From: "Lindgren, Donald A." <lindg1da@westinghouse.com>
To: "'jnw@nrc.gov'" <jnw@nrc.gov>, Lauren Quinones <LNQ@nrc.gov>
Date: Thu, Oct 27, 2005 1:16 PM
Subject: 2.3.7 changes

Attached is a file including the changes we agreed to on the spent fuel pool Tier 1 and Tier 2 information.

Don Lindgren

CC: "Cummins, Ed" <cumminwe@westinghouse.com>, "Vijuk, Ronald P." <vijukrp@westinghouse.com>, "Winters, James W." <winterjw@westinghouse.com>, "Condrac, Robert F." <condrarf@westinghouse.com>, "Wiseman, Dale A." <wisemada@westinghouse.com>

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From: "Lindgren, Donald A." <lindg1da@westinghouse.com>

Created By: lindg1da@westinghouse.com

Recipients
nrc.gov
owf4_po.OWFN_DO
JNW (Jerry Wilson)
LNQ (Lauren Quinones)

westinghouse.com
wisemada CC (Dale A. Wiseman)
condrarf CC (Robert F. Condrac)
winterjw CC (James W. Winters)
vijukrp CC (Ronald P. Vijuk)
cumminwe CC (Ed Cummins)

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Tier 1 Subsection 2.3.7, and Tables 2.3.7-1, 2.3.7-2, 2.3.7-3, and 2.3.7-4

Tier 2 Subsection 9.1.3.4.3

Spent Fuel Pool Cooling System

Description of Change

Correct and clarify the Tier 1 information for the spent fuel pool cooling system. Also provide precise references for ITAAC items.

Technical Justification

Change Table 2.3.7-4, Items 6.b), 7.a), and 7.b) to provide a direct reference to the relevant material.

Standardize the descriptive terms for "components" versus "equipment" and for "pipes" versus "lines" versus "piping," throughout the ITAAC to be component(s) and pipeline(s), respectively.

Table 2.3.7-4, Item 7.b) Design Commitment: revise the ITAAC Commitment statement to state that "The SFS provides spent fuel cooling for 7 days by boiling the spent fuel pool water and makeup water from on-site water storage tanks." The makeup water addition function is performed by the PCS, and ITAAC 2.2.2 provides the required inspection and acceptance criteria.

Table 2.3.7-4, Item 7.b), v **and vi:** revise the Inspections, Tests, and Analyses entry and the Acceptance Criteria entry to **refer to Table 2.2.2-3.** ~~state, "See Tier 1 Material subsection 2.2.2 for inspection, testing, and acceptance criteria for the SFS makeup water supply from the passive containment cooling system (PCS) ancillary water storage tank to the spent fuel pool."~~ The makeup water addition function is performed by the PCS, and ITAAC 2.2.2 provides the required inspections, tests, and acceptance criteria.

Regulatory Consequence

There is no change to design function. There is no change to safety analyses or analysis methodology. This change will not affect the FSER.

Change Markup

Revise Tier 1 subsection 2.3.7 under "Design Description" as follows:

2.3.7 Spent Fuel Pool Cooling System

Design Description

The spent fuel pool cooling system (SFS) removes decay heat **from spent fuel** ~~from~~ **by transferring heat from** the water in the spent fuel pool ~~and transfers the heat~~ to the component cooling water system during normal modes of operation. The SFS purifies the water in the spent fuel pool, fuel transfer canal, and in-containment refueling water storage tank during normal modes of operation. **Following events such as earthquakes, or fires, if the normal heat removal method is not available, decay heat is removed from spent fuel by boiling water in the pool. In the event of long-term station blackout, makeup water is supplied to the spent fuel pool from onsite storage tanks.**

The SFS is as shown in Figure 2.3.7-1 and the component locations of the SFS are as shown in Table 2.3.7-5.

1. The functional arrangement of the SFS is as described in the Design Description of this Section 2.3.7.

2. a) The components identified in Table 2.3.7-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping **lines** identified in Table 2.3.7-2 as ASME Code Section III ~~is~~**are** designed and constructed in accordance with ASME Code Section III requirements.

3. Pressure boundary welds in piping **lines** identified in Table 2.3.7-2 as ASME Code Section III meet ASME Code Section III requirements.

4. The piping **lines** identified in Table 2.3.7-2 as ASME Code Section III retains ~~its~~**their** pressure boundary integrity at its design pressure.

5. The seismic Category I ~~equipment~~ **components** identified in Table 2.3.7-1 can withstand seismic design basis loads without loss of safety function.

6. a) The Class 1E components identified in Table 2.3.7-1 are powered from their respective Class 1E division.

   b) Separation is provided between SFS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

7. The SFS **performs**~~rovides~~ the following safety-related functions:

   a) The SFS preserves containment integrity by isolati**ng**~~ion of~~ the SFS **piping** lines penetrating the containment.

   b) The SFS provides spent fuel cooling for 7 days by boiling ~~water in~~ the **spent fuel** pool **water** and ~~providing~~ makeup water from on-site water storage tanks.

   c) Check valves in the drain line from the refueling cavity prevent flooding of the refueling cavity during containment flooding.

8. The SFS provides the nonsafety-related function of removing spent fuel decay heat using pumped flow through a heat exchanger.

9. Safety-related displays identified in Table 2.3.7-1 can be retrieved in the main control room (MCR).

10. Controls exist in the MCR to cause the pumps identified in Table 2.3.7-3 to perform their listed functions.

11. Displays of the SFS parameters identified in Table 2.3.7-3 can be retrieved in the MCR.

Tier 1 Table 2.3.7-1 Revise the title of the first column and change the second entry on the second page of Tier 1 Table 2.3.7-1 as follows:

Table 2.3.7-1									
Component~~Equipment~~ Name	**Tag No.**	**ASME Code Section III**	**Seismic Cat 1**	**Remotely Operated Valve**	**Class 1E/ Qual for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**

Note: Dash (-) indicates not applicable.

Table 2.3.7-1 (cont.)									
Component~~Equipment~~ Name	**Tag No.**	**ASME Code Section III**	**Seismic Cat 1**	**Remotely Operated Valve**	**Class 1E/ Qual for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
SFS **Pump** Discharge Line to Cask Loading Pit Isolation Valve	SFS-PL-V045	Yes	Yes	No	-/-	No	-	-	-

Note: Dash (-) indicates not applicable.

Tier 1 Table 2.3.7-2 Revise the title of the first column and revise the 11th entry in Tier 1 Table 2.3.7-2 as follows:

Table 2.3.7-2		
Piping Line Name	**Line Number**	**ASME Code Section III**
Cask Pit Transfer Branch Line	L045	Yes

Tier 1 Table 2.3.7-3 Revise the title of the first column in Tier 1 Table 2.3.7-3 as follows:

Table 2.3.7-3			
~~Equipment~~ Component Name	**Tag No.**	**Display**	**Control Function**
SFS Pump 1A	SFS-MP-01A	Yes (Run Status)	Start
SFS Pump 1B	SFS-MP-01B	Yes (Run Status)	Start
SFS Flow Sensor	SFS-13A	Yes	-
SFS Flow Sensor	SFS-13B	Yes	-
Spent Fuel Pool Temperature Sensor	SFS-018	Yes	-
Cask Loading Pit Level Sensor	SFS-022	Yes	-

Note: Dash (-) indicates not applicable.

Tier 1 Table 2.3.7-4 Revise Items 2.b), 3, 4, 5, 6.b, 7.a, and 7.b) of Tier 1 Table 2.3.7-4 as follows:

Table 2.3.7-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.b) The piping **lines** identified in Table 2.3.7-2 as ASME Code Section III **are**~~is~~ designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping **lines** as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping **lines** identified in Table 2.3.7-2 as ASME Code Section III.
3. Pressure boundary welds in piping **lines** identified in Table 2.3.7-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
4. The piping **lines** identified in Table 2.3.7-2 as ASME Code Section III retain~~s~~ **their**~~its~~ pressure boundary integrity at its design pressure.	A hydrostatic test will be performed on the piping **lines** required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the piping **lines** identified in Table 2.3.7-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.

Table 2.3.7-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5. The seismic Category I ~~equipment~~ **components** identified in Table 2.3.7-1 can withstand seismic design basis loads without loss of safety functions.	i) Inspection will be performed to verify that the seismic Category I ~~equipment~~ **components** identified in Table 2.3.7-1 ~~is~~**are** located on the Nuclear Island.	i) The seismic Category I ~~equipment~~ **components** identified in Table 2.3.7-1 ~~is~~**are** located on the Nuclear Island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
	iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	iii) A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions.

Table 2.3.7-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.b) Separation is provided between SFS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Tier 1 Material, **Table 3.3-6, item 7.d.** ~~Section 3.3, Nuclear Island Buildings~~	See Tier 1 Material, **Table 3.3-6, item 7.d.** ~~Section 3.3, Nuclear Island Buildings~~
7.a) The SFS preserves containment integrity by isolation of the SFS lines penetrating the containment.	See Tier 1 Material, **Table 2.2.1-3, Items 1 and 7**~~subsection 2.2.1, Containment System.~~	See Tier 1 Material, **Table 2.2.1-3, Items 1 and 7**~~subsection 2.2.1, Containment System.~~
7.b) The SFS provides spent fuel cooling for 7 days by boiling **the spent fuel** pool water ~~in the pool~~ and ~~providing~~ makeup water from on-site storage tanks.	i) Inspection will be performed to verify that the spent fuel pool includes a sufficient volume of water.	i) The volume of the spent fuel pool and fuel transfer canal above the fuel and to the elevation 6 feet below the operating deck is greater than or equal to 46,700 gallons.
	ii) Inspection will be performed to verify the cask washdown pit includes sufficient volume of water.	ii) The **water** volume of the cask washdown pit is greater than or equal to 30,900 gallons.
	iii) A safety-related flow path exists from the cask washdown pit to the spent fuel pool.	iii) See item 1 of this table.
	iv) See Tier 1 Material **Table 2.2.2-3, item 7.f.** ~~subsection 2.2.2~~ for inspection, testing, and acceptance criteria for the makeup water supply ~~line~~ from the passive containment cooling system (PCS) water storage tank to the spent fuel pool.	iv) See Tier 1 Material **Table 2.2.2-3, item 7.f.** ~~subsection 2.2.2~~ for inspection, testing, and acceptance criteria for the makeup water supply ~~line~~ from the PCS water storage tank to the spent fuel pool.
	v) Inspection will be performed to verify that the passive containment cooling system water storage tank includes a sufficient volume of water.	v) **See Tier 1 Material Table 2.2.2-3, item 7.f) for** ~~T~~the volume of the passive containment cooling system water storage tank ~~is greater than or equal to 756,700 gallons~~.
	vi) **See Tier 1 Material Table** ~~subsection~~ **2.2.2-3 Items 8.a., and 8.b. for inspection, testing, and acceptance criteria** ~~for the SFS makeup water supply from the PCS Inspection will be performed~~ to verify that the passive containment cooling system ancillary water storage tank includes a sufficient volume of water.	vi) **See Tier 1 Material Table** ~~subsection~~ **2.2.2-3 Items 8.a., and 8.b. for inspection, testing, and acceptance criteria for the** ~~SFS makeup water supply from the PCS The~~ volume of the passive containment cooling system ancillary water storage tank. ~~is greater than or equal to 175,000 gallons~~

Revise the second paragraph of Tier 2 subsection 9.1.3.4.3 as follows:

In the unlikely event of an extended loss of normal spent fuel pool cooling, ~~the water in the pool will begin to boil and~~ the water level will drop. Low spent fuel pool level alarms in the control room will indicate to the operator the need to initiate makeup water to the pool. These alarms are provided from safety-related level instrumentation in the spent fuel pool. With the use of makeup water, the pool level is maintained above the spent fuel assemblies for at least 7 days. Initial spent fuel pool water level is controlled by technical specifications. During the first 72 hours any required makeup water is supplied from safety related sources. If makeup water beyond the safety related sources is required between 72 hours and 7 days, water from the passive containment cooling system ancillary water storage tank is provided to the spent fuel pool. The amount of makeup required to provide the 7 day capability depends on the decay heat level of the fuel in the spent fuel pool and is provided as follows: