DRAFT

TRQ - Let's discuss DMC

GE Nuclear Energy

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Docket No. 52-001

52-001

Mr. Dennis M. Crutchfield
Associate Director for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Crutchfield:

Transmitted herewith, in the form of markups to pages of the ABWR Design Control Document (DCD), are ten proposed changes to the ABWR design description which result from information developed in the course of the ABWR First-Of-A-Kind Engineering (FOAKE) program. The need for the proposed changes prior to completion of rulemaking has only recently been determined from an updated analysis of FOAKE detailed design information. Ten copies are enclosed for review by the NRC staff. The background for that analysis and this submittal is set forth below.

GE undertook the ABWR FOAKE activity pursuant to a June 1993 contract with the Advanced Reactor Corporation (ARC) to perform detailed design of the ABWR for its use in the United States. The basic approach of the GE FOAKE activity is to develop the design details of the ABWR consistent with the requirements of the design undergoing NRC certification, a key objective being the development and maintenance of a highly standardized design. This means that the certified design and the FOAKE design must be consistent, with the FOAKE design being much more detailed in its description.

The FOAKE design activity may identify changes which would result in a substantial benefit to safety, reliability or economy. Their consideration, however, is done under an approach which is closely controlled. Any proposed design change to the DCD is processed in accordance with rigorous internal GE review procedures; and proposed changes are only accepted for compelling reasons, in the spirit of maintaining the detailed ABWR design as close as practicable within the boundaries of the DCD. In December of 1995, two design changes were identified that were needed to bring the DCD into compliance with NRC regulations in effect at the time of FDA issuance. In order to take full advantage of the thoroughness of the FOAKE activity, it was then decided to re-evaluate all the FOAKE Engineering Change Authorizations (ECAs) for purposes of determining if any other proposed DCD changes should accompany the two that were initially identified. Enclosed is a summary description of the resulting proposed DCD changes and of the screening criteria used by GE to evaluate whether the FOAKE information requires, or otherwise merits, change to Tier 1 or Tier 2 of the DCD.

Five of the changes proposed herewith are to Tier 1 (and corresponding portions of Tier 2) of the DCD and five are to Tier 2 only. None of the proposed changes are necessary to assure adequate protection of the public health and safety. Rather, as described in the

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enclosure, two are proposed to bring Tier 1 or Tier 2 into compliance with regulations in effect at the time the ABWR FDA was issued, one is proposed to effect a change to technical specifications, four are proposed to make the design described in the DCD functionally operable as intended, and three would effect design improvements which require minor modifications to Tier 1 and which GE thus believes should be incorporated in the DCD at this time.

The FOAKE program has identified a number of additional desirable design improvements; however, the implementing design changes need not be made at this time since they qualify for post-certification §50.59-type change treatment (i.e., they do not affect Tier 1 or Tier 2* or technical specifications, or result in an unreviewed safety question). Those changes will be made in accordance with governing procedures as established by the Commission.

We will, of course, cooperate fully with the staff in completing early review and action of the proposed design changes submitted herewith.

Sincerely yours,

Joseph F. Quirk

cc: (w/0 attachments)

SA Hucik	(GE)
WT Russell	(NRC)
FJ Miraglia	(NRC)
TH Boyce	(NRC)
SM Franks	(DOE)
FA Ross	(DOE)
ND Fletcher	(DOE)
A Machiels	(EPRI)

ABWR Design Change Assessment
Review of FOAKE Design Changes

Change No.	Description	Tier 1 Impact	Screen (Notes)	Remarks
1	Change the Reactor Building and Radwaste Building HVAC Systems to use electric heating in place of hot water heating, split the single intake configuration into three to provide redundancy, and use high efficiency filters in place of medium grade bag-type filters. Use of electric heating will avoid in-service freezing. The change will provide air intake redundancy to satisfy system maintenance needs.	Yes	4	This change addresses a reliability & maintainability issue, rather than a safety concern. The change results in a minor modification to Tier 1, although there is no functional Tier 1 impact.
2	Add an additional chiller/pump set to the Emergency Chilled Water System. This provides functional redundancy to avoid the loss of cooling for the Control and Reactor Building electrical rooms, potentially challenging electrical equipment environmental qualification temperature limits. The added redundancy will also satisfy system maintenance needs.	No	4	The change does not impact Tier 1 because Tier 1 does not specify divisional equipment quantity and logic.
3	Add one smoke removal fan in the bypass duct around exhaust fans in each of the three divisions of the Reactor Building electrical equipment room HVAC. Additionally, for the Control Building HVAC, use two speed fans of adequate capacity in place of existing single speed fans to provide acceptable smoke removal capability for the habitability and safety-related equipment areas. These changes are necessary to comply with the accepted smoke removal method prescribed by the ASHRAE and NFPA standards referenced in the Tier 2.	Yes	3	The change ensures functionality and compliance with Tier 2 commitments.
4	Reassign the Main Control Room exhaust fans "B" as exhaust fans "C," and exhaust fans "C" as exhaust fans "B." This nomenclature change will avoid a potential divisional cross-over of cooling and power.	Yes	4	The change has no safety significance and no impact on the safety functions described in Tier 1. However, it does impact designations on Tier 1 and Tier 2 figures.
5	This change package identifies various Tier 1 and Tier 2 inconsistencies, such as the radiation zone classification of a room shown in the Reactor Building radiation zone maps, Elevation 12300.	Yes	3	Tier 1 and Tier 2 figures and text are modified.

ABWR Design Change Assessment
Review of FOAKE Design Changes

Change No.	Description	Tier 1 Impact	Screen (Notes)	Remarks
6	Provide power for each pair of motor operated isolation dampers in series for the Control Room Habitability Area HVAC System from independent Class 1E division power supplies, instead of powering both dampers from the same source. This will ensure that at least one of two normal inlet or exhaust air isolation dampers in series will close and prevent leakage. Also, the Tier 1 figure is modified to reflect a cross tie on the outside air inlet ducts of the Emergency Filtration Unit. This cross-tie is currently shown in Tier 2 but was not been reflected in the Tier 1 figure.	Yes	1	The change is necessary to ensure compliance with single failure criteria.
7	Delete the rupture disks originally intended to protect the low pressure exhaust side of the RCIC turbine case and exhaust line from overpressurization. Existence of the rupture disks is not consistent with interfacing system LOCA (ISLOCA) requirements. Removal of the rupture disks and upgrading of the associated piping and valves corrects a SSAR inconsistency regarding ISLOCA.	No	3	The change is necessary for conformance to Tier 2 commitments on ISLOCA.
8	Upgrade the FMCRD and scram piping design pressures based on evaluations of water hammer effects. The changes are consistent with the ASME Code which requires use of equipment events rather than plant events in determining the design pressure.	No	1	A change in design pressure is needed due to new design information. The change ensures compliance with ASME Code per 10CFR50.55a.
9	Use a higher strength material for the lower drywell (L/D) access tunnel and RPV pedestal, based on the results of detailed design evaluations. Structural analyses for the L/D access tunnel indicate high thermal stresses which exceed the allowables; these detailed structural evaluations were not performed during the SSAR review stage of the licensing process.	No	3	Based on detailed design evaluations, the materials specified in the DCD are not adequate.
10	Correction of inconsistencies to technical specifications (Chapter 16 and related Tier 2 sections) desired for certification.	No	2	Based on detailed design evaluation and review of technical specifications.

Notes:

Screening Criteria: GE will not propose to change its DCD during the period from FDA issuance to Design Certification unless:

1.) The change corrects an error or deficiency necessary to assure adequate protection to the public health and safety, or to bring the DCD (Tier 1 or Tier 2) into compliance with regulations in effect at the time the ABWR FDA was issued;

2.) The change affects a technical specification;

3.) The change is necessary to make the DCD design functionally operable (as intended); or

4.) The change is a design improvement which GE determines should be incorporated into the design at this time.

All changes which satisfy Criteria 1, 2 or 3 shall be incorporated into the DCD prior to Design Certification. Any Tier 1 or Tier 2 changes which satisfy Criterion 4 should be addressed on a case-by-case basis.