



General Electric Company
175 Carter Avenue, San Jose, CA 95128

February 10, 1994

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 -
Modification to Subsection 1A.2.16 (TMI ILF.2)

Dear Chet:

Enclosed is the proposed modification to the subject subsection pertaining to the identification of and recovery from conditions leading to inadequate core cooling. The italicized words correspond to the modification.

Please provide a copy of this transmittal to George Thomas.

Sincerely,

Jack Fox
Advanced Reactor Programs

cc: Alan Beard (GE)
Norman Fletcher (DOE)
Joe Quirk (GE)
Craig Sawyer (GE)
Jim Sawabe (GE)

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1A.2.16 Identification of and Recovery from Conditions Leading to Inadequate Core Cooling [ILF.2]

NRC Position

Licensees shall provide a description of any additional instrumentation controls (primary or backup) proposed for the plant to supplement existing instrumentation (including primary coolant saturation monitors) in order to provide an unambiguous, easy-to-interpret indication of inadequate core cooling (ICC). A description of the functional design requirements for the system shall also be included. A description of the procedures to be used with the proposed equipment, the analysis used in developing these procedures, and a schedule for installing the equipment shall be provided.

Response

The direct water level instrumentation provided in the ABWR design is capable of detecting conditions indicative of inadequate core cooling.

The ABWR has two sets of four wide range reactor water level sensing units (eight total) which are used in two separate two-out-of-four logics which initiate ECCS and other safety functions. Each set of four sensors are used in two separate two-out-of-four logics which initiate ECCS operation. Four separate sets of sensing lines, one from each quadrant of the reactor pressure vessel, supply the pressure to the eight sensors for reliability. *This ABWR arrangement of reactor water level sensing complies with the NRC Generic Letter 84-23. The vertical drop inside the drywell of the reactor pressure vessel reference leg water level instrument lines is limited to 0.9 meters (3 feet). Analog level transmitters are employed to monitor the reactor pressure vessel water level. For the safety related functions initiated automatically upon receipt of a reactor pressure vessel water level trip signal, two-out-of-four trip initiation logic is employed, utilizing a signal from a level transmitter in each of the four instrument divisions. This provides high reliability for initiation upon demand, and high tolerance against inadvertent initiation.*

To address the US NRC staff's concern about the potential for reactor pressure vessel water level measurement errors resulting from dissolved non-condensable gasses in the water column in the reactor pressure vessel reference leg water level instrument lines (NRC Generic Letter 92-04 and NRC Information Notice 93-27), the ABWR has implemented continuous purging of the reactor pressure vessel reference leg water level instrument lines. Water is continuously injected into the reactor water level reference leg water level instrument lines by means of the Control Rod Drive (CRD) System. This is shown in Figure 5.1-3 and discussed in Section 7.7.1.1.

Based on the above information, the existing highly redundant direct water level instrumentation already provides an unambiguous, easy to interpret indication of inadequate core cooling, and there are no plans to include *additional instrumentation* in the ABWR design. Subsection 18.8.14 addresses the operator interface for these instruments and controls.