

### 3I Equipment Qualification Environmental Design Criteria

The information in this section of the reference ABWR DCD, including all subsections, tables, and figures, is incorporated by reference with the following departures.

STD DEP T1 2.14-1 (Table 3I-13)

~~STD DEP 3I-1~~

STD DEP 3I-2 (Tables ~~3I-3 and~~ 3I-17)

STD DEP Admin

~~The Hydrogen Recombiner deletion was provided in ABWR Licensing Topical Report NEDE 33330-P "Advanced Boiling Water Reactor (ABWR) Hydrogen Recombiner Requirements Elimination.," dated May 2007. Page C-21 of this LTR is incorporated by reference.~~

#### ~~STD DEP 3I-1, Environmental Qualification Conditions (Containment Spray)~~

~~The environmental qualification requirements for equipment located in the upper and lower drywell areas include the potential for wetting and submergence based on use of the containment cooling (spray) mode of the RHR system. Equipment located in the lower drywell must be qualified for submergence based on the ability to flood the lower drywell in event of a severe accident scenario. The design of the upper drywell includes provisions to prevent submergence in this area, but the equipment must be capable of performing the respective safety functions before, during, and after the initiation of the containment cooling (spray) mode of the RHR system. Equipment located in the lower drywell must be qualified for submergence based on the ability to flood the lower drywell in event of a severe accident scenario. The design of the upper drywell includes provisions to prevent submergence in this area, but the equipment must be capable of performing the respective safety functions before, during, and after the initiation of the containment spray function. The density change and duration more accurately reflects the design parameters for containment spray operation in a post-LOCA environment, and still results in the equipment located in the upper drywell being completely wetted. Thus, there is no decrease in the capability of equipment located in the upper drywell to perform their respective safety functions.~~

~~This departure has been evaluated and determined to comply with the requirements in 10 CFR 52, Appendix A, Section VIII.B.5, as described previously. The change does not affect any safety or design function.~~

#### ~~3I.3.2.3 Water Quality and Submergence~~

~~STD DEP 3I-1~~

~~A 1600 micrometer particle (maximum diameter) sized containment spray with a flow density of (approximately) 1.0 ~~0.4~~ liter/s per square meter may be initiated at ten ~~30~~ minutes following a loss of coolant accident (LOCA) signal and continuing operated continuously for up to ~~100~~ ~~3~~ days, for areas inside primary containment vessel (drywell and wetwell). The plant design includes provisions for drainage to prevent submergence of essential equipment in the upper drywell during spray operation. Essential equipment located in the lower drywell will be qualified for submergence.~~

### 3I.3.3 COL License Information

The following site-specific supplement addresses COL License Information Item 3.43.

The radiation environment conditions given in Tables 3I-7 through 3I-11 and Tables 3I-16 through ~~3-19~~ 3I-19 will be revised as necessary based upon as-designed and as-procured equipment. These tables in the FSAR will be updated as necessary in accordance with 10 CFR 50.71(e).

**Table 3I-3 Thermodynamic Environment Conditions Inside Reactor Building (Secondary Containment) Plant Normal Operating Conditions**

Plant Zone/Typical Equipment	Pressure <sup>1</sup> kPaG	Temperature °C	Relative-Humidity
General floor-area (not otherwise noted)/Similar-Equipment	0	Max 40 Min 10	Max 90 Min 10
RHR pump rooms [Figs. 1.2-4/5.4-10]	0	Max 40 <sup>2</sup> Min 10	Max 90 Min 10
RCIC pump room [Figs. 1.2-4/5.4-8]	0	Max 40 Min 10	Max 90 Min 10
HPCF pump rooms [Figs. 1.2-4/6.3-7]	0	Max 40 Min 10	Max 90 Min 10
FPC pump room [Figs. 1.2-9/9.1-1]	0	Max 40 Min 10	Max 90 Min 10
SGTS rooms [Figs. 1.2-10/6.5-1]	0	Max 40 Min 10	Max 90 Min 10
MS tunnel room [Figs. 1.2-8/5.1-3]	0	Max 60 Min 10	Max 90 Min 10
Divisional valve rooms [Figs. 1.2-8/EGCS]	0	Max 60 Min 10	Max 90 Min 10
Instrument rack rooms [Figs. 1.2-6/EGCS]	0	Max 40 Min 10	Max 90 Min 10
CUW heat exchanger rooms (Figs. 1.2-4 and 5.4-12)	0	Max 50 Min 10	Max 90 Min 10

1. The indicated (positive or negative) pressure will be maintained. Pressure difference will not be controlled.
2. During pump operation (test running, etc.) this temperature will be a Max. 66°C. The frequency of this maximum temperature occurrence is assumed 2 hours/month (test) or 90 days/year in RHR room (abnormal) and 2 hours/month in the other rooms.

**Table 3I-13 Thermodynamic Environment Conditions Inside Reactor Building  
(Secondary Containment) Plant Accident Conditions<sup>1</sup> (Continued)**

Plant Zone/Typical Equipment		Time <sup>2</sup>			
		1 (h)	6 (h)	12 (h)	100 (day)
<i>FCS<sup>6</sup> valves including</i>	<i>Temperature (°C)</i>	<i>120</i>	<i>120</i>	<i>66</i>	<i>66</i>
<i>Isolation valve (recombiner</i>	<i>Pressure (kPaG)</i>	<i>102.97<sup>3</sup></i>	<i>102.97<sup>3</sup></i>	<i>3.43</i>	<i>0</i>
<i>instrument, controls), electrical</i>	<i>Humidity (%)</i>	<i>Steam</i>	<i>Steam</i>	<i>100</i>	<i>90-max</i>
<i>equipment (power source-</i>					
<i>cables)[Figs. 1.2-8/6.2-40]</i>					

**Table 3I-17 Radiation Environment Conditions Inside Reactor Building  
Design Basis Accident (Secondary Containment)**

Plant Zone/Typical Equipment	Accident	LOCA Dose Rate		Integrated Dose <sup>1</sup>	
		Gamma (Gy/h)	Beta (Gy/h)	Gamma (Gy)	Beta (Gy)
General floor area [Fig. 1.2-4]	15.6.5	8E-2	2E+0	2E+1	3E+2
RHR room [Figs. 1.2-4/5.4-10]	15.6.5	2E+3	1E+5	6E+5	8E+7
RCIC room [Figs. 1.2-4/5.4-8]	15.6.2	7E-2	1E+0	9E-1	3E+1
HPCF room [Figs. 1.2-4/6.3-7]	15.6.5	1E+3	6E+4	4E+5	5E+7
SGTS room [Figs. 1.2-10/6.5-1]	15.6.5	2E+4	2E+0	3E+7	3E+2
MS tunnel [Figs. 1.2-8/5.1-3]	15.6.4	9E-1	7E+0	<del>2E+0</del> 4E+1	<del>9E+0</del> 2E+6
Divisional valve room [Figs 1.2-5/ECCS]	15.6.5	2E+3	2E+5	8E+5	2E+8
Instrument rack room [Figs. 1.2-6/ECCS]	15.6.5	3E-2	2E+0	<del>5E+0</del> 5E+0	<del>5E+2</del> 5E+2

1. Integration dose is summed over a six month period for Accident Case 15.6.5, 6 hours for 15.6.2, and 2 hours for 15.6.4.

