



General Electric Company
175 Curtner Avenue, San Jose, CA 95125

October 8, 1993

Docket No. 52-001

Chet Poslusny, Senior Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of the Nuclear Reactor Regulation

Subject: Submittal Supporting Accelerated ABWR Schedule - **Fuel and Core Designs**

Dear Chet:

Enclosed is a SSAR markup recognizing that each COL applicant may have fuel and core designs different from the ABWR reference core which will be provided by the COL applicant to the USNRC for review and approval.

Please provide a copy of this transmittal to Son Ninh.

Sincerely,

Jack Fox
Advanced Reactor Programs

cc: Alan Beard (GE)
Norman Fletcher (DOE)
Caroline Smith (GE)

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4.2 Fuel System Design

The fuel system is defined as consisting of the fuel assembly and the reactivity control assembly. The fuel assembly is comprised of the fuel bundle, channel and channel fastener. The fuel bundle is comprised of fuel rods, water rods, fuel rods containing burnable neutron absorber, spacers, springs and assembly and fittings.

The fuel to be loaded in an ABWR is any fuel design that is approved by the USNRC or that meets the criteria documented in Appendix 4B. Using these designs will assure that all fuel system design requirements are met.

To demonstrate ABWR system response in this SSAR, a reference core of GEP8x8R fuel is used. This core is shown in Section 4.3; information for this fuel design is provided under Tab AY (ABWR fuel design) of Reference 4.2-1. The compliance of this fuel with the Appendix 4B criteria is documented in Appendix 4D. Each COL applicant ~~referencing the ABWR design~~ may have different fuel and core designs which will be provided by the COL applicant to the USNRC for ~~information~~ *review and approval*.

Regarding the reactivity control system, this Section 4.2 addresses only the reactivity control elements that extend from the coupling interface of the control rod drive mechanism (per Regulatory Guide 1.70). The functional design of the reactivity control system is detailed in Section 4.6.

4.2.1 Design Bases

4.2.1.1 Fuel Assembly

The fuel assembly (comprised of the fuel bundle, channel and channel fastener) is designed to ensure that possible fuel damage would not result in the release of radioactive materials in excess of limits prescribed by 10CFR20, 50 and 100. Evaluations are made in conjunction with the core nuclear characteristics, the core hydraulic characteristics, the plant equipment characteristics, and the instrumentation and protection systems to assure that this requirement is met.

The thermal-mechanical design process emphasizes that:

- (1) The fuel assembly provides substantial fission retention capability during all potential operational modes.
- (2) The fuel assembly provides sufficient structural integrity to prevent operational impairment of any reactor safety equipment.