49 FR 45112
Published 11/15/84

10 CFR Part 50

Commission Policy Statement on the Systematic Safety Evaluation of Operating Nuclear Power Reactors

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of Commission Policy Statement.

SUMMARY: This Policy Statement describes a pilot program for which the Commission has developed the regulatory policies and practices to conduct integrated assessments for operating nuclear power reactors. This program is called the Integrated Safety Assessment Program (ISAP) and will address significant regulatory requirements which have evolved since the plant was originally licensed and pending licensing actions which have evolved from a variety of other sources. An integrated assessment will be conducted on a plant-specific basis, as part of a trial program, to evaluate all licensing issues on a given facility and to establish schedules for any necessary plant improvements. In addition, procedures have been established to allow for a periodic updating of the resulting implementation schedules for new licensing issues that arise in the future.

FOR FURTHER INFORMATION CONTACT: Dennis M. Crutchfield, Assistant Director for Safety Assessment, Division of Licensing, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Telephone (301) 492-7492.

SUPPLEMENTARY INFORMATION: In 1977, the Nuclear Regulatory Commission initiated the Systematic Evaluation Program (SEP). Phase I of SEP defined a specific set of safety issues (topics) to be reviewed for operating nuclear power plants. Phase II of SEP was a pilot review of those topics for eleven of the oldest domestic operating reactors. Results have evolved from SEP over the last two years and identified significant experience relative to the safety and evaluation techniques for operating plants.

In 1980, Congress enacted Pub. L. 96-295 (the NRC Authorization Bill for Fiscal Year 1980). Section 110 of Pub. L. 96-295 required that the NRC develop a program for the systematic safety evaluations of operating reactors. The program proposal would have extended SEP to an evaluation which required licensees to compare their plant design to the acceptance criteria in the Standard Review Plan (NUREG-0800).* That program was not implemented for operating reactors; the Commission determined, and the Congress agreed, that the scope of the program was too broad to efficiently evaluate the safety of operating reactors. Congress subsequently specified in later Authorization Bills that funds should not be spent to implement that program. However, those activities were useful in that they focused attention on the needs and difficulties associated with the systematic safety evaluation of operating reactors as they relate to a constantly changing technology and increasing scope of regulatory requirements.

Following the TMI-2 accident, the NRC developed the TMI Action Plan (NUREG-0660)* from the safety lessons learned. Two aspects of the TMI Action Plan are particularly significant to the evaluation of the safety of operating plants: (1) it identified a large number of corrective actions to be implemented by operating plants and (2) it initiated the Interim Reliability Evaluation Program (IREP) in which plant-specific probabilistic risk assessment (PRA) studies were to be performed by the staff for several operating reactors to supplement the risk-reliability experience from the Reactor Safety Study (WASH-1400). The licensing actions resulting from TMI have increased the scope of outstanding licensing issues for all operating plants. Similarly, the experience thus far from IREP indicates that there are plant-specific strengths and weaknesses, from a reliability point of view, that warrant further consideration, beyond the deterministically-based issues.

One of the most significant conclusions drawn from SEP and IREP is that issues related to safety of operating nuclear power plants can be more effectively and efficiently implemented in an integrated, plant-specific review. In addition, the experience from SEP has served to focus on the set of current licensing criteria which should be evaluated for operating plants and experience from IREP has served to define the methods to conduct a plant-specific probabilistic safety analysis so that consistent, comparable results could be obtained which would enhance an integrated plant safety assessment.

Historically, licensing issues have been evaluated generically, and guidelines for any necessary corrective actions have been applied uniformly to all plants. While this approach has provided an effective means to ensure resolution of these issues, the generic implementation has not given sufficient attention to plant-specific characteristics which have a direct bearing on the appropriateness of the corrective action and the relative importance of the issue in relation to an overall plan for any necessary plant improvements. In some cases, consideration of plant-specific characteristics have identified alternative corrective actions which provide an equivalent or greater measure of safety, often at less cost to the licensee.

Consequently, the NRC had developed the regulatory procedures and attendant policies to conduct integrated assessments for operating power reactors. This approach is called the Integrated Safety Assessment Program (ISAP). In order to ensure the effectiveness of this program, it will be started on a trial basis and the plants to be reviewed have been selected by the NRC Staff from those licensees who indicated an interest to voluntarily participate in such a program.

Based on the results of this trial program, the NRC will decide, in about a year, whether or how this program should be extended to other operating reactors.

Implementation Schedules

To provide a stable environment to conduct ISAP, the Commission has authorized the staff to suspend specific existing implementation schedule requirements for the plants to be reviewed. Each affected licensee will be expected to propose and justify deferral

* Copies may be purchased by calling (301) 492-9530 or by writing to the Publications Services Section, Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, or purchased from the National Technical Information Service, Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

for specific implementation requirements that warrant further evaluation. The associated implementation requirements and other safety issues will be evaluated collectively in an integrated assessment. The staff is only authorized to defer substantive regulatory and other requirements to the extent allowed by the Commission's procedural regulations. Thus, the staff will use the provisions in 10 CFR 50.12 to grant any exemptions.

In addition, any new implementation requirements which evolve late in the course of or following ISAP will be deferred for the plants involved and incorporated in an implementation schedule update, as described below.

The only exceptions will be issues for which the NRC Staff explicitly determines that prompt action is required to protect the health and safety of the public. Such actions include the short-term response to bulletins issued by the Office of Inspection and Enforcement.

Scope of Evaluation

The scope of ISAP is intended to be as comprehensive as practical. Consequently, it will consist of deterministic, probabilistic, and operating experience evaluations, which will serve to identify specific issues to be addressed in an integrated assessment.

The deterministic review areas, or ISAP topics, will be derived on a plant-specific basis during a screening review with the licensee at the beginning of the program. The issues to be considered are (1) a set of SEP Topics for which the NRC Staff has found significant differences between current licensing criteria and typical design criteria in existence when operating plants were licensed; (2) all pending licensing actions for the plant, including multi-plant actions, TMI Action Plan requirements and plant-specific licensing actions; (3) the unresolved generic issues for which resolution on a plant-specific basis might be expected, and (4) plant improvements proposed by the licensee.

The Commission's Safety Goal Policy published on March 14, 1983, (48 FR 10772), indicates that the quantitative goals and design objectives will not be used in the licensing process during the evaluation period, nor will the policy be interpreted as requiring that licensees or applicants perform a probabilistic analysis; however, the Commission continues to believe that probabilistic analyses provide a valuable adjunct to the deterministic regulatory requirements and enhance engineering judgments, if they are properly performed and applied. Consequently, the Commission believes that a plant-specific probabilistic safety assessment (PSA) should be performed in conjunction with ISAP. The plant-specific PSA will provide a basis for cost/benefit evaluations for the deterministically-based issues and will also identify potential strengths and weaknesses in the plant design and operation which should be considered in an integrated assessment.

An operating experience evaluation will be conducted in parallel with the topic evaluations and plant-specific PSA. This evaluation will be used to identify issues related to significant trends, event precursors, plant management and operation, and maintenance practices. In addition, the operating experience evaluation will provide a diverse perspective for the integrated assessment. The evaluation will consist of an analysis and categorization of reportable events and forced plant shutdowns and an evaluation of overall licensee performance.

Evaluation Process

The ISAP Topic evaluations and plant-specific PSA will be conducted in parallel. The licensee will initially perform deterministic analyses for the plant-specific set of ISAP Topics by comparing the as-built design of the facility to the current licensing criteria, industry codes and standards, or other appropriate acceptance criteria and also provide risk perspectives for each issue based on the PSA. The staff will review the licensee's analyses and issue safety evaluation reports which identify specific differences from the acceptance criteria and any attendant safety issues which should be considered in the integrated assessment. Schedules for the licensee's analyses and staff evaluation will be established during the screening review to enhance an efficient use of resources.

A PSA would be conducted by the licensee in accordance with an NRC Procedures Guide (NUREG/CR-2815).* The Procedures Guide describes appropriate and consistent methods for (1) initiator definition, (2) application of data, (3) success/failure criteria, (4) analysis, (5) quality control, and (6) documentation and presentation of results. In addition, the NRC Staff will identify methods by which the PSA should address unresolved generic issues; i.e., safety issues for which acceptance criteria do not yet exist. During the screening review, milestones will be established to monitor the progress of the PSA and to ensure appropriate interaction between the NRC Staff and the licensee. The licensee will be expected to use the PSA to identify significant contributors to risk that should be specifically considered in the integrated assessment. For the trial program, the extent and nature of plant-specific probabilistic analyses will be established on a case-by-case basis.

The issues raised in the ISAP Topic evaluations and the PSA, and the operating experience evaluation will be considered collectively in an integrated assessment. Decisions on corrective actions will be based on qualitative assessments of the value and impact of each action. The NRC Staff will present its conclusions regarding the need for or appropriateness of corrective actions proposed by the licensee for each of the identified issues in a draft report. The draft report will be issued for public comment and peer review. Should the NRC Staff and licensee disagree on the corrective action for any issue, that matter will be resolved in accordance with the Commission's procedures for backfitting requirements.

Following resolution of any comments on the draft report, the NRC Staff will request that the licensee establish and justify implementation schedules for each of the corrective actions and any ongoing analyses that may be necessary to establish appropriate corrective actions. The NRC Staff will judge the adequacy of the proposed implementation schedules based on the technical evaluation of the issues presented in the draft report and issue an implementation plan in a final report.

Licensing Action and Schedule Updates

The final report will serve as the basis and documentation for a license amendment incorporating and formalizing the implementation schedules. The license amendment will also establish procedures to periodically update the implementation schedule.

Any new implementation requirements that arise during or following an ISAP review will be deferred, except for those issues for which the NRC Staff determines that prompt action is required to ensure the health and safety or common defense and security of the public.

The deferred implementation requirements will be evaluated collectively as part of an implementation schedule update. The update evaluations would be conducted periodically, but not more than at five-year intervals. The evaluation would follow the same general course as an ISAP review and would consider a revised PSA, which has been updated to reflect corrective actions and plant improvements as they are completed. The revised implementation schedule will similarly be incorporated and formalized by a new license amendment.

Dated at Washington, D.C., this 8th day of November 1984.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.