



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

April 27, 1993

Docket No. STN 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 Review Schedule - DFSE  
**Confirmatory Items 7.4.1.1-1 and 7.4.1.1-2**

Dear Chet:

Enclosed is a SSAR markup addressing DFSE Confirmatory Item 7.4.1.1-2.

In reference to Confirmatory Item 7.4.1.1-1, the current ARI design utilizes hard-wired connections between reactor water level 2 and the SSLC. These connections are independent of the RPS/EMS connections. The interconnections between the sensors and the ultimate ARI control actions are currently and adequately discussed in the following sections the SSAR:

- 7.4.1.1 - ARI function - I&C
- 7.4.2.1.2 - Specific Regulatory Requirements Conformance
- 7.7.1.2.2 - Other Electrical System Interfaces
- 7A.2 - Multiplexing Systems  
Responses 5,10,12 and 13
- 7A.7 - Responses to Subsections 7A.5 and 7A.6; Computer  
Hardware and Software  
Items 7A.5(4) and 7A.6(4)

Please provide a copy of this transmittal to Jim Stewart.

Sincerely,

Jack Fox  
Advanced Reactor Programs

cc: Norman Fletcher (DOE)  
Leon Hagopian (GE)  
John Power (GE)

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A PDR

(9) Atmospheric Control (AC) System

- (a) The following AC system equipment functions have transfer and control switches located on both remote shutdown panels as indicated:

- (i) suppression pool temperature (A, B)
- (ii) suppression pool level (A, B)

(10) Makeup Water Condensate System (MUWC)

- (a) The following MUWC system equipment function has transfer and control switches located on the Division II remote shutdown panel as indicated:

- (i) condensate storage pool level (B)

(11) Emergency Diesel Generator (DG) System

- (a) The following DG system equipment functions have transfer and control switches located on corresponding remote shutdown panels as indicated:

- (i) diesel generator run/stop (A)
- (ii) diesel generator run/stop (B)

## 7.4.2 Analysis

### 7.4.2.1 Alternate Rod Insertion Function

#### 7.4.2.1.1 General Functional Requirements Conformance

The alternate rod insertion (ARI) function is accomplished by the rod control and information system (RC&IS) and the fine-motion control rod drive (FMCRD) subsystem. This function provides an alternate method of driving control rods into the core which is diverse from the hydraulic scram system.

The RC&IS and the active run-in function of the FMCRD motors are not required for safety, nor are these components qualified in accordance with safety-related criteria. However, the FMCRD components associated with hydraulic scram are qualified in accordance with safety criteria.

The subsystem's inherent diversity provides mitigation of the consequences of ATWS (anticipated transient without scram) events. This capability is discussed in Subsection 7.7.1.2.2.

#### 7.4.2.1.2 Specific Regulatory Requirements Conformance

Table 7.1-2 identifies the alternate rod insertion (ARI) function and the associated codes and standards applied. In addition to GDCs 13 and 19 (applied to non-safety-related system/functions in accordance with the SRP, Section 7.7), GDC 25 and Reg Guide 1.75 are also addressed relative to the shutdown characteristics of the subsystem and its interface with the essential power buses. The following analysis lists the applicable criteria in order of the listing on the table, and discusses the degree of conformance for each. Any exceptions or clarifications are so noted.

(1) 10CFR50.55a (IEEE 279)

Although the ARI is not Class 1E, the portions of the FMCRD used for the hydraulic scram function are qualified as Class 1E. These functions are analyzed along with the reactor protection (trip) system discussed in Section 7.2.

With regard to IEEE 279, Section 4.7, signals which interface between ARI and RPS are optically isolated such that postulated failures within the ARI controls cannot affect the safety-related scram function.

The RC&IS logic has been designed such that no single failure results in failure to insert more than one operable control rod when the ARI function is activated. Also, two manual actions are required at the dedicated operators panel to manually initiate ARI.

(2) General Design Criteria (GDC)

- (a) Criteria: GDCs 13, 19, and 25.

- (b) Conformance: The ARI is in compliance

4/ The ARI design is in full compliance with the design considerations cited in NEDE-31306-P-A