POLICY ISSUE
(Notation Vote)

August 16, 1991 SECY-91-262

For: The Commissioners

From: James M. Taylor
Executive Director for Operations

Subject: RESOLUTION OF SELECTED TECHNICAL AND SEVERE ACCIDENT ISSUES FOR EVOLUTIONARY LIGHT WATER REACTOR (LWR) DESIGNS

Purpose: To request Commission guidance on the resolution of selected technical and severe accident issues through individual design certifications or generic rulemaking for the evolutionary light water reactor designs. This paper responds to the staff requirements memorandum (SRM) of May 22, 1990, which requested the staff to provide the advantages and disadvantages of proceeding with generic rulemaking on these issues.

Background: On May 18, 1989, Part 52 of Title 10 of the Code of Federal Regulations (10 CFR Part 52) became effective. This rule provides for design certification by rulemaking and, based upon the Commission's Severe Accident Policy Statement, requires applicants to submit a probabilistic risk assessment (PRA), address unresolved and generic safety issues, and demonstrate compliance with technically relevant portions of the Three Mile Island requirements set forth in 10 CFR Part 50.34(f). Section 52.48 also specifies that all certification applications will be judged against technically relevant portions of Parts 20, 50, 73, and 100.

During the past decade, the staff has expended much effort to assess severe accident behavior in the current generation of operating reactors and investigate the appropriate method of incorporating the results of the assessments into the regulatory program.

NOTE: TO BE MADE PUBLICLY AVAILABLE WHEN THE FINAL SRM IS MADE AVAILABLE

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In SECY-88-248, "Implementation of the Severe Accident Policy for Future Light Water Reactors," of September 1988, the staff proposed to implement the Commission's severe accident policy for the evolutionary light water reactors by the promulgation of one or more generic rules and related Regulatory Guides to address the prevention and mitigation of severe accidents for these designs. Subsequently, however, concerns were raised about the effect that generic rulemakings could have on the schedules for the evolutionary LWR design certification proceedings. SECY-88-248 had been withdrawn for revision, and it was decided to defer submitting the revision until after the Commission had approved the design features of the individual evolutionary LWR designs.

In SECY-89-311, "Resolution Process for Severe Accident Issues on Evolutionary Light Water Reactors," of October 10, 1989, it was recommended that the design-specific rulemaking that results from the design certification process of individual applications is a more effective method of resolving severe accident issues than attempting to develop one generic severe accident rule or several individual rulemaking changes for the evolutionary LWRs. In the SRM related to SECY-89-311, the Commission indicated that additional guidance would be provided to the staff following receipt of the staff's paper on where the staff proposed to depart from current regulations (SECY-90-016). In an SRM dated May 22, 1990, the Commission requested the information contained in this paper.

The process to resolve selected technical and policy issues for evolutionary LWRs evolved and was defined in SECYs 89-311, 89-334, 90-065 and 90-146, together with the associated SRMs. Also, the staff developed positions on evolutionary LWR design features and provided these to the Commission in SECYs 89-013, 89-153, and 89-228. This development of staff positions led to SECY-90-016, "Evolutionary Light Water Reactor (LWR) Certification Issues and their Relationship to Current Regulatory Requirements," which incorporated the staff's proposed positions for 15 severe accident and major licensing issues that were extensively discussed with industry, the Advisory Committee for Reactor Safeguards (ACRS), and the Commission. Commission guidance on SECY-90-016 was contained in an SRM dated June 26, 1990.

Discussion: As directed by the Commission, the staff is following the process outlined in SECY-90-065 for the review of evolutionary LWRs. This process ensures that staff recommendations on proposed new requirements resulting from the reviews of evolutionary designs are reviewed by the ACRS and transmitted to the Commission (e.g., SECY-90-016) for review and approval. If approved, these positions are then forwarded to industry for incorporation. This process provides a mechanism for any

new Commission-approved positions to be incorporated into the designs of these plants well before they become formally codified in rulemaking. However, since there is no public participation in this process, the Commission's guidance to industry is only preliminary and does not become final until the certification itself becomes final.

While generic rulemaking for the two evolutionary designs was deferred, work on generic issues has continued. Where appropriate, the staff is already proceeding with rulemaking activities for selected generic issues in parallel with the reviews of these designs. For example, work efforts on the revised source term are nearing completion, and the proposed process for codifying the results of these efforts was outlined in SECY-90-341, "Staff Study on Source Term Update and Decoupling Siting from Design," dated October 4, 1990, and a subsequent followup memorandum from J. Taylor to the Commissioners, dated December 13, 1990. In an SRM dated January 25, 1991, the Commission approved the staff's recommendation to proceed with a single revision to 10 CFR Part 100 in conjunction with an interim revision to 10 CFR Part 50 in order to decouple siting from design while retaining a reference to an in-containment radioactive material release in the regulations. This would maintain the current licensing basis regarding the in-containment release magnitudes until the completion of the research necessary to fully update the regulation. Upon completion of this work, a final revision of Part 50 would be undertaken to add performance requirements to plant design features based on updated source term and severe accident insights, and to replace the dose calculations and related criteria. While these efforts may not be available in time to support either of the evolutionary plant design certifications, they are projected to be available in time to support the passive plant design reviews.

There are several additional areas where the staff is doing work that may provide a source of generic resolutions of issues for severe accidents, and could impact the final revision to Part 50. Most notably, containment performance criteria will be assessed for applicability in addressing severe accidents, particularly in view of the pending update to the source term. As work efforts in these areas progress, generic rulemaking will be recommended by the staff as appropriate, and may be codified in the final revision to Part 50. Resources for these efforts have been included in the draft FY 1992-1996 Five-Year Plan.

The staff is following 10 CFR Part 52 and Commission guidance received to date in reviewing and evaluating issues for the individual evolutionary LWR design certifications. The current course of action for the two evolutionary plant designs is for

the final resolutions of selected technical and severe accident issues, including issues that have been the subject of Commission guidance (e.g., the SRM on SECY-90-016), to be codified in rulemaking as part of the specific design certifications for the GE ABWR and the ABB/CE System 80+. If generic rulemaking were to occur prior to specific design certification rulemaking, the design certification rulemaking would then certify the design against codified standards and could be limited to showing that the proposed design met these standards. This would have some advantages over the current course of action, but the advanced stage of the reviews for the small number and diversity of the designs under consideration (currently just two), together with the potential for delays due to uncertainties in the generic rulemaking process, makes the disadvantages of generic rulemaking prior to the design certification proceedings outweigh the advantages. The discussion outlined below is an extension of that presented in SECY-89-311, and has been updated to reflect the current advanced stage of the evolutionary plant reviews.

Advantages of Generic Rulemaking:

(1) If sufficiently prescriptive, generic rulemaking could reduce litigation in the design certification proceedings by codifying the Commission's policy decisions into enforceable standards. For example, Commission policy decisions relating to the staff recommendations in SECY-90-016 go beyond current NRC requirements. Because 10 CFR Part 52.48 states that standard designs will be reviewed for compliance with relevant portions of Parts 20, 50, 73 and 100, some changes to the requirements of the NRC's regulations will need to be accomplished by rulemaking. Although this can be accomplished in the certification itself, generic rulemaking and review of the standards separate from and prior to the certification hearings could minimize the challenges and potential delays in each design certification hearing.

(2) The public may be better served by the opportunity to participate in the development of standards as early as possible. Early public participation in finalizing these standards could also minimize the perception that in issuing its own guidance (e.g., SECY-90-016), the Commission has pre-judged the certification rulemaking. While this perception may exist, it should be noted that the early guidance of the Commission is only preliminary, and the guidance is subject to change as a result of the certification rulemaking.

(3) Generic rulemaking could facilitate the development of the design certification applications by clarifying and codifying the Commission's requirements as early as possible. This would also serve as a basis for future regulatory positions.

(4) Designers would have greater confidence in submitting their designs for review because they could compare the designs to final standards. This would also minimize the risk that resources would be expended on detailed design efforts that would have to be changed later.

Disadvantages of Generic Rulemaking:

(1) Generic rulemaking could significantly impact current schedules for evolutionary certifications. This is because it may not be feasible to complete a generic rule and the related Regulatory Guides for a specific design prior to the certification proceedings.

(2) Because of the diversity of the designs, it may be difficult to write a generic rule with sufficiently detailed criteria to resolve or materially dispose of the issues. Therefore, a generic rulemaking may provide the regulatory basis for resolving issues, but may not be sufficient to limit the litigation on the implementation of the issues in each design certification hearing. In addition, some aspects of such a rule may not apply to fundamentally different designs.

(3) Generic rulemaking for selected issues is currently scheduled to be completed prior to design certification of the passive designs. Resources to complete this generic rulemaking over a 30-month period are included in the draft FY 1992-1996 Five-Year Plan. If the Commission decides that the generic rulemaking should be completed earlier in order to support design certification of the evolutionary designs, then staff resources (2-3 FTE excluding management time) would need to be reprogrammed for a period of 18 months from other currently planned activities, such as rulemakings for Final Safety Analysis Report (FSAR) updates and criticality alarms.

(4) Resolutions of certain complex issues are interdependent. Efforts on the criteria for a generic rulemaking in one area may affect the staff's proposal for a change in another area. It may be more difficult to resolve these issues on a generic basis than to resolve them in the context of designs, where system characteristics and interdependencies are more defined. For example, the staff may need to complete a rule change on source term in conjunction with a rule change regarding containment performance criteria. In similar fashion, a rule change regarding hydrogen generation and control might be interrelated with any rule change on containment performance criteria. Completing rule changes prior to certification for these and other issues has the potential to be a long and time-consuming process that could delay the staff's reviews of the standardized plants.

Another option to codify selected technical and severe accident issues would be to perform design certification in two parts. Part A could start immediately, and would establish the design-specific technical standards by which each design is to be judged. Part B would be started after completion of the final design review, and would determine the acceptability of the design against the technical standards codified in Part A. This two-step process has the advantages of including the public and codifying standards earlier and separately from the design certification hearings, but has the disadvantage of creating a new process that may be more cumbersome to implement than a single design certification process.

Conclusions:

(1) Although subject to challenges in the design certification proceedings, the Commission's current process and guidance on severe accident and selected design issues is sufficient for the staff's review of these issues for the individual evolutionary plant designs. The process of identifying new regulatory positions to the ACRS for review and transmitting them to the Commission for review and tentative approval based on staff reviews of the designs is expected to continue, allowing decisions on issues to occur as they are needed in the reviews and as sufficient information is available to make those decisions.

(2) Because of the limited number of applications, the diversity of the individual designs, the advanced stage of the reviews, and the potential for delays due to uncertainties in the generic rulemaking process, the usefulness of generic rulemaking to resolve issues in parallel with the review of the individual evolutionary designs is limited. The option of a two step certification process is technically feasible, but would require extra resources and could potentially delay the certification process. Individual design certification rulemakings can provide a timely and effective process that optimizes the staff's resources in codifying the resolution of issues for the ABWR and ABB/CE System 80+ designs.

(3) Generic rulemaking efforts, such as those currently underway for a revised source term, should continue in parallel with the design reviews. Although these efforts may not support either of the evolutionary design certifications, they will be applied to the design review and certification processes where appropriate, including for passive plant designs, as the information becomes available. These

efforts should proceed independently of the design review certification processes in order to optimize the staff's resources and the schedules for these processes.

Recommendations: That the Commission

(1) Approve the staff's plans for proceeding with design-specific rulemakings through individual design certifications to resolve selected technical and severe accident issues for the ABWR and ABB/CE System 80+ designs.

(2) Note the staff's intent to proceed with generic rulemaking where appropriate for evolutionary and passive designs, as information becomes available from ongoing efforts on these issues, independently of the design review and certification processes.

Coordination: The Office of General Counsel has reviewed this paper and has no legal objection to it, but notes that the process of early involvement by the Commission in the resolution of any safety policy questions in the future for the evolutionary designs could be improved if the public were provided with earlier opportunities for informal comment on the issues, even if no early rulemaking is undertaken. Further, OGC notes that the approach to generic rulemaking for passive designs needs to be addressed in the future.

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Commissioners' comments or consent should be provided directly to the Office of the Secretary by COB Tuesday, September 3, 1991.

Commission Staff Office comments, if any, should be submitted to the Cmommissioners NLT Monday, August 26, 1991, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

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