19A Response to CP/ML Rule 10 CFR 50.34(f)

The information in this appendix of the reference ABWR DCD, including all subsections and tables, is incorporated by reference with the following departure and supplements.

STD DEP T1 2.14-1 (Table 19A-1)

19A.2 NRC Positions/Responses

19A.2.12 Evaluation of Alternative Hydrogen Control Systems [Item (1) (xii)]

STD DEP T1 2.14-1

NRC Position

Perform an evaluation of alternative hydrogen control systems that would satisfy the requirements of paragraph (f)(2)(ix) of 10 CFR 50.34(f). As a minimum include consideration of a hydrogen ignition and post-accident inerting system. The evaluation shall include:

(1) A comparison of costs and benefits of the alternative systems considered.

(2) For the selected system, analyses and test data to verify compliance with the requirements of (f)(2)(ix) of 10 CFR 50.34.

(3) For the selected system, preliminary design descriptions of equipment, function, and layout.

Response

The ABWR primary containment is inerted and is, therefore, protected from hydrogen combustion regardless of the amount or rate of hydrogen generation. In fact, increasing amounts of hydrogen moves the primary containment oxygen concentration further from the flammable regime. ~~The ABWR is also provided with permanently installed recombiners which prevent the buildup of oxygen, due to radiolysis, from creating a potentially flammable mixture.~~ Radiolysis is the only potential source of oxygen in the ABWR primary containment.

See Subsection 6.2.7.1 for COL license information pertaining to alternate hydrogen control. The deletion of the Flammability Control system, including the recombiners, from the STP 3 & 4 design, and the design's capability to accommodate oxygen from radiolysis, is described in Subsection 6.2.5.

19A.2.21 Hydrogen Control System Preliminary Design [item (2) (ix)]

STD DEP T1 2.14-1

NRC Position

Provide a system for hydrogen control that can safely accommodate hydrogen generated by the equivalent of a 100% fuel-clad metal-water reaction. Preliminary

design information on the tentatively preferred system option of those being evaluated in paragraph (1) (xii) of 10 CFR 50.34(f) is sufficient at the construction permit stage. The hydrogen control system and associated systems shall provide, with reasonable assurance, that: [II.B.8]

(1) Uniformly distributed hydrogen concentrations in the containment do not exceed 10% during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100% fuel clad metal-water reaction, or that the post-accident atmosphere will not support hydrogen combustion.

(2) Combustible concentrations of hydrogen will not collect in areas where unintended combustion or detonation could cause loss of containment integrity or loss of appropriate mitigating features.

(3) Equipment necessary for achieving and maintaining safe shutdown of the plant and maintaining containment integrity will perform its safety function during and after being exposed to the environmental conditions attendant with the release of hydrogen generated by the equivalent of a 100% fuel-clad metal water reaction including the environmental conditions created by activation of the hydrogen control system.

(4) If the method chosen for hydrogen control is a post-accident inerting system, inadvertent actuation of the system can be safely accommodated during plant operation.

Response

Per the response to Item (1)(xii), refer to Subsection 6.2.5 for a detailed description of the inerting ~~and recombiner~~ system~~s~~.

19A.2.46 Dedicated Penetration [Item (3) (vi)]

STD DEP T1 2.14-1

NRC Position

For plant designs with external hydrogen recombiners, provide redundant dedicated containment penetrations so that, assuming a single failure, the recombiner systems can be connected to the containment atmosphere. [II.E.4.1]

Response

This item is ~~addressed in Subsection 1A.2.13~~ <u>not applicable to the ABWR design.</u>

19A.3 COL License Information

19A.3.1 Long Term Training Upgrade

The following site-specific supplement addresses COL License Information Item 19.20.

STP 3&4 will include simulation facilities in accordance with 10 CFR 55.46 requirements for operator testing and licensing. Operator training is described in Sections 18.8.8 and 13.2.

19A.3.2 Long-Term Program of Upgrading of Procedures

The following site-specific supplement addresses COL License Information Item 19.21.

Section 13.5 describes a long-term program of upgrading procedures, beginning during construction and follows into operation, for integrating and expanding efforts to improve plant procedures. The scope of the program includes emergency procedures, reliability analysis, human factors engineering, crisis management, operator training, and important industry and operation and experience.

19A.3.3 Purge System Reliability

The following site-specific supplement addresses COL License Information Item 19.22.

A testing program to ensure that the large ventilation valves close within the limits assured in the radiologic design bases is described in Section 3.9 and 6.6.9.1.

19A.3.4 Licensing Emergency Support Facility

The following site-specific supplement addresses COL License Information Item 19.23.

A comprehensive site Emergency Plan including a description of the Emergency Operations Facility for STP is provided as Part 5 of this application.

19A.3.5 In-Plant Radiation Monitoring

The following site-specific supplement addresses COL License Information Item 19.24.

Personal monitoring and portable instrumentation of in-plant radiation and airborne radioactivity as well as training and procedures appropriate for a broad range of routine and accident conditions is provided in Sections 12.5.2, 12.5.3.1, and 12.3.5.2.

19A.3.6 Feedback of Operating, Design and Construction Experience

The following site-specific supplement addresses COL License Information Item 19.25.

Administrative procedures for evaluating operating, design and construction experience are included in STP 3&4 Project documents including, Engineering Technical Specifications, U7-PROJ-G-SPEC-ETS-0001, and Utility Requirements Document Requirements, U7-PROJ-G-RPT-URD-0001 to ensure ~~and for ensuring~~ that applicable important industry experiences ~~shall be~~are provided in a timely manner to those designing and constructing the ABWR Standard Plant. (Subsection 19A.2.41).

Operator experience will be incorporated into training and procedures prior to fuel load as described Sections 13.2.3 and 13.5.3, respectively. (COM 19A-1).

19A.3.7 Organization and Staffing to Oversee Design and Construction

The following site-specific supplement addresses COL License Information Item 19.26.

A description of organization and staff is provided in Section 13.1.

19A.3.8 Develop More Detailed QA Criteria

The following site-specific supplement addresses COL License Information Item 19.27.

The QA program description has been submitted as a separate document titled “STP Units 3 & 4 Quality Assurance Program Description.”

Table 19A-1 ABWR-CP/ML Rule Cross Reference (Continued)

CP/ML Rule Section	Item Action Plan	Appendix Section	Title	Tier 2 Reference
~~(vi)~~	~~II.E.4.1~~	~~19A.2.46~~	~~Dedicated Penetration~~	~~Subsection 1A.2.13~~