



GE Nuclear Energy

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

August 30, 1994

Docket No. 52-001

Tom Boyce, Senior Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation
Nuclear Regulatory Commission
Washington, DC 20555

Subject: Revision to Draft DCD Introduction for the ABWR

Dear Tom:

As discussed during our meeting on August 23, 1994, General Electric has revised the draft DCD Introduction for the ABWR. We believe this revision incorporates the changes requested by NRC at this meeting. Additionally, this revision includes several editorial changes and several other changes based upon comments received from the industry. To facilitate your review, we are providing a mark-up of the previous version of the DCD Introduction together with a retyped revision.

At the meeting on August 23, 1994, GE and NRC agreed that the severe accident deterministic evaluations in Chapter 19 of the Standard Safety Analysis Report (SSAR) would be retained in the DCD, and that the DCD Introduction would include a statement that such evaluations need not be considered in performing 50.59 evaluations. During a subsequent phone conversation, NRC reversed its position and stated that these deterministic evaluations should be considered in performing 50.59 evaluations. Because GE's previous agreement to include the deterministic evaluations in the DCD was predicated on having an appropriate statement in the DCD Introduction regarding 50.59 evaluations, this statement has been left in the revised draft DCD Introduction. GE would like to discuss this matter further with the NRC to help demonstrate that it is unnecessary and would be inappropriate to consider severe accident deterministic evaluations as part of 50.59 safety evaluations.

Sincerely,

Joseph F. Quirk
Project Manager
ABWR Certification
MC 782, (408) 925-6219

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Introduction for Design Control Document

1.0 Purpose of the DCD

The Design Control Document (DCD) contains information from various documents comprising the design certification application for the Advanced Boiling Water Reactor (ABWR) standard design. The purpose of the DCD is to provide, in a single document, design-related information to be incorporated by reference in the design certification rule for the ABWR standard design.

2.0 Contents of the DCD

This document contains the DCD Introduction, the Certified Design Material (i.e., Tier 1), and the approved safety analysis material (i.e., Tier 2). Each is summarized below.

The Introduction describes the purpose, contents and uses of the DCD.

The Certified Design Material (Tier 1) for the ABWR includes the following information: (1) Definitions and General Provisions; (2) Design Descriptions; (3) Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC); (4) Interface Requirements for interfaces of systems that are wholly or partially outside the scope of the ABWR standard design; and (5) Site Parameters for the ABWR standard design plant. For ease of reference, Tier 1 includes a Table of Contents.

The approved safety analysis material (Tier 2) includes, to the extent applicable for the ABWR standard design, the following information: (1) the information required for a final safety analysis report under 10 CFR 50.34(b); and (2) other relevant information identified in 10 CFR 52.47(a) such as information related to the Three Mile Island requirements under 10 CFR 50.34(f); technical resolutions of the Unresolved Safety Issues and medium and high priority Generic Safety Issues identified in NUREG-0935; and important features identified from the probabilistic risk assessment for the ABWR design. For ease of reference, Tier 2 contains a general Table of Contents at the beginning, as well as a detailed Table of Contents before each chapter.

The Design Descriptions, Interface Requirements, and Site Parameters in Tier 1 are derived entirely from the provisions of Tier 2, but may be more general than the provisions in Tier 2. Therefore, compliance with the more detailed Tier 2 material provides a sufficient method, but not the only acceptable method, for complying with the more general design provisions in Tier 1. The methods specified in Tier 2 shall be followed unless a change is made in accordance with the change processes specified in the design certification rule for the ABWR.

3.0 Uses of the DCD

3.1 In General

The design certification rule for the ABWR can be referenced in an application for a construction permit (CP) or operating license (OL) under 10 CFR Part 50, in a combined license (COL) under 10 CFR Part 52, and in the subsequently issued CP, OL, or COL. Because the DCD is incorporated by reference in the design certification rule for the ABWR, the provisions of the DCD are effective with respect to an application, permit, or license that references that rule, with certain exceptions as provided in the rule and described in Sections 3.2, 3.3 and 3.4 below.

The DCD describes structures, systems, and components (including any associated programmatic provisions) within the scope of the ABWR standard design, and the requirements governing the interfaces between the ABWR standard design and the plant-specific design. An application for a CP, OL, or COL that references the design certification rule for the ABWR must provide a plant-specific safety analysis report (SAR) which shall incorporate by reference the DCD and include information about the part of the plant that is outside the scope of the ABWR standard design. Together, the DCD and plant-specific SAR will provide the technically relevant information required for a CP, OL, or COL, or to an application for a CP, OL, or COL that references the design certification rule for the ABWR.

3.2 Uses of the Certified Design Material

The following provisions describe the scope and uses of Tier 1 material:

- Design Descriptions - The Design Descriptions pertain only to the design of structures, systems, and components of an ABWR standard plant and not to its operation, maintenance and administration. In the event of an inconsistency between the Design Descriptions and the Tier 2 material, the Design Descriptions shall govern.
- ITAAC - An applicant or holder of a COL shall perform and demonstrate conformance with the ITAAC prior to fuel load. An applicant for a COL may proceed at its own risk with design and procurement activities, and a holder of a COL may proceed at its own risk with design, procurement, construction and preoperational activities, even though the NRC staff may not yet have agreed that any particular ITAAC have been satisfied. In the event of a noncompliance with an ITAAC, the applicant or holder of a COL shall either take corrective actions to successfully complete the ITAAC or request a change in the ITAAC in accordance with the change processes specified in the design certification rule for the ABWR.

- Interface Requirements - The Interface Requirements identify the criteria for interfaces between systems within the scope of the ABWR standard design and other systems that are wholly or partially outside the scope of the ABWR standard design. The Interface Requirements define the attributes and performance characteristics that the out-of-scope portion of the plant must have in order to support the certified design. The plant-specific SAR shall contain provisions which implement the Interface Requirements in accordance with 10CFR 52.79(b). Additionally, the plant-specific application for COL shall contain additional ITAAC corresponding to these implementing provisions. In the event of an inconsistency between the Interface Requirements and the Tier 2 material, the Interface Requirements shall govern.
- Site Parameters - The Site Parameters identify the design values for site-related information used for the ABWR standard design plant. Detailed design activities for structures, systems, and components within the scope of the ABWR standard design shall be performed with reference to the Site Parameters. For cases where a site-specific characteristic is not bounded by a Site Parameter, the CP, OL or COL applicant either shall submit an analysis to demonstrate that the overall set of site characteristics do not exceed the capability of the ABWR standard design, or shall request a change in the Site Parameters in accordance with the change processes in the design certification rule for the ABWR. Design activities for structures, systems, and components outside the scope of the ABWR standard design may be performed using site-specific design basis parameters. In the event of an inconsistency between the Site Parameters and the Tier 2 material, the Site Parameters shall govern.

3.3 Uses of the Approved Safety Analysis Material

The following provisions describe the scope and uses of Tier 2 material:

- Effect of Tier 2 - All of the information in Tier 2 is approved by the NRC, is applicable (except as described below with respect to COL License Information Items and Conceptual Designs) to a license application or license that references the ABWR design certification rule, and is among the "matters resolved" under 10 CFR 52.63(a)(4). Compliance with Tier 2 material is a sufficient but not a necessary method for complying with Tier 1 material. The methods specified in Tier 2 shall be followed unless a change is made in accordance with the change processes specified in the design certification rule for the ABWR.
- COL License Information Items - Tier 2 identifies certain matters that need to be addressed by an applicant or licensee that references the design certification for the ABWR. These matters are designated as "COL License Information."

The purpose of the COL License Information items is to identify the type of information that must be addressed in plant-specific SARs that reference the design certification rule for the ABWR. These COL License Information items do not establish requirements; rather they identify an acceptable set of information, but not the only acceptable set of information, for inclusion in a plant-specific SAR. An applicant may deviate from or omit these COL License Information items, provided that the deviation or omission is identified and justified in the plant-specific SAR. After issuance of a license, the COL License Information items have no further effect to that licensee; instead, the corresponding provisions in the plant-specific SAR are applicable.

- Conceptual Designs - Conceptual designs for those portions of the plant which are outside the scope of the ABWR standard design are described in various places throughout Tier 2. As provided by 10 CFR 52.47(a)(1)(ix), these conceptual designs are not a part of the design certification for the ABWR and are not applicable to a CP, OL, or COL, nor to an application for a CP, OL, or COL, that references the design certification rule for the ABWR.

3.4 Applicability of the DCD

The provisions in the DCD are applicable to plants having applications, permits, or licenses that reference the design certification rule for the ABWR, except as described in the following sections.

3.4.1 Applicability of ITAAC

The ITAAC are applicable to applications and licenses that reference the design certification rule for the ABWR, except as follows:

- The ITAAC are not applicable to a CP or OL that references the design certification rule, nor to an application for a CP or OL under Part 50.
- The ITAAC are not applicable to a COL after the NRC has issued its finding in accordance with 10CFR 52.99 and 52.103(g) prior to operation of the facility. Thereafter, the ITAAC cease to have any regulatory significance.

3.5 Plant-Specific Changes to Certain Designated Material in Tier 2

Certain information within sections of Tier 2 identified in Table 1 is designated with brackets, italicized text, and an asterisk. Changes to any of this designated information shall constitute an unreviewed safety question. As specified in the design certification rule for the ABWR, NRC approval is required prior to implementing plant-specific changes that involve unreviewed safety questions.

3.6 Proprietary Information

The proprietary information, or its equivalent, provided in the application for the ABWR Design Certification, but not included in the DCD, must be included as part of an application for a CP, OL, or COL.

3.7 References in Tier 2 to the Standard Safety Analysis Report

To enable Tier 2 to have the same section numbering system as the Standard Safety Analysis Report (SSAR) for the ABWR, the SSAR section numbers were used in preparing Tier 2. In some instances, sections or information from the SSAR were deliberately not incorporated in the DCD. Tier 2 references or cross-references to sections in the SSAR shall not be construed as incorporating these sections, or the information therein, in Tier 2.

3.8 Chapter 19 of Tier 2

Chapter 19 of Tier 2 contains deterministic severe accident analyses for the ABWR standard design that were used and approved by the NRC as part of its safety review to evaluate ABWR performance under severe accident conditions. Design requirements relating to severe accident features are contained elsewhere in the DCD and are subject to the change processes specified in the design certification rule for the ABWR. For the purpose of evaluating whether a change involves an unreviewed safety question pursuant to those change processes, deterministic severe accident analyses described in Chapter 19 of Tier 2 need not be considered.

Table 1 Designated Tier 2 Material Which May Not be Changed Without Prior NRC Approval

Tier 2 Section	Designated Material
3.8.1.1.1	ASME Boiler and Pressure Vessel Code, Section III, Division 2, Subsection CC/ACI 359
3.8.3.2	ANSI/AISC N-690 and ACI 349
3.9.6.2.2	Motor-Operated Valves
3.10	Equipment Seismic Qualification Methods
3.9.1.7	Piping Design Acceptance Criteria
4.2	Fuel System: Design Criteria and First Cycle Design and Methods
7A.1 (1)	EMS Performance Specifications and Architecture
7.1.1.2	Self-test System Design Testing Features and Commitments
7.1.2.10.9	Instrument Setpoint Methodology; Regulatory Guide 1.105
7A.1 (2)	SSLC Hardware and Software Qualification
18E.1	HFE Design and Implementation Process

Introduction for Design Control Document

1.0 Purpose of the DCD

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2.0 Contents of the DCD

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The Introduction describes the purpose, contents and uses of the DCD.

The Certified Design Material (Tier 1) for the ABWR includes the following information: (1) Definitions and General Provisions; (2) Design Descriptions; (3) Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC); (4) Interface Requirements for interfaces of systems that are wholly or partially outside the scope of the ABWR standard design; and (5) Site Parameters for the ABWR standard design plant.

The Approved Safety Analysis Material (Tier 2) includes, to the extent applicable for the ABWR standard design, the following information: (1) the information required for a final safety analysis report under 10 CFR 50.34(b); (2) information related to the Three Mile Island requirements under 10 CFR 50.34 (f); (3) technical resolutions of the Unresolved Safety Issues and medium and high priority Generic Safety Issues identified in NUREG-0933; and (4) important features identified from the probabilistic risk assessment for the ABWR design and a description of design features for preventing and mitigating severe accidents. For ease of reference, Tier 2 contains a general Table of Contents at the beginning, as well as a detailed Table of Contents before each chapter.

and (2) other relevant information identified in 10 CFR 50.47(a) such as

INSERT A

The Design Descriptions, Interface Requirements, and Site Parameters in Tier 1 are derived entirely from the provisions of Tier 2, but may be more general than the provisions in Tier 2. Therefore, compliance with the more detailed Tier 2 material provides a sufficient method, but not the only acceptable method, for complying with the more general design provisions in Tier 1. For ease of reference, Tier 1 includes not only the Table of Contents, but a List of Figures and a List of Tables as well.

INSERT A

The methods specified in Tier 2 shall be followed unless a change is made in accordance with the change processes specified in the design certification rule for the ABWR.

3.0 Uses of the DCD

3.1 In General

The design certification rule for the ABWR can be referenced in a construction permit (CP) or operating license (OL) under 10 CFR Part 50, in a combined license (COL) under 10 CFR Part 52, ~~or in an application for a CP, OL, or COL.~~ Because the DCD is incorporated by reference in the design certification rule for the ABWR, the provisions of the DCD are effective with respect to an application, permit, or license that references that rule, with certain exceptions as provided in the rule and described in Sections 3.2, 3.3 and 3.4 below.

The DCD ~~applies only to~~ ^{describes} structures, systems, and components within the scope of the ABWR standard design, and ~~to~~ the requirements governing the interfaces between the ABWR standard design and the plant-specific design. An application for a CP, OL, or COL that references the design certification rule for the ABWR must provide a plant-specific safety analysis report (SAR) which shall incorporate by reference the DCD and include information about the part of the plant that is outside the scope of the ABWR standard design. Together, the DCD and plant-specific SAR ~~(and plant-specific~~

~~complementary ITAAC as noted in Section 3.2)~~ ^(including any associated programmatic provisions) will provide the design provisions ~~applicable to~~ a CP, OL, or COL, or to an application for a CP, OL, or COL that references the design certification rule for the ABWR.

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3.2 Uses of the Certified Design Material

The following provisions describe the scope and uses of Tier 1 material:

- Design Descriptions - The Design Descriptions pertain only to the design of structures, systems, and components of an ABWR standard plant and not to its operation, maintenance and administration. ~~The same process applicable to the operability of Part 50 plants (e.g., technical specifications) will be used to develop operability requirements for structures, systems, and components.~~

^{an inconsistency} In the event of a discrepancy between the Design Descriptions and the Tier 2 material, the Design Descriptions shall govern.

- ITAAC - An applicant or holder of a COL shall perform and demonstrate conformance with the ITAAC prior to fuel load. An applicant for a COL may proceed at its own risk with design and procurement activities, and a holder of a COL may proceed at its own risk with design, procurement, construction and preoperational activities, even though the NRC staff may not yet have agreed that all ITAAC have been satisfied. In the event of a noncompliance with an ITAAC, the applicant or holder of a COL ~~may~~ ^{shall} take corrective actions to successfully complete the ITAAC ^{or request a change in the} ITAAC in accordance with the change processes specified in the design certification rule for the ABWR.

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either

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- Interface Requirements - The Interface Requirements identify the criteria for interfaces between systems within the scope of the ABWR standard design and other systems that are wholly or partially outside the scope of the ABWR standard design. The plant-specific SAR shall contain provisions which implement the Interface Requirements in accordance with 10CFR 52.79(f). Additionally, the plant-specific application for COL shall contain ITAAC corresponding to these implementing provisions. In the event of an inconsistency between the Interface Requirements and the Tier 2 material, the Interface Requirements shall govern. additional
 - Site Parameters - The Site Parameters identify the ~~set of~~ ^{INSERT C} site-related information used for the ABWR standard design plant. ~~The plant-specific SAR shall demonstrate that the site-specific design basis parameters are bounded by the Site Parameters.~~ Detailed design activities for structures, systems, and components within the scope of the ABWR standard design shall be performed using the Site Parameters. Design activities for structures, systems, and components outside the scope of the ABWR standard design may be performed using site-specific design basis parameters. In the event of an inconsistency between the Site Parameters and the Tier 2 material, the Site Parameters shall govern. design values for
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3.3 Uses of the Approved Safety Analysis Material

The following provisions describe the scope and uses of Tier 2 material:

- Effect of Tier 2 - All of the information in Tier 2 is approved by the NRC, is applicable (except as described below with respect to COL License Information Items and Conceptual Designs) to a license application or license that references the ABWR design certification rule, and is ~~one of the~~ ^{among} "matters resolved" under 10 CFR 52.63(a)(4). Compliance with Tier 2 material is a sufficient but not a necessary method for complying with Tier 1 material. INSERT A
- COL License Information Items - Tier 2 identifies certain matters ^{that need} to be addressed by an applicant or licensee that references the design certification for the ABWR. These matters are designated as "COL License Information."

The purpose of the COL License Information items is to identify the type of information that ~~should be provided~~ ^{must be addressed} in plant-specific SARs that reference the ~~DCD. These items are in the nature of guidance to a referencing applicant or licensee.~~ These COL License Information items do not establish requirements; rather they identify an acceptable set of information, but not the only acceptable set of information, for inclusion in a plant-specific SAR. An applicant may deviate from these COL License Information items, provided that the deviation is identified in the plant-specific SAR. After issuance of a license, the COL

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The Interface Requirements define the attributes and performance characteristics that the out-of-scope portion of the plant must have in order to support the Certified Design.

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For cases where a site-specific characteristic is not bounded by a Site Parameter, the CP, OL or COL applicant either shall submit an analysis to demonstrate that the overall set of site characteristics do not exceed the capability of the ABWR standard design, or shall request a change in the Site Parameters in accordance with the change processes in the design certification rule for the ABWR.

License Information items have no further effect to that licensee; instead, the corresponding provisions in the plant-specific SAR are applicable.

- Conceptual Designs - Conceptual designs for those portions of the plant which are outside the scope of the ABWR standard design are described in various places throughout Tier 2. As provided by 10 CFR 52.47(a)(1)(ix), these conceptual designs are not a part of the design certification for the ABWR and are not applicable to a CP, OL, or COL, nor to an application for a CP, OL, or COL, that references the ~~BCD~~ design certification rule for the ABWR.

3.4 Applicability of the DCD

The provisions in the DCD are applicable to plants having applications, permits, or licenses that reference the ~~BCD~~ design certification rule for the ABWR, except as described in the following sections.

3.4.1 Applicability of ITAAC

The ITAAC are applicable to applications and licenses that reference the design certification rule for the ABWR, except as follows:

- The ITAAC are not applicable to a CP or OL that references the design certification rule, nor to an application for a CP or OL under Part 50.
- The ITAAC are not applicable to a COL after the NRC has authorized fuel load ^{52.103(g)} prior to operation of the facility. Thereafter,

3.5 Plant-Specific Changes to Certain Designated Material in Tier 2

^{INSERT D} As discussed in the design certification rule, an applicant or licensee must obtain NRC approval prior to implementing changes to certain plant-specific material in Tier 2. This specific material is designated in Table 1.

3.6 Proprietary Information

The proprietary information or its equivalent provided in the application for the ABWR Design Certification but not included in the DCD must be submitted as part of an application for a CP, OL, or COL. ⁱⁿ ~~submitted~~ ^{included} ~~included~~ ^{INSERT E}

INSERT D

Certain information within sections of Tier 2 identified in Table 1 is designated with brackets, italicized text, and an asterisk. Changes to any this designated information shall constitute an unreviewed safety question. As specified in the design certification rule for the ABWR, NRC approval is required prior to implementing plant-specific changes that involve unreviewed safety questions.

INSERT E

3.7 References in Tier 2 to the Standard Safety Analysis Report

To enable Tier 2 to have the same section numbering system as the Standard Safety Analysis Report (SSAR) for the ABWR, the SSAR section numbers were used in preparing Tier 2. In some instances, sections or information from the SSAR were deliberately not incorporated in the DCD. Tier 2 references or cross-references to sections in the SSAR shall not be construed as incorporating these sections, or the information therein, in Tier 2.

3.8 Chapter 19 of Tier 2

Chapter 19 of Tier 2 contains deterministic severe accident analyses for the ABWR standard design that were used and approved by the NRC as part of its safety review to evaluate ABWR performance under severe accident conditions. Design requirements relating to severe accident features are contained elsewhere in the DCD and are subject to the change processes specified in the design certification rule for the ABWR. For the purpose of evaluating whether a change involves an unreviewed safety question pursuant to those change processes, deterministic severe accident analyses described in Chapter 19 of Tier 2 need not be considered.