It is further recommended that Section 3.2.4 of NUREG-1022, Revision 1 be revised to include more examples of design-related reportable occurrences and clarification and differences between operating outside the design basis, USQs, or operating in an unanalyzed condition.

6.4.3 Adequacy of Design-Related LER Reporting Thresholds

The task group's review of the SCSS LER and AEOD data, including NUREG-1022, showed that there was a wide range of reporting thresholds by licensees under Sections 50.72 and

50.73. The thresholds ranged from voluntary reporting based on information only, to a failure to report identified through NRC inspection activities. The LER review conducted for this study showed that each licensee had its own threshold for reporting. In most cases, LERs reviewed by the task group appeared to fall within the staff's guidance for reporting under Section 50.73. However, the task group could come to no conclusion about the adequacy of the reporting threshold because it has been known that reportable conditions have existed in the industry for which no LER was submitted, and the group's lack of knowledge regarding how pervasive this may be would prevent further analysis. It was not possible without further significant review effort to assess whether or not the LER reporting threshold level was adequate under all scenarios.

6.4.4 Importance of the Design Basis in Licensee Reporting

The term "design basis," as defined in Section 50.2, includes that information pertaining to, or that describes the functions or functional goals for, those structures, systems, or components within a facility. The threshold and scope for reporting deficiencies in the design basis has varied widely within the industry, principally due to the confusion that has existed about what constitutes the design basis for a facility. In order for the staff to perform its function as a regulator and to ensure that appropriate action can be taken on those issues that warrant staff action, the regulations require that deficiencies in the design basis be reported. The staff's understanding of the design basis for any particular facility relies to a large extent on how well that licensee reports to the staff such actions as changes to the facility as described in the FSAR, correcting errors uncovered during design-basis documentation reviews, or implementing modifications made in response to operational events. Periodic updating of information within the scope of the FSAR, which includes the design basis, is required by the FSAR update rule (50.71(e)). This rule was intended to maintain design-related and other information important to the facility current and readily available. Further, the reporting requirements contained in Sections 50.9, 50.59, 50.72, and 50.73 require licensees to notify the Commission upon recognizing that previously submitted information was incorrect, to obtain NRC approval before implementing a change or conducting a test that involves an unreviewed safety question, or to report conditions where the licensee has determined it has operated the facility outside of its design basis.

In the past, there has been confusion regarding terminology as to what is meant by the "design basis" of a plant or facility (Ref. 27). Special team inspections performed by the staff after the Salem ATWS event in 1985 indicated that licensees did not have a good understanding of their design basis, current licensing basis (CLB), or design margins as defined in the Bases of the technical specifications. Concerns by the staff prompted many licensees to undertake programs to reconstitute their design bases in order to recapture missing design information. Because corrective or remedial actions resulting from such reconstitution programs can involve considerable expenditures and resources, some licensees have interpreted narrowly the design-basis definition in Section 50.2. These licensees interpret the definition of design basis in Section 50.2 as only that information which defines or identifies the specific function to be performed by a structure, system, or component to be part of the design basis, and not the supporting engineering or design analyses. This interpretation could mean that supporting engineering documents may not be included in the design-basis reconstitution effort. The staff discussed in SECY 92-314 that some licensees were still confused about the relationship between the design basis as defined in Section 50.2 and the CLB as defined in Section 54.3. This issue was again

addressed in SECY-94-066. In NUREG-1397, the staff outlined the relationship between design basis, design margins, plant changes, operability, and reportability with respect to these regulations. NUREG-1022 (second draft), and sections of Inspection Manual Chapter (IMC) 9900 (provided to the industry by GL 91-18) further support this relationship (Ref. 60).

Over the past few years, several initiatives have been undertaken or completed by the staff regarding the CLB in an attempt to clarify the differences between the reporting regulations. It is the staff's position that the design basis of a plant or facility is a subset of the current licensing bases, which is comprised of the UFSAR and other licensing documents and should be maintained relatively current and in a recoverable form by the licensee (Ref. 27). When considering a change to the facility, the decisions made by plant management can sometimes be based on engineering analyses and judgment, but decisions should always be made in conjunction with a thorough understanding of the design basis. Likewise, the staff needs a thorough understanding of the licensee's design basis when evaluating license amendment requests and performing safety evaluations. The staff also requires an understanding of the design basis in order to aid in its reviews of operational experience and trends and patterns.

Part 50 includes four regulations that contain reporting requirements requiring licensees to report design-basis discrepancies or to report gaps or inconsistencies in the licensing basis for the plant: Sections 50.9, 50.59, 50.72, and 50.73. Section 50.9 requires licensees to notify their respective regional administrators within 2 days when they become aware that information previously submitted to the Commission in support of issuance of their license or other licensing requirement is incomplete or inaccurate. This is a general reporting requirement which contains some redundancy with the reporting requirements of Section 50.73. For example, situations which may meet the reporting requirements of Section 50.9 would also likely meet the reporting requirements of Section 50.73. Examples of such events meeting both requirements would be inaccuracies or errors discovered in the design-basis information or information of the type the staff has relied upon to make regulatory decisions (current licensing basis). Discoveries of this type have typically been uncovered through licensee DBD efforts. Regional notification, followed with a Section 50.73 report (LER) may constitute compliance with the reportability aspect regarding important missing or inaccurate design documents.

Section 50.59 allows licensees to make changes to their facilities without prior Commission approval, as long as no unreviewed safety question exists or a change to a technical specification is not required. The rule also requires licensees to periodically report summaries of those changes it makes to their facilities that did not require NRC approval. Reviewing plant changes or modifications for the existence of an unreviewed safety question pursuant to Section 50.59 requires an understanding of the design basis in order to determine and maintain the design margins established during plant licensing. Of the design-related LERs compiled and reviewed for the Millstone peer groups survey, 48 percent were resolved by a Section 50.59 modification (see Figure 7).

Both Sections 50.72 and 50.73 require reporting of situations or conditions where licensees may find the plant operating outside of its design basis (or in an unanalyzed condition that significantly compromises plant safety). In NUREG-1397, the staff stated that the reportable condition should relate to the design discrepancy through a technical evaluation to the 50.2 design-basis definition. This meant that the regulatory design bases

were defined in the FSAR and in other docketed information, not in the system or in topical DBDs (Ref. 27). In Inspection Manual Chapter 9900, "Resolution of Degraded and Nonconforming Conditions," the staff stated that the discovery of an existing but previously unanalyzed condition or accident that significantly compromised plant safety is reportable under Sections 50.72 and 50.73, and if determined to be outside of the design basis and a significant safety concern, backfit considerations should apply (Ref. 61).

The increased focus and attention surrounding the Millstone issues has prompted the staff to revise the Enforcement Policy regarding the regulations involving reporting design-related deficiencies. In SECY-96-154, the staff discussed previously adopted enforcement discretion for old design issues which could have some applicability to noncompliance with Section 50.59. Examples that would qualify for enforcement discretion would be those licensees who identified old design issues that most likely would not have been identified through the normal routine licensee activities. However, given the current events surrounding the Millstone review, the proposed draft Enforcement Policy would be to take enforcement action for failure to report under 10 CFR 50.72 or 50.73 issues involving (1) an unreviewed safety question, (2) a conflict with a technical specification, or (3) any other Severity Level III violation associated with non-reporting (Ref. 57).

Conclusions:

On the basis of the review and analysis of the SCSS LER data, and from information drawn from a review of NRC inspection reports and other pertinent documentation, the conclusion reached by the task group is that both licensees and the staff may not have an adequate level of understanding and knowledge of the design basis for a significant number of plants. Supporting this conclusion is the number of reported design-related deficiencies found within LERs and, issues of lack of knowledge or documentation of design-basis information as reported through NRC team inspections and evaluations. The level and extent of this lack of knowledge is not known, but we surmise that it is not limited to any one group or vintage of plants.

The task group recommends considering the need to require licensees to have an adequate understanding of their design basis and to maintain their licensing basis current. The staff should also consider clarifying differences between the "design basis" and "current licensing basis" concepts and providing formal training to the staff in these areas. Streamlining regulations to clarify these issues and placing an emphasis on finalizing NUREG-1022, Revision 1, Draft 2, are recommended.

6.4.5 Correlation of Reporting Under 10 CFR 50.59, 50.72, and 50.73

Three of the principal regulations in Title 10 of the Code of Federal Regulations requiring reporting of issues that are outside of the original or current design basis are issues involving unreviewed safety questions (Section 50.59) and discoveries of existing but previously unanalyzed conditions or accidents (Sections 50.72 and 50.73). A licensee is allowed under Section 50.59 authority to make changes and modifications to its facility as described in the UFSAR without prior NRC approval if the change or modification does not involve a USQ or a change to the technical specifications (TS). Changes or modifications made under this regulation may be necessary to resolve an existing unanalyzed condition or a degraded or nonconforming condition. The discovery by the licensee of an existing

but previously unanalyzed condition or accident is reportable under Sections 50.72 and 50.73. If a USQ is involved, as might be the case if a plant modification was proposed to remedy the situation, the change may still be made, after a determination that no significant increase in the probability or consequences of an accident could occur, and after approval is granted by the NRC. The licensee also would need to submit a license amendment to update the UFSAR to reflect the change in the plant or to procedures.

Confusion has existed among licensees and staff pertaining to Section 50.59 regarding the scope, role, and definitions of key words and phrases, such as changes and modifications. Other questions have been raised about how to document USQs, once they have been recognized by the licensee. The confusion is particularly applicable when considering how Section 50.59 applies to temporary modifications installed to resolve nonconforming or degraded plant conditions and how long these "short term actions" can be considered under changes made pursuant to Section 50.59 (Ref. 62). To simplify and restate further, recognition of a nonconforming condition or an unanalyzed condition involving structures, systems, and components can be reportable, and the corrective action taken to resolve the problem also could be potentially reportable.

The sections within IMC 9900, "Technical Guidance," that address degraded and nonconforming conditions and determining operability contain guidance to NRC inspectors on how to approach these issues regarding licensees making changes and modifications in accordance with Section 50.59, determining operability and reportability, and preparing and implementing justifications for continued operation. The guidance was shared with the industry through GL 91-18.

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MILLSTONE 1 PEER GROUP (GE) DESIGN BASIS LERS

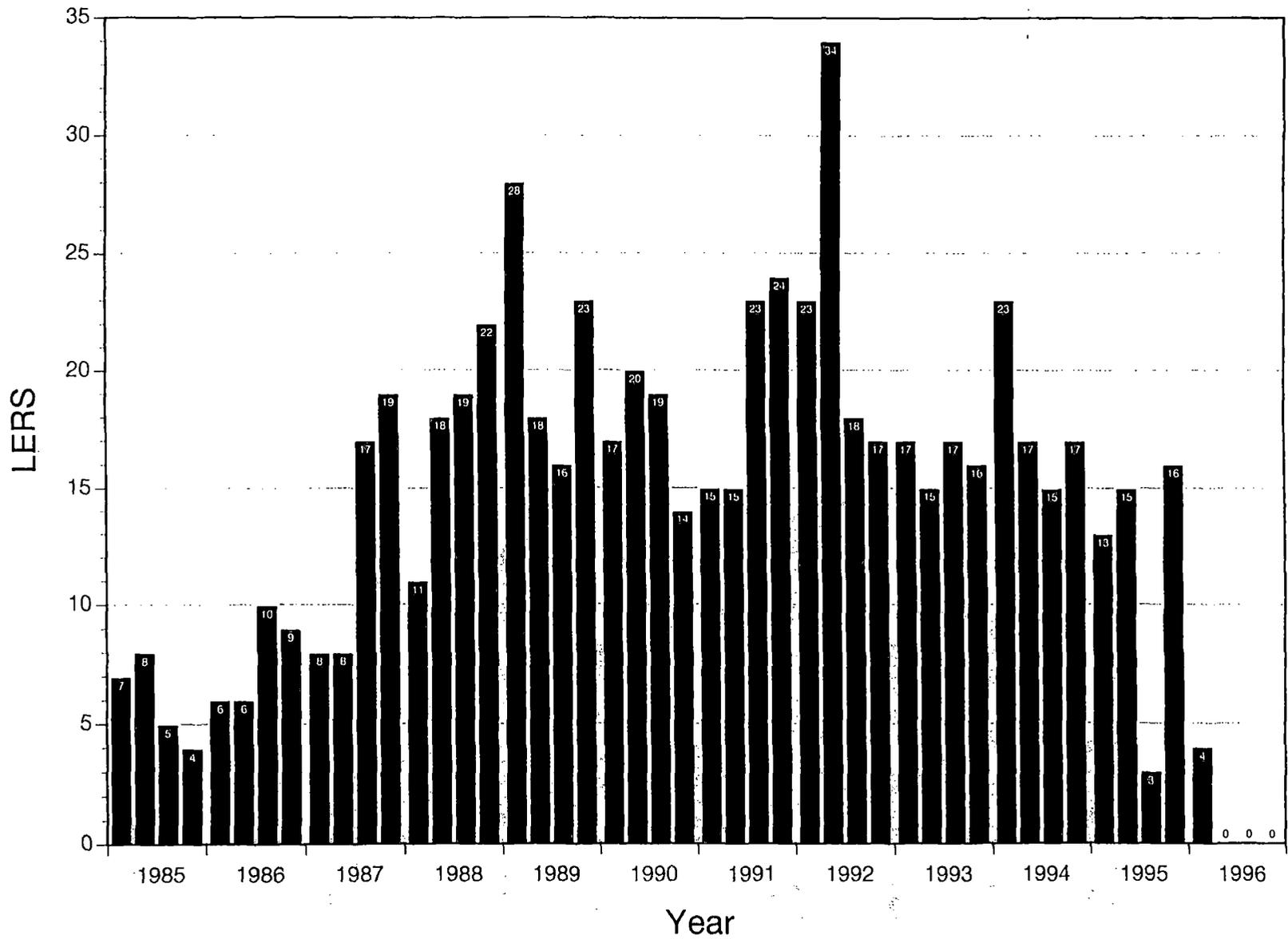
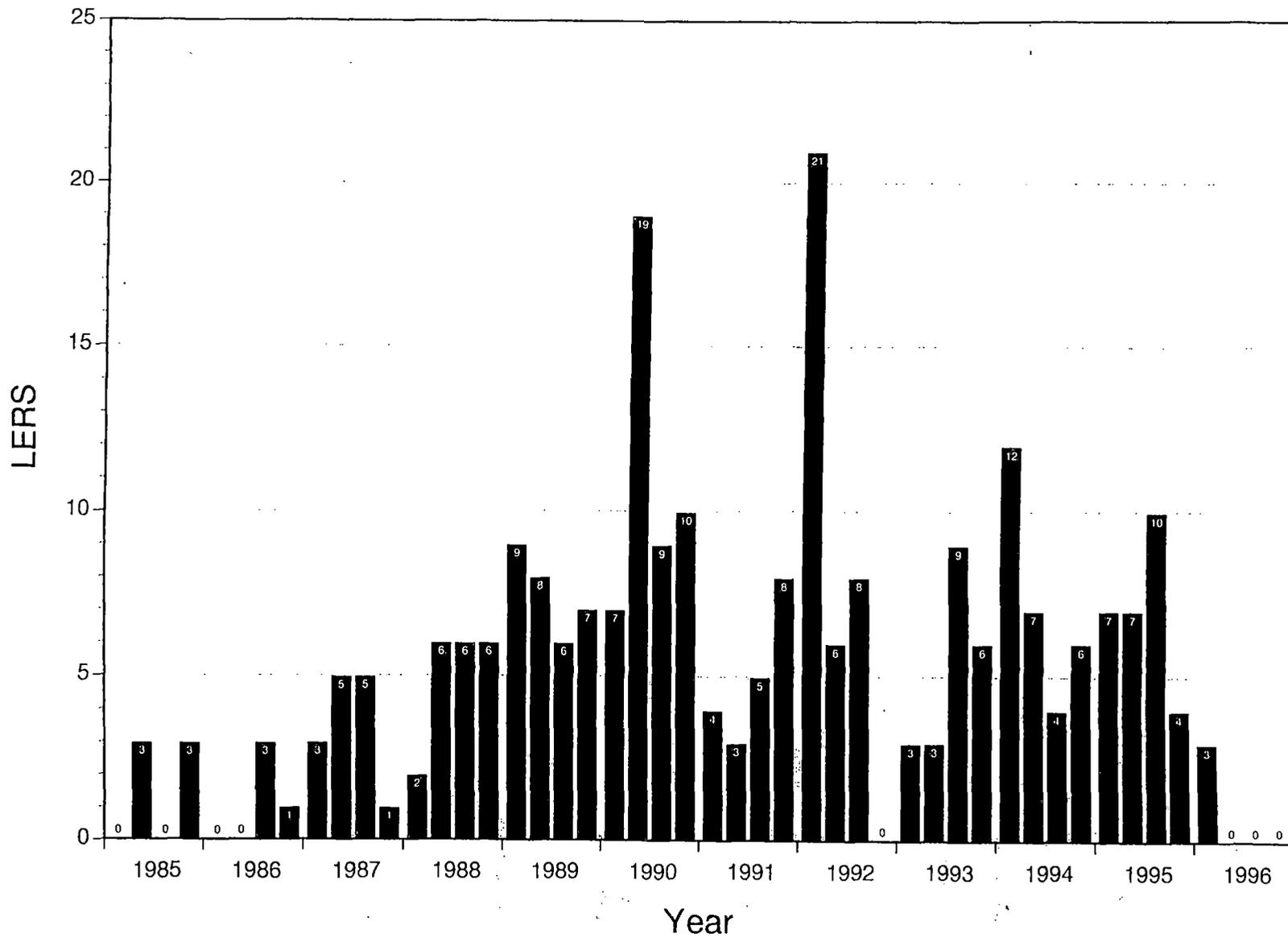


Figure 1 Millstone 1 Peer Group (GE) Design-Basis LERS

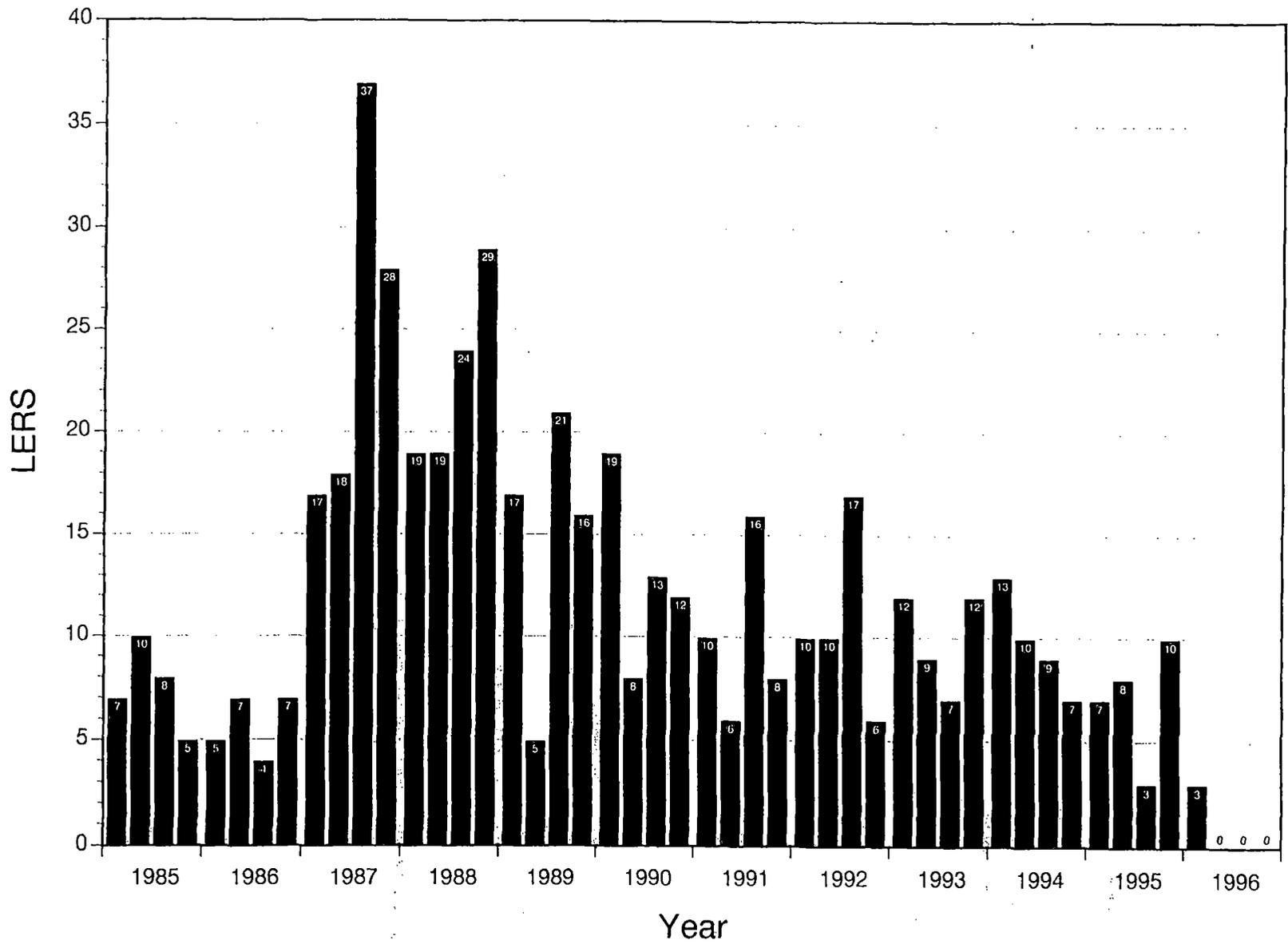
MILLSTONE 2 PEER GROUP (CE) DESIGN BASIS LERS

Figure 2 Millstone 2 Peer Group (CE) Design-Basis LERS



MILLSTONE 3 PEER GROUP (W) DESIGN BASIS LERS

Figure 3 Millstone 3 Peer Group (W) Design-Basis LERS



TOTAL LERS

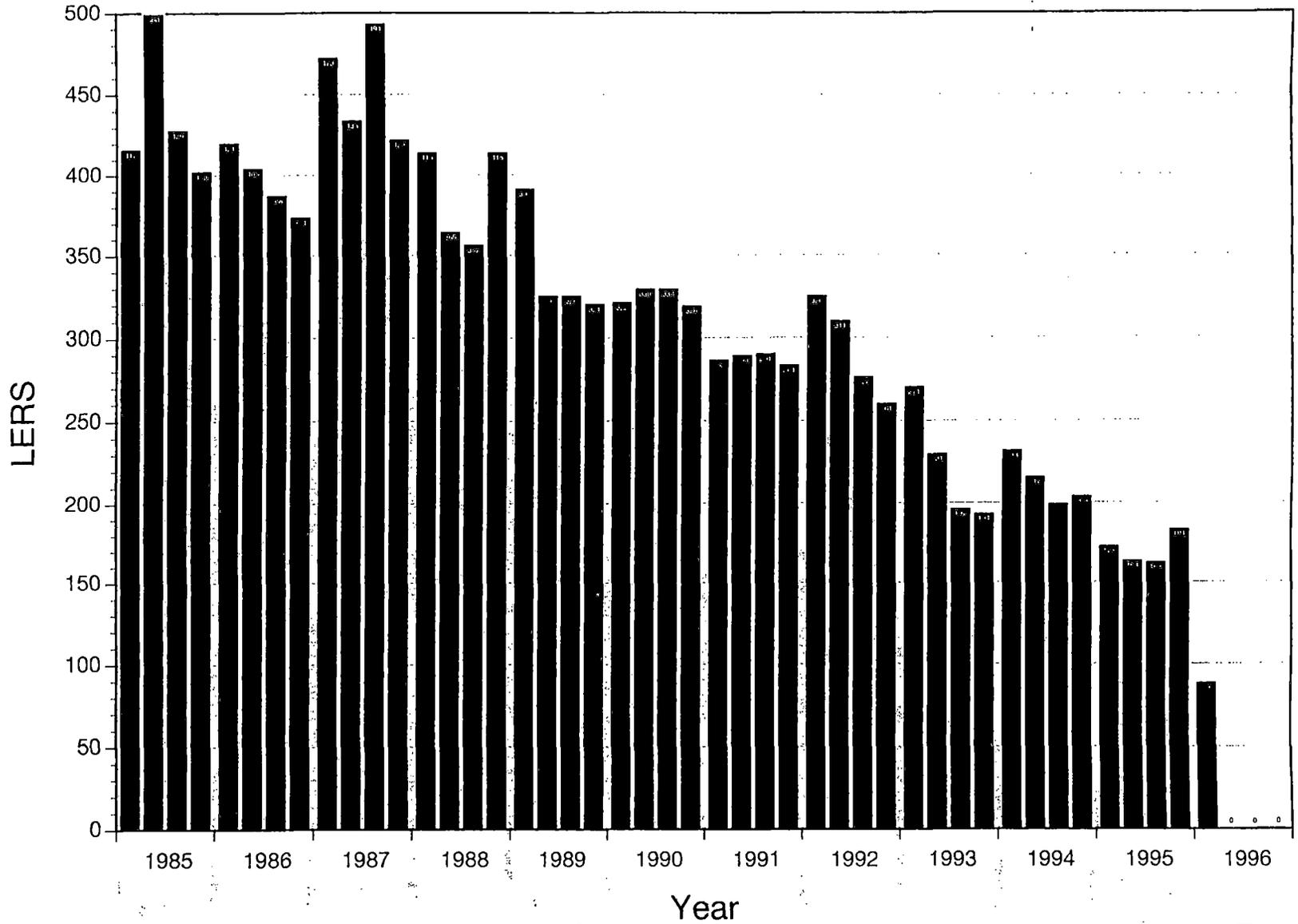


Figure 4 Total LERS 1985-1996

TOTAL DESIGN BASIS LERS

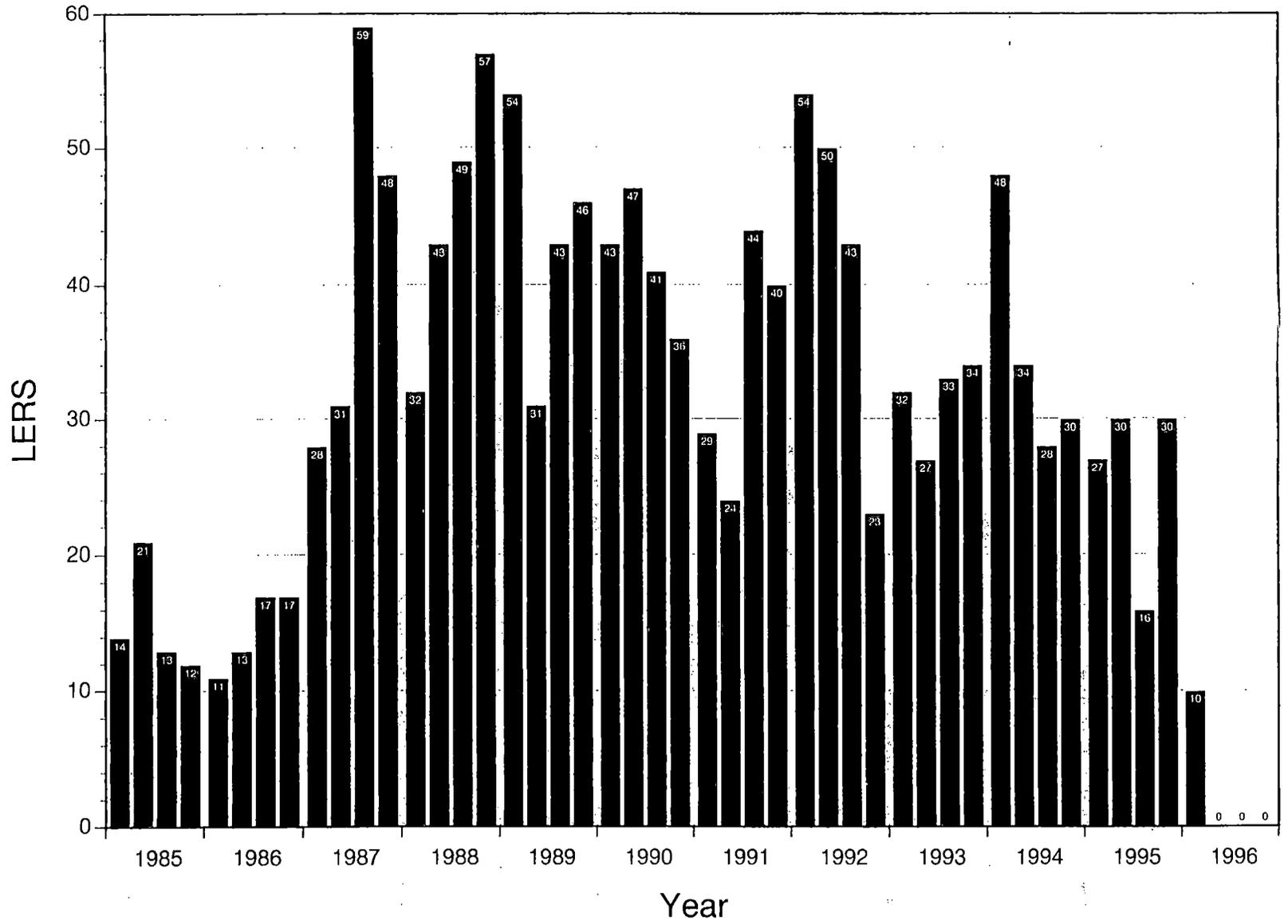
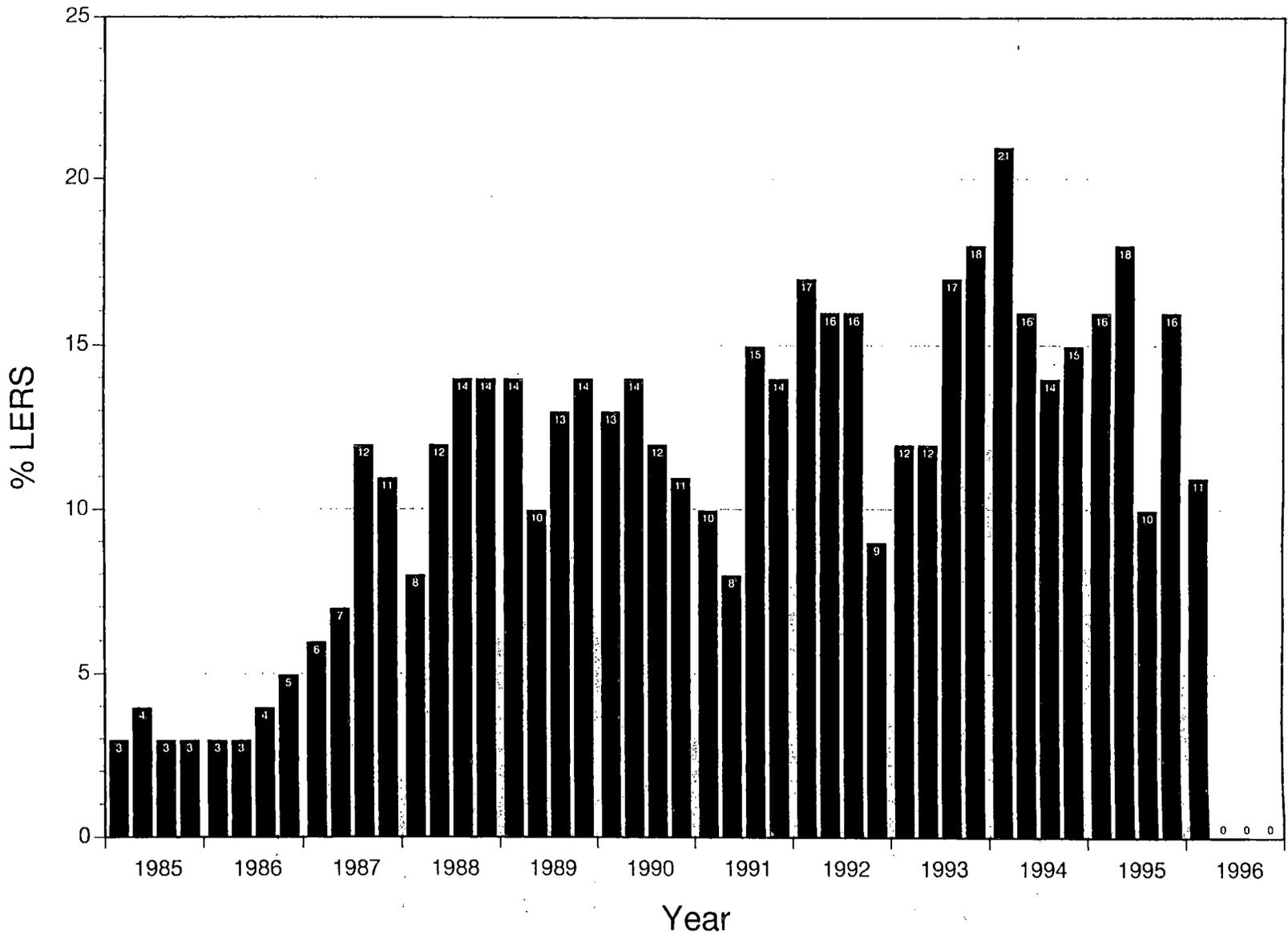


Figure 5 Total Design-Basis LERS 1985-1996

PERCENT DESIGN BASIS LERS

Figure 6 Percent Design-Basis LERS



DESIGN BASIS LERs RESOLVED

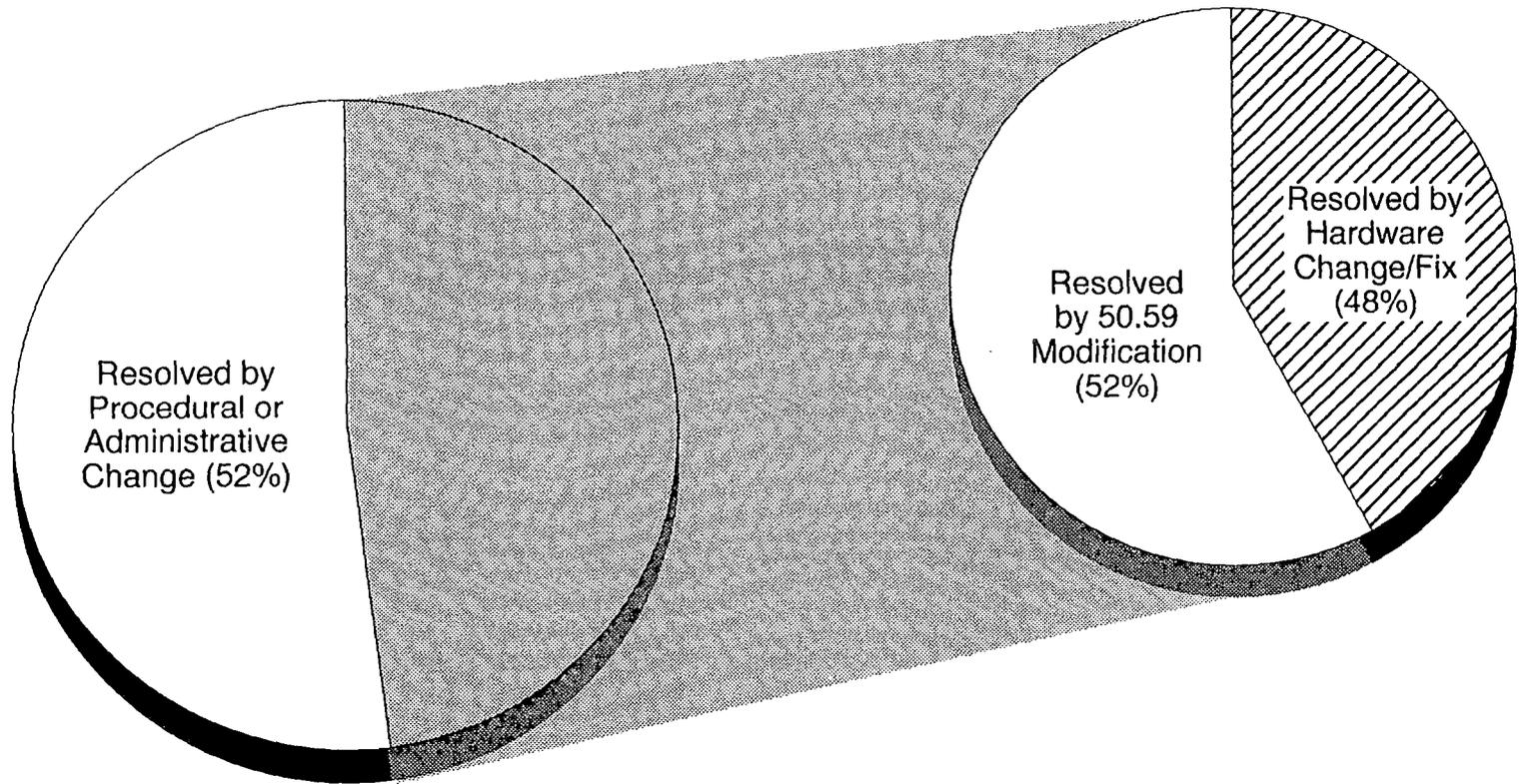


Figure 7 Design-Basis LERs Resolved

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List of Abbreviations

ACR	adverse condition report
ACRS	NRC Advisory Committee on Reactor Safeguards
ADPR	NRR Associate Director for Projects
AEC	U.S. Atomic Energy Commission
AEOD	NRC Office for Analysis and Evaluation of Operational Data
ATWS	anticipated transient without scram
B&W	Babcock and Wilcox
BWR	boiling-water reactor
CE	Combustion-Engineering
CFR	Code of Federal Regulations
CLB	current licensing basis
DBD	design-basis documentation
DBR	design-basis reconstitution
DET	diagnostic evaluation team
EATS	OE Enforcement Action Tracking System
ECCS	emergency core cooling system
EDO	NRC Executive Director for Operations
EDSFI	Electrical Distribution System Functional (Team) Inspection
EGM	enforcement guidance memorandum
ERDA	U.S. Energy Research and Development Administration
F	fahrenheit
FIP	Fundamental Inspection Program
FR	Federal Register
FY	fiscal year
FSAR	final safety analysis report
GAO	U.S. General Accounting Office
GE	General Electric Company
GL	generic letter
GSI	generic safety issue
IDI	integrated design inspection
IE	NRC former Office of Inspection and Enforcement
IFS	Inspection Followup System
IMC	inspection manual chapter
INPO	Institute of Nuclear Power Operations
IP	inspection procedure
IPE	individual plant examination
IST	in-service testing
LAN	local area network
LCO	limiting condition for operation
LER	licensee event report
LTOP	low-temperature overpressure protection
MD	management directive
NEI	Nuclear Energy Institute
NOD	notice of deviation
NOV	notice of violation
NRC	U.S. Nuclear Regulatory Commission
NRR	NRC Office of Nuclear Reactor Regulation
NTOL	near-term operating license

List of Abbreviations (Continued)

NU	Northeast Utilities
NUDOCS	NRC document management system
NUMARC	former Nuclear Management and Resources Council
NUREG	NRC technical report designation
NUREG/BR	NUREG brochure
NUREG/CR	NUREG contractor report
OE	NRC Office of Enforcement
OGC	NRC Office of the General Counsel
OIG	NRC Office of the Inspector General
OP	NRC Office of Personnel
OPP	NRC former Office of Policy Planning
ORPM	operating reactor project manager
PAT	Performance Appraisal Team
PI	performance indicator
PI	provisional instruction
PIM	plant issues matrix
PIPB	NRR Inspection Program Branch
PM	project manager
PMSB	NRR Planning, Program, and Management Support Branch
PPR	plant performance review
PRA	probabilistic risk analysis
PSAR	preliminary safety analysis report
PWR	pressurized-water reactor
QA	quality assurance
RG	regulatory guide
RIP	Revised Inspection Program
RRG	Regulatory Review Group
RRRC	Regulatory Requirements Review Committee
SALP	Systematic Assessment of Licensee Performance
SAR	safety analysis report
SBO	station blackout
SCSS	Sequence Coding and Search System
SE	safety evaluation
SECY	NRC Office of the Secretary of the Commission
SEP	Systematic Evaluation Program
SER	safety evaluation report
SES	Senior Executive Service
SIMS	NRC Safety Issues Management System
SIT	Special Inspection Team for Millstone and Haddam Neck
SMM	senior management meeting
SRM	staff requirements memorandum
SRP	Standard Review Plan
SSFI	safety system functional inspection
SSOMI	safety systems outage modifications (team) Inspection
TI	temporary instruction
TMI	Three Mile Island
TRS	text retrieval system

List of Abbreviations (Continued)

TS	technical specifications
TVA	Tennessee Valley Authority
UDP	update and development program
UFSAR	updated final safety analysis report
USI	unresolved safety issue
USQ	unreviewed safety question
<u>W</u>	Westinghouse Company
WAMS	Work Assignment Management System database

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Millstone Lessons Learned

Task Group

Report



Part 1: Review and Findings Appendices

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation

September 1996

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Appendix A

**Plan for Evaluating Lessons Learned
from Millstone-Related Activities**

**Report of the
Millstone Lessons Learned
Task Group
Part 1: Review and Findings**

April 18, 1996

MEMORANDUM TO: William T. Russell, Director
Office of Nuclear Reactor Regulation

FROM: Frank P. Gillespie, Director
Division of Inspection and Support Programs
Office of Nuclear Reactor Regulation

SUBJECT: TASK GROUP PLAN FOR EVALUATING MILLSTONE-RELATED LESSONS
LEARNED

A task group is being established to conduct the review you requested in your memorandum to me of March 20, 1996. The task group will conduct a broad-based evaluation of lessons learned from existing reviews of Millstone and related activities for their implications to our oversight processes. The group will supplement its evaluation with additional reviews of certain aspects of our programs and processes. The group will then make recommendations for revising the processes or identify areas that may require further consideration.

The task group's plan is attached for your review and approval. The first major milestone is a Commission briefing on May 31, 1996, at which the status of activities will be discussed. A final report will be prepared for the Commission's review by July 30, 1996.

Attachment: Plan for Evaluating Lessons Learned
from Millstone-Related Activities

cc: J. Taylor, EDO
J. Milhoan, EDO
E. Jordan, AEOD
J. Lieberman, OE
A. Thadani, NRR
R. Zimmerman, NRR
D. Crutchfield, NRR
T. Martin, RI
S. Ebnetter, RII
H. Miller, RIII
L. Callan, RIV

CONTACT:
Steven R. Stein, NRR
415-1296

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

I. TASK CHARTER

The task group will identify the problems and deficiencies in our regulatory processes that allowed an environment to develop that ultimately resulted in the situation at Millstone, and make recommendations for correcting the problems and deficiencies. The task group will draw on the information and findings of existing inspections and reviews associated with the issues raised by Millstone's core off loading practices, and will conduct independent reviews and analyses as necessary.

The task group will broadly consider the NRC's regulatory program for power reactors and determine the implications of the lessons learned on the program and the policies that provide direction for the program. The group will address four general areas:

- Licensing
- Inspections
- Enforcement
- Licensee reporting

II. OBJECTIVES

- A. To identify the root causes for deficiencies in regulatory programs associated with issues raised at Northeast Utilities from reviews of recent NRC and licensee activities, and a review of NRC's inspection record.
- B. To make recommendations for changing existing regulatory programs and processes, or establishing new processes, to eliminate the identified deficiencies and assign priorities to and establish a schedule for implementing the recommendations.
- C. To evaluate the information gathered for its broad implications for the agency's policies that provide the direction for its regulatory processes.

III. TASK GROUP MEMBERS

The task group will consist of the following individuals who will have the indicated responsibilities.

- | | |
|-----------------------------------|---------------------|
| A. Group leader: | Steven Stein, DISP |
| B. Inspection/recordation member | David Nelson, DISP |
| C. Licensing/projects member | Richard Clark, DRPE |
| D. Licensee reporting member | John Thompson, AEOD |
| E. Enforcement/recordation member | Robert Pettis, PSIB |

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

IV. ASSOCIATED ACTIVITIES

A. The major activities associated with the issues raised at Northeast Utilities are identified below, along with the responsible individuals for those activities, the nature of our commitment, and the due dates for reporting the activities.

ACTIVITY	RESPONSIBLE INDIVIDUAL	COMMITMENT	DUE DATE
FSAR inspections and NRC responsiveness to issues	M. Davis	WITS 9600006 (Comm. brief 5/29)	5/01/96
SFP licensing basis survey	J. Shea		4/09/96
Engineering vertical slice	M. Shannon		5/1/96
50.59 action plan and inspection guidance	E. McKenna	EDO 779, 12/15/95	4/15/96
Onsite inspection team	M. Virgilio		5/17/96
Employee concerns & allegations review	J. Hannon		5/01/96
Review of layoff practices	D. Dambly		3/17/96
Lessons learned overview (Comm. brief status)	S. Stein	WITS 9600006 Comm brief 5/29/96	05/22/96
'Lessons learned review	S. Stein	Russell memo 3/20/96 SRMs 11/30/95, 7/11/96	08/15/96
IMC 0350 restart panel	J. Durr		

B. Other Sources for Relevant Information

1. Gene Imbro: CLB and commitment management efforts
2. OI and OIG reports on Millstone SFP and refueling issues
3. Regulatory Review Group report

V. TASK GROUP ACTIVITIES

The task group will collect and analyze the findings from the existing activities and supplement that information with independent reviews and analyses in each of the following four general areas. Although the group's focus will be in these areas, the group is not restricted to them. The group will evaluate the implications of its findings to the policies and current directions of the existing programs and processes; such as the change in controls on bases from standard technical specifications; the effects of performance-based regulation on licensing actions, verification of licensing actions and commitments; and compilation of licensing bases.

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

A. Licensing

1. Responsible Task Group Member: Licensing/projects
2. Tasks: The task group will analyze the processes for maintaining and controlling the licensing basis for power plant reactors. It will evaluate the interrelationship and sharing of responsibilities between licensing functions and inspection functions. The group will consider the effects of licensees implementing standard technical specifications on licensing actions and controlling licensing bases. It will make recommendations for changing the processes or regulations.
 - a. Existing Activities
 - (1) 50.59 action plan
 - (2) Onsite inspection team
 - (3) SFP review
 - (4) OIG reports
 - b. Additional Reviews
 - (1) How PM's manage or maintain licensing basis
 - (2) How significant licensing actions are verified
 - (3) Definition and control of "licensing basis"

B. Inspections

1. Responsible Task Group Member: Inspection/recording
2. Tasks: The task group will document the history of the inspection program's verification of design and licensing bases and requirements. It will describe how the inspection program's focus changed in relation to changes in industry-wide performance. It will determine the requirements and guidance within the current program related to verifying FSAR descriptions and bases, verifying licensing bases, and verifying the reporting of changes to bases; and make recommendations for changing the program. The task group will also review and evaluate the level of detail and method of recording discrepancies in and noncompliance with licensing bases.

The inspection program is a high priority aspect of the task group's scope.

- a. Existing Activities
 - (1) Onsite inspection team
 - (2) FSAR inspections responsiveness to issues
 - (3) Vertical slice engineering inspections
- b. Additional Reviews
 - (1) Review of inspection program and procedures
 - (2) Review of engineering and 50.59 inspections
 - (3) Historical analysis

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

- (4) Analysis of reported events related to design and licensing bases
- (5) Determining regulatory basis for information and processes the NRC inspects related to commitments

C. Enforcement

1. Responsible Task Group Member: Enforcement/recordation
2. Tasks: The task group will analyze the results of current FSAR inspections and changes to enforcement policy and guidance related to discrepancies found in FSARs. It will make recommendations for changes to the inspection program for consistency with enforcement guidance.

The enforcement aspect of the task group's scope has a high priority because of its nexus with the inspection program.

- a. Existing Activities
 - (1) Onsite inspection team
 - (2) Enforcement guidance
 - (3) FSAR inspections and responsiveness to issues
- b. Additional Reviews
 - (1) Review enforcement history on design basis or licensing basis issues
 - (2) Review the method and sufficiency of recording enforcement of deviations from licensing bases
 - (3) Review the compliance basis upon which commitments are dealt

D. Licensee Reporting

1. Responsible Task Group Member: Licensee reporting
2. Tasks: The task group will review and analyze the previous and current studies of reporting requirements related to the FSAR, design basis, and changes to them. The task group will make recommendations to change processes or regulations.
 - a. Existing Activities
 - (1) 50.59 review efforts
 - (2) Previous CLB audits
 - (3) Previous Regulatory Review Group findings and recommendations
 - b. Additional Reviews
 - (1) Review and analysis of reportable events

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

VI. ADDITIONAL REVIEWS

A. How PM's manage or maintain licensing basis

The location of and ability to retrieve licensing basis information will be determined. The ability to identify changes that have been made to existing bases also will be determined. The task group will review several major regulatory issues that should have affected FSARs (i.e., SBO, shutdown risk, GLs 83-28, 88-17 and 88-10). Current instructions to PMs (i.e., handbook, office letters) will be reviewed.

B. How significant licensing actions are verified

The task group will determine how significant licensing actions are verified by the NRC. It will evaluate how generic and plant specific actions are factored into the inspection program.

C. Definition and control of "licensing basis"

The task group will reevaluate the Regulatory Review Group's recommendations for changes to regulations associated with "licensing basis," changes to the basis, and reporting.

D. Review of inspection program and procedures

The task group will identify the references to FSARS, design requirements, licensing requirements, and related reporting requirements contained in inspection program documents (manual chapters and procedures). It will evaluate the appropriateness of related inspection requirements vice inspection guidance and the types of inspections that reference the information.

E. Review of engineering and 50.59 inspections

The task group will review recent engineering and 10CFR50.59 inspections to determine how they are implemented. The review will focus on determining if the inspections verify that changes in the plants are reflected in the FSAR.

The task group will also evaluate how discrepancies in and noncompliance with licensing bases are recorded during inspections.

F. Historical analysis

The task group will determine the major changes in the inspection program related to design and licensing bases verification from the mid 1980's to the present. These changes may include deemphasizing FSARs at plants transitioning from construction to operations, initiating engineering-based inspections (vertical slice) then reducing the numbers as the industry begins doing its own. The group will relate these changes to the industry's

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

overall performance and to specific industry initiatives, such as design basis reconstitution.

- G. Analysis of reported events related to design and licensing bases

The task group will identify the number of reportable events related to design or licensing bases over time. It will analyze the data to determine any correlations with other industry or inspection milestones.

- H. Determining regulatory basis for information and processes the NRC inspects related to commitments

The task group will correlate licensing basis information and change and control processes related to commitments made by licensees to associated NRC regulations and requirements. The group will evaluate the sufficiency of controls and inspections of commitment-related information. It will evaluate how GL 91-18 was implemented by licensees and how implementation was verified by the NRC.

- I. Review enforcement history on design basis or licensing basis issues

The group will identify and analyze enforcement actions taken in response to issues relating to design and licensing bases, FSAR inconsistencies, and reporting requirements.

- J. Review the method and sufficiency of recording enforcement of deviations from licensing bases

The task group will analyze NRC records of enforcement actions taken for discrepancies in and noncompliance with licensing bases. The level of detail of associated information and the method of recording the information will be evaluated.

- K. Review the compliance basis upon which commitments are dealt

The task group will evaluate the Regulatory Review Group's recommendations on commitments and the associated regulations and enforcement associated with compliance with commitments.

VII. COORDINATION

The task group will report through DISP management to the DNRR. Its members will be chosen from NRR projects divisions or NRR technical assessment divisions, the Office of Enforcement, and AEOD. The task group will draw on the results of various activities coordinated through the Director, Northeast Utilities Projects. It will interface with those responsible for the activities directly to learn of their insights and findings at the earliest time.

PLAN FOR EVALUATING LESSONS LEARNED FROM MILLSTONE-RELATED ACTIVITIES

The task group leader will brief the DNRR monthly, and other agency managers as needed. He will frequently discuss the status and direction of the activities with DISP managers and the Director, Northeast Utilities Projects.

VIII. TASK GROUP REPORT

A. For the May 31st Commission Briefing

A summary of the efforts on 50.59 guidance and FSAR inspections (including the spent fuel pool surveys) to date. The briefing paper will discuss the four general areas that may need corrective actions. It will discuss:

1. The current activities and what we are learning from them
2. Preliminary analysis of what the information means to our programs and processes
3. Short term actions taken or that will be taken
4. Longer term actions that potentially we will take

B. For the final report (due July 20, 1996)

A preliminary discussion of what within our processes led to the problems illustrated by Millstone. Identification of short term actions and long term options.

IX. SCHEDULE

A.	Finalize Plan	4/12/96
B.	Assign people, start review Distribute plan to RAs	4/19/96
C.	Monthly DNRR briefings	4,5,6,7/96
D.	Brief EDO	5/16/95
E.	Chairman briefing	5/22/96
F.	Slides for Commission briefing	5/24/96
G.	Commission briefing	5/31/96
H.	Draft report to W. Russell	7/31/96
I.	Draft report to EDO and Commission	8/15/96
J.	Management/regional/inspector review	10/15/96
K.	Final report to Commission w/recommendations	10/30/96

Appendix B

**Survey Questions
for Inspectors and NRR Project Managers**

**Report of the
Millstone Lessons Learned
Task Group
Part 1: Review and Findings**

NOTE TO: All Project Managers
FROM: Millstone Lessons Learned Task Force
SUBJECT: FSAR AND 10 CFR 50.59 SURVEY

There are a number of groups evaluating the lessons learned from the developments at Millstone for their implications to NRC's oversight processes (e.g., the SFP licensing basis survey). To accomplish its objectives, the task force needs to better understand agency processes that are not well documented and learn how project managers are using the UFSAR for their plant and the extent of reviews performed by project managers on the reports submitted by licensees pursuant to 10 CFR 50.59 and 50.71(e). The elements and standards in the non-SES performance plan for project managers are not very specific regarding reviews by the project managers of the 10 CFR 50.59 reports and 50.71(e) UFSAR changes. One of the standards for element no. 1 states that the project manager demonstrates "familiarity" with licensee documents and correspondence, including among other items, the FSAR and FSAR updates. Of the six items in element no. 5, one states that the project manager "periodically review Part 50.59 evaluations performed by the licensee for the assigned facility."

The task force is requesting your cooperation in responding to the attached survey, which should take less than 10 minutes to complete. Responding to the survey has been authorized by the Associate Director for Projects. To provide anonymity (and, hopefully, a more candid response), you do not have to list the plant name if you do not wish to do so. Please return the completed survey by June 7, 1996, to a mail box set up in 14G-8 (an unoccupied cubicle) or forward in a plain envelope to Dick Clark (MS 14E-4). The task force would also appreciate any suggestions or comments regarding the content of UFSARs, tracking licensee commitments, maintaining NRR's record of a plant's licensing basis, 10 CFR 50.59 reviews and inspections and other project manager activities. Feel free to expand on any of your responses.

Enclosure: Survey form

cc w/encl: R. Zimmerman
S. Varga
J. Roe
J. Zwolinski
E. Adensam
DRPE/DRPM Project Directors

CONTACT: R. Clark
415-1465

SURVEY OF PROJECT MANAGERS

REGARDING

REVIEW OF LICENSEE'S REVISIONS TO UFSAR

EVALUATION OF LICENSEE'S 10 CFR 50.59 PROGRAMS

PLANT _____ (optional)

- 1a. Is your project manager's copy of the UFSAR complete and up-to-date? Have all amendments or revisions to the UFSAR submitted by the licensee in accordance with 10 CFR 50.71 been incorporated in your copy of the UFSAR?

_____ yes _____ no

- 1b. If yes, did you update the UFSAR in the past several months as part of the Millstone lessons-learned experience?

_____ yes _____ no

- 2a. For the last licensee update or revision to the UFSAR, did you review and evaluate the changes/revisions?

_____ yes _____ no

- 2b. Was your review of the UFSAR documented?

_____ yes _____ no

- 2c. If documented, where?

___ Notes on submittal ___ Memo to File ___ PDR ___ Other (describe)

3. For the last licensee update or revision to the UFSAR, did you issue a TAC and work request to the technical staff to evaluate one or more of the revisions?

_____ yes _____ no

4. Do you and/or the technical staff that are evaluating proposed license amendments or other proposed licensing actions review the pertinent sections of the UFSAR?

_____ most of the time _____ sometimes _____ rarely

5. For the last license amendment or significant licensing action (e.g., relief requests) for which the staff's approval was based, at least in part, on the licensee performing some action (e.g., compensatory measures, alternative equipment available, etc.), was the licensee's action verified?

_____ yes _____ no _____ don't know

PM Survey

6a. If the action in 5. above, was verified, how was it verified?

PM RI/SRI Region Other

6b. Was the verification documented?

yes no

7. For the last report submitted by the licensee pursuant to 10 CFR 50.59 of changes, tests and experiments regarding the facility, did you review and evaluate the changes described by the licensee?

yes no

8. For the last 10 CFR 10 50.59 submittal, did you request the licensee to provide additional information on a change or modification described in the report?

yes no

9. On the last 10 CFR 50.59 submittal, did you issue a TAC and work request to the technical staff to review and evaluate one or more of the changes described by the licensee in their report?

yes no

10. Do you maintain a file of the reports submitted by the licensee pursuant to 10 CFR 50.59?

yes no

11. How did you document the results of your last in-office review of the licensee's 10 CFR 50.59 report?

memo to file annotated licensee's submittal

not documented other (describe)

12. If you have performed an evaluation or inspection of the licensee's 10 CFR 50.59 program, either on-site or at the corporate office, what was the basis for the assessment?

considered part of the PM's duties

interest or concern regarding a change or modification

other (describe)

PM Survey

13. Have you performed an on-site assessment of the licensee's 10 CFR 50.59 program? If you have, what was the approximate month and year of your last on-site review?
_____ yes _____ no _____ date
14. Did your last on-site assessment of the licensee's 10 CFR 50.59 program, include a review and evaluation of design modification packages, including engineering analyses and calculations?
_____ yes _____ no _____ no on-site review performed
15. For your last on-site inspection of the licensee's 10 CFR 50.59 program, did you use inspection procedure 37001?
_____ yes _____ no _____ no inspection performed
16. How were the results of your last on-site evaluation or inspection of the licensee's 10 CFR 50.59 program documented?
_____ feeder to resident or regional inspection report
_____ NRR memorandum summarizing site visit
_____ NRR inspection report
_____ assessment not documented
_____ other (describe)
17. Do you feel you need additional training to conduct on-site reviews or inspections of the licensee's 10 CFR 50.59 program?
_____ yes _____ no

Comments/Recommendations

June 18, 1996

TO: Selected Regional and Resident Inspectors

FROM: Millstone Lessons Learned Task Group

SUBJECT: INSPECTOR SURVEY

There are a number of groups developing lessons learned from the issues raised by Millstone (e.g., the SFP licensing basis survey, on-site inspection team). Bill Russell, DONRR, established a task group, the Millstone Lessons Learned Task Group, to assess all the lessons learned from these other activities for their implications to NRC's oversight processes and overall agency programs. To accomplish its objectives, the task force needs to better understand certain agency processes that are not well documented and learn, among other things, how inspectors and project managers are using the UFSAR for their activities and the extent of reviews performed by inspectors and project managers on the reports submitted by licensees pursuant to 10 CFR 50.59 and 50.71(e).

The task force is requesting each region's cooperation in responding to the attached survey, which is similar to one the task group recently sent to all power reactor PMs. This survey is intended for DRS and DRP inspectors who perform inspections at power reactors in operations, engineering and maintenance areas, i.e., not security, health physics, emergency planning and training/operator licensing. This is not limited to full time inspectors but should include, for example, DRP project engineers who may participate in inspections from time to time. Likewise, operator license examiners who also perform operations, engineering, and maintenance inspections should be included.

The survey should only take about 10 minutes to complete and we would like as many inspectors as possible (even those assigned to the same site) to complete the questionnaire. We ask each region's assistance to identify the inspectors meeting the above description and to distribute this message and the attached survey to them.

The task group is not interested in associating responses to individuals or plants, therefore the survey does not ask for any information that would identify the inspector or plant. However, we are on a tight schedule and would like responses submitted via email for timeliness. Access to the email address will be restricted and the emails will not be retained after we retrieve the survey response. Any individual who wishes to remain absolutely anonymous may send a paper copy via interoffice mail, but the group cannot guarantee it will arrive in time to be considered. Feel free to expand on any of your responses.

For each inspector identified by the region, please respond by Wednesday June 26, either by emailing your answers to SURVEY or sending a hard copy to Steven Stein NRR/DISP, M/S O-12E4.

Questions concerning this request may be directed to Steve Stein at 301-415-1296, email SRS, or Dave Nelson, 301-415-1281, email DJN.

Thank you for your assistance. We plan on communicating the results of the survey to the regions upon completion of this project.

Inspector Survey

1.a. What inspector assignment do you currently occupy?

- Resident
- Region based
- other, (specify) _____

b. How long have you been an NRC inspector in all assignments?

- years Resident
- years Region based
- years other, (specify) _____

2.a. What are the sources of information you relied upon in order to learn how to perform the non-technical aspects of your job? Estimate the percent contribution of each source. Examples of non-technical aspects are licensing, report writing, conduct of inspections, inspection program requirements, enforcement, interface with licensees, etc.

- % formal education
- % formal NRC provided training
- % on-the-job training
- % general engineering experience
- % previous job experience
- % other, explain: _____
- 100 %

b. What are the sources of information you relied upon in order to learn how to perform the technical aspects of your job? Estimate the percent contribution of each source. Examples of technical aspects are plant operation, maintenance, engineering, modifications, welding, NDE, radiological controls, etc.

- % formal education
- % formal NRC provided training
- % on-the-job training
- % general engineering experience
- % previous job experience
- % other, explain: _____
- 100 %

3. How often do you consult Inspection Procedures or the Inspection Manual?

- always prior to or during an inspection
- frequently
- sometimes
- infrequently
- never

Inspector Survey

4.a. Have you ever been tasked to verify assumptions or licensee actions related to a license amendment or other licensing action?

- yes
- no

b. If yes, for the most recent occurrence, how was this assigned?

- informal request
- written request
- from NRR, Region.
- program requirement
- other, (specify) _____
- N/A

c. How were the results of your actions documented?

- informal reply
- written reply (e.g. memo)
- inspection report
- other, (specify) _____
- N/A

5.a. During the closeout process for LERs and NOVs that you close, what is the usual status of associated long term (not immediate) corrective actions?

- | LERs | NOVs |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> always fully complete |
| <input type="checkbox"/> | <input type="checkbox"/> fully complete except for rare circumstances |
| <input type="checkbox"/> | <input type="checkbox"/> initiated, but not necessarily fully complete |
| <input type="checkbox"/> | <input type="checkbox"/> planned and scheduled, but not necessarily initiated |
| <input type="checkbox"/> | <input type="checkbox"/> other, explain _____ |

b. What is your understanding of program/management expectations for the status of LER and NOV long term corrective actions necessary for closure?

- | LERs | NOVs |
|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> always fully complete |
| <input type="checkbox"/> | <input type="checkbox"/> fully complete except for rare circumstances |
| <input type="checkbox"/> | <input type="checkbox"/> initiated, but not necessarily fully complete |
| <input type="checkbox"/> | <input type="checkbox"/> planned and scheduled, but not necessarily initiated |
| <input type="checkbox"/> | <input type="checkbox"/> other, explain _____ |

Inspector Survey

c. For items that you have closed with outstanding corrective actions, what was the basis for the closure? (If more than one applies, estimate percentage of occurrence.)

- inspection program/procedure allowed incomplete corrective actions
- low regulatory significance relative to other inspection demands
- age of the open item
- other, (specify) _____
- N/A

d. What percentage of all long term corrective actions considered complete by the licensee do you independently verify prior to closure?

%

6.a. Do you feel inordinate pressure to keep the open items backlog small?

- yes
- no

b. If yes, are there reasonable accommodations for older issues remaining open when necessary?

- yes
- no
- N/A

7. For recent instances in which NRR was consulted regarding a specific plant (non generic) issue(s):

a. What was the method of communication?

- informal request
- formal request (e.g. TIA)
- other, (specify) _____

b. Were the response times appropriate for the issue(s)?

- yes
- no

c. Was a technically defensible solution obtained?

- yes
- no

d. Overall, is NRR providing good support for inspection related issues?

- yes
- no

Please explain any negative responses.

Inspector Survey

8. Prior to the recent specific guidance on the FSAR as it relates to inspection activities, how often did you consult/review the plant specific FSAR?

- routinely
- frequently
- rarely

The following two questions are limited to SRIs in order to get only one response per site.

9. For Senior Residents: Prior to the recent increased emphasis regarding 50.59 and the FSAR did you or another resident at your site routinely review the licensee's 50.59(b)(2) report? FSAR 50.71(e) update?

- | | |
|------------------------------|------------------------------|
| 50.59(b)(2) | 50.71(e) |
| <input type="checkbox"/> yes | <input type="checkbox"/> yes |
| <input type="checkbox"/> no | <input type="checkbox"/> no |
| <input type="checkbox"/> N/A | <input type="checkbox"/> N/A |

10.a For Senior Residents: Who performed the most recent IP 37001 inspection (50.59 review) at your site?

- you or another resident at your site
- region based inspector
- NRR Project Manager
- other, (specify) _____
- N/A

b. If the IP 37001 inspection was performed by the Project Manager, how was the inspection documented?

- feeder to resident or region inspection report
- memo from PM
- other, (specify) _____