

January 28, 1992

Docket No. 50-605

Mr. Patrick W. Marriott, Manager
Licensing & Consulting Services
GE Nuclear Energy
175 Curtner Avenue
San Jose, California 95125

Dear Mr. Marriott:

SUBJECT: CONTROL ROD DESIGN CRITERIA

Recently the staff identified as a high priority open issue, clarification of the design criteria for the advanced boiling water reactor (ABWR) control rods.

The enclosure to this letter provides comments on the information included in the standard safety analysis report (SSAR) and requests that information be provided to the staff. I request that this enclosure be the basis for a conference call within the next two weeks. Please contact me at (301) 504-1132 to arrange this call.

Sincerely,
original signed by: Rebecca L. Nease
Chester Poslusny, Project Manager
Standardization Project Directorate
Division of Advanced Reactors
and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
ABWR Control Rod
Design Criteria

cc w/enclosure:
See next page

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Mr. Patrick W. Marriott
General Electric Company

Docket No. 50-605

cc: Mr. Robert Mitchell
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ABWR CONTROL ROD DESIGN CRITERIA

The General Criteria described in the SSAR define the design evaluation and functional performance requirements which must be satisfied to provide assurance that the control rods will perform their safety function for the control rod design lifetime. The criteria proposed in Amendment 15, Section 4C, Rev. C, of the SSAR are close to what is needed. However, our review indicates that the following revisions are necessary to achieve fully acceptable criteria.

- a. All reference to approval without USNRC review should be removed. The following changes should be made.
 1. 4C.1 changed to "Control rod ... constitutes the basis for USNRC acceptance and approval of the design."
 2. 4C2.2 changed to "Control rod designs must meet the following acceptance criteria."
- b. Revise 4C2 (1), (2), and (3) as follows:
 1. Add at the end of the sentence, "including irradiation effects for its design lifetime."
 2. Add at the end of the sentence "and throughout its design lifetime."
 3. Add at the end of the sentence "for its design lifetime." In addition, some criteria to qualify the meaning of compatible should be specified either here or in Section 4C3.3; e.g., limitations with respect to cracking, crudding, etc., of the cladding and sheath material should be addressed at least qualitatively.
- c. Add surveillance requirements to 4C.2. If new control rod designs which have not been previously approved by NRC and which do not have demonstrated performance capability for the design lifetime are to be used in ABWR, an additional criterion to address surveillance requirements that will safely verify the design lifetime is needed. The NRC SER on the GE Marathon control rod design may be used for guidance.
- d. Provide Tier 1 design description for the control rods within Tier 1 Section 2.2.2, "Control Rod Drive Design" as given in "Guidelines for Preparation of Inspections, Test, Analyses and Acceptance Criteria (ITAAC)," December 1991, and provide corresponding ITAAC requirements for the control rods. They should address fundamental requirements for the control rods addressed in Chapter 15 of the SSAR such as achievement of necessary scram times and rod drop velocity. The staff will verify that the ITAAC for the fuel and control rod designs have been met prior to authorization to load fuel.