

POLICY ISSUE
INFORMATION

SECY-00-0141

June 23, 2000

FOR: The Commissioners
FROM: William D. Travers
Executive Director for Operations
SUBJECT: COMPLETION OF STAFF FOLLOWUP ACTIVITIES RELATED TO ADEQUACY AND AVAILABILITY OF DESIGN BASES INFORMATION

PURPOSE:

To inform the Commission of the completion of the staff followup inspection related activities described in [SECY-97-160](#), "Staff Review of Licensee Responses to the [10 CFR 50.54\(f\)](#) Request Regarding the Adequacy and Availability of Design Bases Information," dated July 24, 1997.

SUMMARY:

On October 9, 1996, the NRC staff issued a letter to power reactor licensees pursuant to [10 CFR 50.54\(f\)](#) that required licensees to provide information regarding programs and processes designed to control and maintain the facility's design bases information. The followup inspections performed subsequent to the receipt of responses determined that, in general, the inspected systems and components were capable of performing their safety functions. In some cases, prompt corrective actions were required to resolve operability concerns and several escalated enforcement actions were taken. Overall, however, licensee programs and procedures for maintaining design bases were generally effective. The followup inspection related activities described in [SECY-97-160](#) have been completed, and no further generic action is planned.

The followup NRC inspection reports and licensee event reports (LERs) described conditions in which the plant designs were not in compliance with plant design bases. The staff determined, as discussed below, that several of these issues were risk significant. In the staff requirements memorandum on [SECY-97-205](#), "Integration and Evaluation of Results from Recent Lessons-Learned Reviews," the Commission directed the staff to develop guidance on the type of information to be considered as design bases information. A paper addressing this issue, [SECY-00-0047](#), "Draft Regulatory Guide Providing Guidance and Examples for Identifying [10 CFR 50.2](#) Design Bases," was provided to the Commission on February 23, 2000. This guidance, combined with the proposed changes to [10 CFR 50.72](#) and [10 CFR 50.73](#) reporting requirements ([SECY-00-0093](#)), should enable the staff to provide a more appropriate safety focus on design bases issues.

During the development of the framework for the new reactor oversight process (ROP), the staff, as a result of lessons learned during the followup inspections described in [SECY-97-160](#), recognized the need for a continued inspection focus on licensee control of their design bases, and has included within the baseline inspection program a biennial safety system design and performance capability inspection at each plant. These inspections are intended to periodically assess implementation of the licensee design control programs.

BACKGROUND:

NRC team inspections during 1995 -1996 identified concerns regarding the ability of licensees to maintain and implement the design bases at certain plants. Considering the potential scope of these concerns and the need to ascertain the extent of the problems within the population of operating reactors, the staff proposed that licensees be required to provide information regarding the availability and adequacy of design bases information. Following the Commission's approval, the NRC issued a letter to each licensee in accordance with [10 CFR 50.54\(f\)](#) requesting the licensee to describe the programs and processes established to control and maintain operations within the facility's design bases. Additionally, the licensees were asked to discuss the effectiveness of these programs and processes.

In [SECY-97-160](#), the staff described a four-phased approach to the review of the licensee responses to the [10 CFR 50.54\(f\)](#) request. The [SECY](#) paper described the completion of the first three phases, which consisted of reviewing the licensee responses to identify significant regulatory concerns requiring prompt NRC followup, demonstrating the feasibility of the review process and review criteria, and reviewing all responses using the revised process and review criteria. For the last phase, the staff recommended that certain followup activities be performed. After reviewing the licensee responses, the staff concluded in [SECY-97-160](#) that all licensees had established programs and procedures to maintain the design bases of their facilities and determined that no further generic action would be required after the completion of the last phase.

The staff recommended the followup activities either because of the staff's concern about the performance of particular licensees in controlling facility design bases or because there was a need to validate the effectiveness of a particular element of a licensee's design control program. The range of followup activities included the prioritization of sites for design inspections, performance of safety system functional inspections (SSFIs), augmentation of safety system engineering inspections (SSEIs) to specifically review some aspect of a licensee's design control program, and augmentation of routine inspections to review licensee design control initiatives outlined in the [10 CFR 50.54\(f\)](#) responses, as well as related corrective

actions. These followup activities were conducted in 1997-1999.

DISCUSSION:

The following actions were completed as described in SECY-97-160:

- Design inspections were performed at 21 sites by three inspection teams, with each team consisting of an NRR team leader and five contractors from architect-engineer firms. The candidate plants were selected and prioritized after taking into consideration each licensee's response to the 10 CFR 50.54(f) letter, the plant's age, and the results of plant performance reviews. The teams reviewed design and licensing bases, calculations, operating procedures, safety analysis reports, drawings, and modifications for one or two risk-significant systems at each site.
- The staff determined that inspection of conformance with design bases should continue to be emphasized. Accordingly, a new inspection procedure (IP) 93809, "Safety System Engineering Inspection (SSEI)," was issued to provide another method of assessing a licensee's engineering effectiveness through an in-depth review of engineering calculations, analyses, and other engineering documents. The SSEI is similar in concept to an SSFI and the design inspections described earlier, albeit with a reduced scope and a smaller resource commitment.
- Manual Chapter 2515, Appendix A, "Core Inspection Program Procedures," was revised to allow regions the flexibility to choose one of the three following inspection procedures to perform engineering inspections at each site: IP 37550, "Engineering"; IP 93801, "Safety System Functional Inspection (SSFI)"; and IP 93809, "Safety System Engineering Inspection (SSEI)."
- Routine engineering inspections performed as a part of the core inspection program were customized to allow for the review of site-specific concerns, such as design control, configuration control, and corrective actions.

Approximately 70 design, engineering, and safety system performance inspections were performed between January 1997 and August 1999. In addition, a number of followup inspections were performed to close out the identified design issues. The total NRC resource expenditure (including NRC contractors) for design and engineering-related inspections was approximately 32 full-time equivalent (FTE) positions. These resource expenditures exclude inspection preparation, inspection report writing, and enforcement activities.

During this period in which the staff focused heightened attention on design bases, it identified several safety significant issues. The design-related inspections resulted in the issuance of one Severity Level II enforcement action to D. C. Cook for systemic failure of its design control, surveillance testing, and corrective action programs, and nine Severity Level III enforcement actions (Three Mile Island 1, Vermont Yankee, Indian Point 3, Oyster Creek, H. B. Robinson, Perry, Kewaunee, Point Beach, and Prairie Island). Of all the escalated enforcement actions taken during this period, approximately 13 percent were related to design issues.

Additionally, the increased focus on design bases issues by both the licensees and the NRC resulted in a notable increase in LERs. Those design bases issues reported in 1997-98 have recently been reviewed by the Office of Nuclear Regulatory Research (RES). While there were a number of LERs submitted, only a few design bases issues (three in 1997 and two in 1998 affecting multiple units) reported in the LERs met the Accident Sequence Precursor (ASP) Program guidelines for a significant event (i.e., events with conditional core damage probability 1×10^{-6}). New guidance clarifying what constitutes design bases information in accordance with 10 CFR 50.2 has been developed. In SECY-00-0093, dated April 21, 2000, the staff provided for Commission approval a final rule to modify event reporting requirements for power reactors in 10 CFR 50.72 and 10 CFR 50.73. As a result, it is expected that in the future, there will be fewer LERs associated with design bases issues, but those that remain will be better focused on issues of safety significance.

CONCLUSION:

The design and engineering inspections conducted after licensees responded to the October 9, 1996, 10 CFR 50.54(f) letters determined that, in general, the inspected systems and components were capable of performing their safety functions. However, a substantial number of issues related to compliance with design bases were identified either by licensees or during the NRC inspections, thus resulting in the characterization of a number of plants as being outside the design bases or in an unanalyzed condition. Most of these issues were not individually risk significant because the safety systems, although possibly degraded, were either still capable of performing their intended functions or other diverse systems would have compensated for the impact of the design errors. As stated earlier, several of the identified design issues were of such significance that they met the ASP risk significance threshold or required escalated enforcement actions.

Given the lessons learned from the previously discussed inspection activities, which highlighted the importance of design control, and because performance indicators associated with the ROP do not provide substantive information on design related issues, the staff has included an inspection of safety system design and performance capability at each site in the ROP. This is a team inspection similar in concept to the in-depth inspection of a safety system previously performed as a part of engineering inspections, such as the SSEI and the SSFI. This inspection is currently intended to be performed at each site every 2 years. Periodic and biennial inspections of plant modifications have also been included in the ROP.

The significance determination process developed for the ROP will be used to assess the risk significance of any inspection findings. If the baseline inspection reveals risk-significant design issues, additional inspections will be performed under the

new supplemental inspection program. The ROP will also require the staff to periodically review inspection results and performance indicators and determine if there is a need to revise the frequency and scope of inspections, including the new design inspection. This process will be a part of the staff's ongoing self-assessment activities.

As described in this paper, the staff has completed the followup activities outlined in SECY-97-160 and plans to take no further action related to the review of the 10 CFR 50.54(f) responses on adequacy and availability of design bases information.

It is likely that the number of inspection findings related to design bases and licensee-reported design issues will be less in the future than the past several years, a situation that resulted because of a broad interpretation of what constituted "design bases" information and an increased agency attention in this area. The draft regulatory guide DG-1093, "Guidance and Examples for Identifying 10 CFR 50.2 Design Bases," provides a clear common understanding of what information is considered as design bases to assist both licensees and the staff in bringing a more appropriate safety focus to design bases issues. Also as previously noted, reporting requirements are being revised to eliminate reporting of design deficiencies of minimal significance. The staff believes that the focus by the NRC and licensees on design bases over the last several years, coupled with inclusion of design inspection and plant modification inspection as elements in the baseline inspection program, provide the confidence that licensed facilities will maintain conformance with their design bases. The staff plans to evaluate the results of the initial implementation of the ROP, the experience with the use of regulatory guide DG-1093 (once finalized), and the trend in the licensee event reports following implementation of the revised rule requirements. The staff will incorporate the experience gained into any future revisions to the ROP. At that time the staff will also evaluate whether there is a need for further interactions with the industry on what constitutes design bases information.

COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objections to its content.

The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections.

/RA/

William D. Travers
Executive Director for Operations

CONTACT: S. K. Malur, NRR
301-415-2963