



UNITED STATES
NUCLEAR REGULATORY COMMISSION

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January 16, 1997

52-3

Mr. Nicholas J. Liparulo, Manager
Nuclear Safety and Regulatory Analysis
Nuclear and Advanced Technology Division
Westinghouse Electric Corporation
P.O. Box 355
Pittsburgh, PA 15230

SUBJECT: CRITERIA FOR ESTABLISHING RISK SIGNIFICANT STRUCTURES, SYSTEMS, AND COMPONENTS (SSCs) TO BE CONSIDERED FOR THE AP600 RELIABILITY ASSURANCE PROGRAM

Dear Mr. Liparulo:

The purpose of the design reliability assurance program (D-RAP) is to ensure that reliability is designed into the plant which is consistent with the probabilistic risk assessment (PRA) and to provide confidence that the reliability can be maintained throughout plant life. The specific goal of the D-RAP is to identify "risk significant" SSCs that will be included in the program during the plant design and procurement activities. Ultimately, the designer will develop component maintenance and operational recommendations for the risk significant SSCs identified in the D-RAP that will be passed onto the combined license (COL) applicant. Throughout the life of the plant, the COL holder will be responsible for assuring the validity of the baseline reliability values established by the designer for risk significant SSCs via operational and maintenance activities. The principal program established to monitor SSC reliability for the COL applicant is defined in the maintenance rule (10 CFR 50.65).

SECY-95-132 states that applications for advanced reactor design certifications must contain "... a list of the structures, systems, and components designated as risk significant ...". Although criteria for selecting "risk significant" SSCs are not directly defined in any Nuclear Regulatory Commission (NRC) codes or regulatory guides, the criteria should be consistent with the objective of D-RAP to ensure that the reliability of selected SSCs can be maintained to their designed safety levels once the plant is built and operating. Since a measure of the designed safety level is the magnitude of the plant risk as assessed in the PRA, the criteria for establishing "risk significant" SSCs should ensure that risk will not increase during plant construction and operation and will be consistent with the design certification PRA. The AP600 D-RAP uses probabilistic, deterministic, and other methods to identify risk significant SSCs for inclusion in its program. The probabilistic criteria for selecting risk significant SSCs specify three analytical measures: risk reduction worth, risk achievement worth, and the Fussell-Vesely importance. Westinghouse states that the bases for the probabilistic criteria used in selecting AP600 risk significant SSCs is from precedent set by the evolutionary reactor design certifications which were then modified to take credit for the AP600's lower calculated core damage frequency. The NRC staff, in review of AP600 D-RAP risk significant SSCs

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January 16, 1997

that were derived from the probabilistic criteria, has been unable to reach closure with Westinghouse that the criteria is sufficiently conservative to bound the SSCs that should be considered for the D-RAP.

Upon further review of this issue, the staff notes that the nuclear industry has developed guidelines and criteria used in identifying risk significant SSCs for application of the maintenance rule. This criteria can be found in NUMARC 93-01 which has been endorsed by NRC Regulatory Guide 1.160. Since one of the purposes of the D-RAP is to establish the baseline reliability in both design and performance goals that the COL applicant will ultimately use for the maintenance rule, it is the staff's position that the use of "risk significant" SSCs should be consistent between the two programs. It should also be noted that the NUMARC criteria for risk significant SSCs is the same for all plants regardless of the absolute value of the plant's core damage frequency. The staff recognizes that this position is not entirely consistent with the evolutionary reactor design approvals. However, it is a rational and defensible basis for all future D-RAP reviews.

The staff does not believe that the specification of the NUMARC criteria for risk significant SSCs will impose an unnecessary burden for the AP600 D-RAP. It will only require that the SSCs that are derived from the NUMARC criteria be provided to the D-RAP expert panel. The panel may exclude any SSC from the D-RAP provided it gives a justifiable basis that is documented and auditable.

The staff requests that Westinghouse revise the D-RAP section of the AP600 standard safety analysis report to be consistent with NUMARC 93-01 guidelines for using PRA to identify risk significant SSCs. Subsequent to implementing this revised criteria, Westinghouse should provide to the NRC a list, and the basis for exclusion, of any risk significant SSCs that fall within the NUMARC criteria but have been specifically excluded from the D-RAP based on the judgement of Westinghouse's expert panel.

If you have any questions regarding this matter, you may contact me at (301) 415-1141.

Sincerely,

original signed by:

William C. Huffman, Project Manager
Standardization Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No. 52-003

cc: See next page

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AP600

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