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April 3, 2011

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF12080

Subject: **MHI's Response to US-APWR DCD RAI No. 896-6269 Revision 3 (SRP 03.09.06)**

Reference: 1) "Request for Additional Information No. 896-6269 Revision 3, SRP Section: 03.09.06 – Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints – Application Section: 3.9.6" dated January 30, 2012.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 896-6269 Revision 3"

Enclosed is the response to the RAI contained within Reference 1.

Please contact Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittals. His contact information is provided below.

Sincerely,

Yoshiki Ogata,
Director- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosures:

1. Response to Request for Additional Information No. 896-6269 Revision 3

D081
NRO

CC: J. A. Ciocco
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Docket No. 52-021
MHI Ref: UAP-HF-12080

Enclosure 1

UAP-HF-12080
Docket No. 52-021

Response to Request for Additional Information No. 896-6269
Revision 3

April 2012

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

4/3/2012

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**896-6269 Revision 3**
SRP SECTION:	**03.09.06 - Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints**
APPLICATION SECTION:	**DCD SECTIONS 3.9.6**
DATE OF RAI ISSUE:	**1/30/2012**

Question No. : 03.09.06-69

US-APWR Design Control Document (DCD) Tier 1 includes Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for safety-related valves that address their design-basis capability. However, US-APWR DCD Tier 1 does not appear to include ITAAC to verify the functional design and qualification for all safety-related pumps and valves to be capable of performing their intended function for the full range of operating conditions up to design-basis conditions. For such ITAAC, the Design Commitment column should specify that pumps and valves identified in the applicable Tier 1 table will be functionally designed and qualified such that each pump and valve is capable of performing its intended function for a full range of system differential pressure and flow, ambient temperatures, and available voltage (as applicable) under conditions ranging from normal operating to design-basis accident conditions. The Inspections, Tests, and Analyses column should specify that tests or type tests of the pumps and valves listed in the applicable Tier 1 table will be conducted to demonstrate that the pumps and valves function under conditions ranging from normal operating conditions to design-basis accident conditions. The Acceptance Criteria column should specify that a test report exists and concludes that the pumps and valves listed in the applicable Tier 1 table function under conditions ranging from normal operating conditions to design-basis accident conditions. The NRC staff requests that the US-APWR design certification applicant revise the applicable sections of US-APWR DCD Tier 1 to specify ITAAC to verify the functional design and qualification of all safety-related pumps and valves to perform their intended function for a full range of operating conditions up to design-basis conditions.

ANSWER:

Safety-related active mechanical equipment "functional design and qualification" is performed in accordance with DCD Tier 2 Section 3.9.6 and the US-APWR equipment qualification program described in DCD Section 3.11 and Technical Report MUAP-08015. An equipment qualification data summary report documents the qualification data package that assures that safety-related pumps and valves are capable of performing their intended function for the full range of operating conditions up to design-basis conditions.

SRP 14.3 and its subsections, such as SRP 14.3.3, provide ITAAC guidance regarding fluid systems, including pumps and valves in those systems. SRP 14.3.3 provides topical guidance for writing ITAAC to verify the functional design and qualification of valves.

VALVES

SRP 14.3.3 says that for MOV and other valves an inspection will be performed to verify design qualification and states that for "MOVs in particular" an inspection will be performed to "verify the records of vendor tests that demonstrate MOV ability to function under design conditions." SRP 14.3.3 also states that ITAAC should be created for in-situ testing of installed MOVs, POVs and check valves to verify whether they can perform intended functions under preoperational test conditions.

DCD Tier 1 ITAAC verify the ability of specified safety-related valves to perform their design basis safety functions in accordance with SRP 14.3 and SRP 14.3.3 guidance. MOV represent a special class of valves for ITAAC purposes. Using Emergency Core Cooling System (ECCS) Tier 1 Table 2.4.4-5 as an example, SRP 14.3 guidance to "verify the records of vendor tests that demonstrate MOV ability to function under design conditions" is satisfied (ITAAC ITA and AC 9.a.i and 9.a.iii). ITAAC are also provided to verify in-situ valve testing (ITAAC#9.a.ii and 9.a.iv) as stated in SRP 14.3.3 and SRP 14.3 Appendix D. These ITAAC verify principal performance characteristics and safety features of as-built ECCS valves listed in DCD Tier 1 Table 2.4.4-2. This is similarly true for the following Tier 1 ITAAC:

Table 2.4.2-5 ITAAC#10.a, 12.a
Table 2.4.4-5 ITAAC#9.a
Table 2.4.5-5 ITAAC#8.e, 10.a
Table 2.4.6-5 ITAAC#10.a
Table 2.7.1.2-5 ITAAC#9.a, 13.a, 14
Table 2.7.1.9-5 ITAAC#8.c, 9.a
Table 2.7.1.10-4 ITAAC#14
Table 2.7.1.11-5 ITAAC#9.a
Table 2.7.3.1-5 ITAAC#9.a
Table 2.7.3.3-5 ITAAC#9.a
Table 2.7.3.5-5 ITAAC#9.a
Table 2.7.6.7-5 ITAAC#9
Table 2.11.2-2 ITAAC#12.a
Table 2.11.3-5 ITAAC#9.a

Thus, US-APWR DCD Tier 1 ITAAC are appropriately selected and written to verify principal performance characteristics and safety features for valves in accordance with SRP 14.3 guidance and no ITAAC change is required for this purpose.

PUMPS

Existing Tier 1 ITAAC for as-built pumps are intended to include verifying vendor records for pump functional design and qualification. However, to assure clarity, DCD Tier 1 is changed to separate the vendor test record inspection from as-built pump functional verification ITAAC and a new ITAAC is added to each applicable DCD Tier 1 section to verify vendor test records. This change affects DCD Tier 1 Sections 2.4.4, 2.4.5, 2.4.6, 2.6.4, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, and 2.11.3. The form of the new ITAAC is as follows:

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
X. The pumps identified in Table Y perform their safety functions under its design conditions.	X.i Type tests or a combination of type tests and analyses of each pump identified in Table Y will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	X.i An equipment qualification data summary report exists and concludes that pumps identified in Table Y perform their safety functions under design conditions.
	X.ii Inspections will be performed of the as-built pumps identified in Table Y.	X.ii Each as-built pump identified in Table Y is bounded by the type tests, or a combination of type tests and analyses.

Note: Underlined values X and Y will be replaced with numbers that are consistent with each applicable ITAAC table numbering.

Impact on DCD

US-APWR DCD Revision 3 Tier 1 Sections 2.4.4, 2.4.5, 2.4.6, 2.6.4, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, and 2.11.3, are changed as described in the answer above and shown on the attached markups. (See Attachment-1.)

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

7.b The ECCS provides RCS makeup, boration, and safety injection during design basis events.

7.c The ECCS provides pH adjustment of water flooding the containment following design basis accidents.

7.d The safety injection pumps have sufficient net positive suction head (NPSH).

8. Controls are provided in the MCR to open and close the remotely operated valves identified in Table 2.4.4-2.

9.a The motor-operated, air-operated and check valves, identified in Table 2.4.4-2 as having an active safety function, perform an active safety function to change position as indicated in the table.

9.b After loss of motive power, the remotely operated valves, identified in Table 2.4.4-2, assume the indicated loss of motive power position.

10.a Controls are provided in the MCR to start and stop the safety injection pumps identified in Table 2.4.4-4.

10.b The pumps identified in Table 2.4.4-4 start after receiving an ECCS actuation signal.

10.c A confirmatory-open interlock is provided to automatically open the accumulator discharge valve upon the receipt of an ECCS actuation signal or an above low pressurizer pressure (P11) setpoint signal.

11. Alarms and displays identified in Table 2.4.4-4 are provided in the MCR.

12. Alarms, displays and controls identified in Table 2.4.4-4 are provided in the RSC.

13. The piping identified in Table 2.4.4-3 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.

14.a Deleted.

14.b Deleted.

15. The pumps identified in Table 2.4.4-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.4.4.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.4-5 describes the ITAAC for the ECCS.

The ITAAC associated with the ECCS equipment, components, and piping that comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.4.4-5 Emergency Core Cooling System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 10 of 10)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
14.a Deleted.	14.a Deleted.	14.a Deleted.
14.b Deleted.	14.b Deleted.	14.b Deleted.
15. The pumps identified in Table 2.4.4-2 perform their safety functions under design conditions.	15. Type tests or a combination of type tests and analyses of each pump identified in Table 2.4.4-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	15. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.4.4-2 perform their safety functions under design conditions.

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10.a The motor-operated and check valves identified in Table 2.4.5-2 as having an active safety function perform an active safety function to change position as indicated in the table.

10.b After loss of motive power, the remotely operated valves, identified in Table 2.4.5-2, assume the indicated loss of motive power position.

11. Controls are provided in the MCR to start and stop the CS/RHR pumps identified in Table 2.4.5-4.

12. Alarms and displays identified in Table 2.4.5-4 are provided in the MCR.

13. Alarms, displays and controls identified in Table 2.4.5-4 are provided in the RSC.

14. The piping identified in Table 2.4.5-3 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.

15.a Deleted

15.b Deleted

16. The pumps identified in Table 2.4.5-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.4.5.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.5-5 describes the ITAAC for the RHRS. The ITAAC associated with those components shared with the CSS performing their containment spray functions are provided in Subsection 2.11.3.

The ITAAC associated with the RHRS equipment, components, and piping that comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.4.5-5 Residual Heat Removal System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 9 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
14. The piping identified in Table 2.4.5-3 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.	14. Inspections of the as-built piping identified in Table 2.4.5-3 will be performed based on the evaluation report for LBB or for the evaluation of the protection from dynamic effects of a pipe break, as specified in Section 2.3.	14. An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built piping identified in Table 2.4.5-3 and piping materials, or a pipe break hazards analysis report exists and concludes that protection from the dynamic effects of a line break is provided.
15.a Deleted.	15.a Deleted.	15.a Deleted.
15.b Deleted.	15.b Deleted.	15.b Deleted.
16. The pumps identified in Table 2.4.5-2 perform their safety functions under design conditions.	16. Type tests or a combination of type tests and analyses of each pump identified in Table 2.4.5-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	16. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.4.5-2 perform their safety functions under design conditions.

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14.a Deleted.

14.b Deleted.

15. The pumps identified in Table 2.4.6-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.4.6.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.6-5 describes the ITAAC for the CVCS.

The ITAAC associated with the CVCS equipment, components, and piping that comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.4.6-5 Chemical and Volume Control System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 7 of 7)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
14.a Deleted.	14.a Deleted.	14.a Deleted.
14.b Deleted.	14.b Deleted.	14.b Deleted.
15. The pumps identified in Table 2.4.6-2 perform their safety functions under design conditions.	15. Type tests or a combination of type tests and analyses of each pump identified in Table 2.4.6-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	15. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.4.6-2 perform their safety functions under design conditions.

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26.a.i The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

26.a.ii The ASME Code Section III components of the EPS support systems, identified in Table 2.6.4-2, are reconciled with the design requirements.

26.b.i The ASME Code Section III piping of the EPS support systems, including supports, identified in Table 2.6.4-2, is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

26.b.ii The ASME Code Section III piping of the of the EPS support systems, including supports, identified in Table 2.6.4-2, is reconciled with the design requirements.

27.a Pressure boundary welds in ASME Code Section III components, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds.

27.b Pressure boundary welds in ASME Code Section III piping, identified in Table 2.6.4-2, meet ASME Code Section III requirements for non-destructive examination of welds.

28. Deleted.

29. Each fuel oil storage tank provides a seven day supply of fuel oil to its respective Class 1E EPS while operating at rated load.

30. Each Class 1E EPS lubrication system lubricating oil tank provides a seven day supply of lubrication oil ~~to its respective Class 1E EPS~~. DCD_14.03.06-26

31. Each main shaft driven lubrication oil pump circulates lubrication oil to the engine during EPS operation.

32. Each division of the Class 1E EPS combustion air intake and exhaust system is capable of supplying combustion air to the EPS and of disposing exhaust gases of the EPS when operating at 110% of nameplate rating.

33. The pumps identified in Table 2.6.4-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.6.4.3 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.4-1 describes the ITAAC for the Class 1E EPS and the FOS systems.

Table 2.6.4-1 EPS Systems Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 10 of 10)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	30.ii Inspection will be performed to verify that the as-built Class 1E EPS lubrication system lubricating oil tank volume bounds the analyses.	30.ii The as-built Class 1E EPS lubrication system lubricating oil tank volume bounds the analyses.
31. Each main shaft driven lubrication oil pump circulates lubrication oil to the engine during EPS operation.	31. Inspection of each as-built main shaft driven lubrication oil pump will be performed.	31. Each as-built main shaft driven lubrication oil pump is designed to circulate lubrication oil to the engine during EPS operation.
32. Each division of the Class 1E EPS combustion air intake and exhaust system is capable of supplying combustion air to the EPS and of disposing exhaust gases of the EPS when operating at 110% of name plate rating.	32. A test of each division of the as-built Class 1E EPS at 110% of name plate rating will be performed.	32. Each division of the as-built Class 1E EPS combustion air intake and exhaust system is capable of supplying combustion air to the EPS and of disposing exhaust gases of the EPS when operating at 110% of name plate rating.
33. The pumps identified in Table 2.6.4-2 perform their safety functions under design conditions.	33. Type tests or a combination of type tests and analyses of each pump identified in Table 2.6.4-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	33. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.6.4-2 perform their safety functions under design conditions.

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9.b After loss of motive power, the remotely operated valves, identified in Table 2.7.1.11-2, assume the indicated loss of motive power position.

10. Alarms and displays identified in Table 2.7.1.11-4 are provided in the MCR.

11. Alarms, displays and controls identified in Table 2.7.1.11-4 are provided in the RSC.

12. Each EFW pump delivers at least the minimum flow required for removal of core decay heat using the SGs against a SG pressure up to the set pressure of the first stage of main steam safety valve plus 3 percent.

13. The EFWS has the capability to permit operation at hot shutdown for eight hours followed by six hours of cooldown to the initiation temperature of the residual heat removal system.

14. The EFW pumps have sufficient net positive suction head (NPSH).

15. The EFW control valves limit maximum flow to each SG to less than the EFW pump design value.

16. Deleted.

17. The pumps identified in Table 2.7.1.11-2 as having PSMS control perform an active safety function after receiving a signal from PSMS.

18. Controls are provided in the MCR to start and stop the EFW pumps identified in Table 2.7.1.11-4.

19. The pumps identified in Table 2.7.1.11-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.7.1.11.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.1.11-5 describes the ITAAC for the EFWS.

The ITAAC associated with the EFWS equipment, components, and piping that comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.7.1.11-5 Emergency Feedwater System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 9 of 9)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
18. Controls are provided in the MCR to start and stop the EFW pumps identified in Table 2.7.1.11-4.	18. Tests will be performed on the as-built EFW pumps identified in Table 2.7.1.11-4 using controls in the as-built MCR.	18. Controls in the as-built MCR start and stop the as-built EFW pumps identified in Table 2.7.1.11-4.
19. The pumps identified in Table 2.7.1.11-2 perform their safety functions under design conditions.	19. Type tests or a combination of type tests and analyses of each pump identified in Table 2.7.1.11-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	19. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.7.1.11-2 perform their safety functions under design conditions.

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15. The pumps identified in Table 2.7.3.1-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.7.3.1.2 Inspections, Tests, Analysis, and Acceptance Criteria

Table 2.7.3.1-5 describes the ITAAC for the ESWS.

Table 2.7.3.1-5 Essential Service Water System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 7 of 7)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13.a Controls are provided in the MCR to place in service or remove from service the strainers identified in Table 2.7.3.1-4.	13.a Tests will be performed on the as-built strainers identified in Table 2.7.3.1-4 using controls in the as-built MCR.	13.a Controls are provided in the as-built MCR to place in service or remove from service the as-built strainers identified in Table 2.7.3.1-4.
13.b The strainers identified in Table 2.7.3.1-2 as having PSMS control perform an active safety function after receiving a signal from PSMS.	13.b Tests will be performed on the as-built strainers identified in Table 2.7.3.1-2 as having PSMS control using simulated signals.	13.b The as-built strainers identified in Table 2.7.3.1-2 as having PSMS control perform the active safety function identified in the table after receiving a simulated signal.
14. The ESWP discharge strainer backwash isolation valves identified in Table 2.7.3.1-2 as having PSMS control perform an active safety function after receiving a signal from PSMS.	14. A test will be performed on the as-built ESWP discharge strainer backwash isolation valves identified in Table 2.7.3.1-2 as having PSMS control using simulated signals.	14. The as-built ESWP discharge strainer backwash isolation valves identified in Table 2.7.3.1-2 as having PSMS control perform the active safety function identified in the table after receiving a simulated signal.
15. The pumps identified in Table 2.7.3.1-2 perform their safety functions under design conditions.	15. Type tests or a combination of type tests and analyses of each pump identified in Table 2.7.3.1-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	15. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.7.3.1-2 perform their safety functions under design conditions.

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10.a Controls are provided in the MCR to start and stop the CCW pumps identified in Table 2.7.3.3-4.

10.b The pumps identified in Table 2.7.3.3-2 as having PSMS control perform an active safety function after receiving a signal from PSMS.

11. Alarms and displays identified in Table 2.7.3.3-4 are provided in the MCR.

12. Alarms, displays and controls identified in Table 2.7.3.3-4 are provided in the RSC.

13. The CCW pumps have sufficient net positive suction head (NPSH).

14. The pumps identified in Table 2.7.3.3-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.7.3.3.2 Inspections, Tests, Analysis, and Acceptance Criteria

Table 2.7.3.3-5 describes the ITAAC for the CCWS.

The ITAAC associated with the CCWS equipment, components, and piping that comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.7.3.3-5 Component Cooling Water System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 8 of 8)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13. The CCW pumps have sufficient net positive suction head (NPSH).	13. Tests to measure the as-built CCW pump suction pressure will be performed. Inspections and analyses to determine NPSH available to each pump will be performed. The analysis will consider vendor test results of required NPSH and the effects of: – pressure losses for pump inlet piping and components, – suction from the CCW surge tank with operating pressure and water level at their minimum values.	13. A report exists and concludes that the NPSH available exceeds the required NPSH.
14. The pumps identified in Table 2.7.3.3-2 perform their safety functions under design conditions.	14. Type tests or a combination of type tests and analyses of each pump identified in Table 2.7.3.3-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	14. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.7.3.3-2 perform their safety functions under design conditions.

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14. The ECW compression tank volume accommodates system thermal expansion and contraction, and 7-day system operation without make-up.

15. The pumps identified in Table 2.7.3.5-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.7.3.5.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.3.5-5 describes the ITAAC for the ECWS.

Table 2.7.3.5-5 Essential Chilled Water System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 7 of 7)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13. The ECW pumps have sufficient net positive suction head (NPSH).	13. Tests to measure the as-built ECW pump suction pressure will be performed. Inspections and analysis to determine NPSH available to each pump will be performed. The analysis will consider vendor test results of required NPSH and the effects of: - pressure losses for pump inlet piping and components, - suction from the ECWS compression tank with operating pressure and water level at their minimum value.	13. A report exists and concludes that the NPSH available exceeds the required NPSH.
14. The ECW compression tank volume accommodates system thermal expansion and contraction, and 7-day system operation without make-up.	14. Inspection and analysis of the as-built ECW compression tank size will be performed to verify that the tank volume accommodates system thermal expansion and contraction, and 7-day system operation without makeup.	14. A report exists and concludes that the as-built ECW compression tank accommodates system thermal expansion and contraction, and 7-day system operation without make-up.
15. The pumps identified in Table 2.7.3.5-2 perform their safety functions under design conditions.	15. Type tests or a combination of type tests and analyses of each pump identified in Table 2.7.3.5-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	15. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.7.3.5-2 perform their safety functions under design conditions.

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6. The seismic Category I piping, including supports, identified in Table 2.7.6.3-2 can withstand seismic design basis loads without a loss of its safety function.

7.a Class 1E equipment, identified in Table 2.7.6.3-1, is powered from its respective Class 1E division.

7.b Separation is provided between redundant divisions of SFPCS Class 1E cables, and between Class 1E cables and non-Class 1E cables.

8. The SFPCS circulates the SFP water through the SFP heat exchangers to remove the decay heat generated by spent fuel assemblies.

9. Displays identified in Table 2.7.6.3-3 are provided in the MCR.

10. Displays, and controls identified in Table 2.7.6.3-3 are provided in the RSC.

11. Controls are provided in the MCR to start and stop the spent fuel pit pumps identified in Table 2.7.6.3-3.

12. The check valves, identified in Table 2.7.6.3-1 as having an active safety function, perform an active safety function to change position as indicated in the table.

13. The pumps identified in Table 2.7.6.3-1 perform their safety functions under design conditions. DCD_03.09.06-69

2.7.6.3.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.6.3-5 describes the ITAAC for the spent fuel pit cooling and purification system.

Table 2.7.6.3-5 Spent Fuel Pit Cooling and Purification System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 5 of 5)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10. Displays, and controls identified in Table 2.7.6.3-3 are provided in the RSC.	10.i Inspection will be performed for retrievability of the displays identified in Table 2.7.6.3-3 in the as-built RSC.	10.i Displays identified in Table 2.7.6.3-3 can be retrieved in the as-built RSC.
	10.ii Tests of the as-built RSC control functions identified in Table 2.7.6.3-3 will be performed.	10.ii Controls in the as-built RSC operate the as-built equipment identified in Table 2.7.6.3-3 with an RSC control function.
11. Controls are provided in the MCR to start and stop the spent fuel pit pumps identified in Table 2.7.6.3-3.	11. Tests will be performed on the as-built spent fuel pit pumps identified in Table 2.7.6.3-3 using controls in the as-built MCR.	11. Controls in the as-built MCR start and stop the as-built spent fuel pit pumps identified in Table 2.7.6.3-3.
12. The check valves, identified in Table 2.7.6.3-1 as having an active safety function, perform an active safety function to change position as indicated in the table.	12. Tests of the as-built check valves identified in Table 2.7.6.3 as having an active safety function will be performed under preoperational test pressure, temperature, and fluid flow conditions.	12. Each as-built check valve identified in Table 2.7.6.3 as having an active safety function changes position as indicated in Table 2.7.6.3-1 under preoperational test conditions.
13. The pumps identified in Table 2.7.6.3-1 perform their safety functions under design conditions.	13. Type tests or a combination of type tests and analyses of each pump identified in Table 2.7.6.3-1 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	13. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.7.6.3-1 perform their safety functions under design conditions.

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10.a The CS/RHR pump starts after receiving a containment spray actuation signal.

10.b The containment spray header containment isolation valves identified in Table 2.11.3-2 open upon receipt of a containment spray actuation signal.

10.c An interlock is provided for each division of CS/RHR to preclude the simultaneous opening of both the RHR discharge line containment isolation valves identified in Table 2.4.5-2 and the corresponding containment spray header containment isolation valves identified in Table 2.11.3-2.

10.d An interlock is provided for each division of CS/RHR to allow opening of the containment spray header containment isolation valves identified in Table 2.11.3-2 only if either of the corresponding two in-series CS/RHR pump hot leg isolation valves identified in Table 2.4.5-2 is closed.

11. Alarms and displays identified in Table 2.11.3-4 are provided in the MCR.

12. Alarms, displays and controls identified in Table 2.11.3-4 are provided in the RSC.

13. The pumps identified in Table 2.11.3-2 perform their safety functions under design conditions. DCD_03.09.06-69

2.11.3.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.11.3-5 describes the ITAAC for the CSS. ITAAC Item 7 in Table 2.4.4-5 describes ITAAC for ECC/CS suction strainer performance.

The ITAAC associated with the CSS equipment, components, and piping that comprise a portion of the CIS are described in Table 2.11.2-2.

2.11.3-5 Containment Spray System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 8 of 8)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13. The pumps identified in Table 2.11.3-2 perform their safety functions under design conditions.	13. Type tests or a combination of type tests and analyses of each pump identified in Table 2.11.3-2 will be performed to demonstrate the ability of the pump to perform its safety function under design conditions.	13. An equipment qualification data summary report exists and concludes that the pumps identified in Table 2.11.3-2 perform their safety functions under design conditions.

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