Vogtle PEmails

From: Habib, Donald
Sent: Wednesday, August 21, 2019 9:51 AM
To: Vogtle PEmails
Subject: Vogtle Units 3 and 4 - LAR 19-XXX, PRHR Natural Circulation FPOT Pre-Submittal Presentation - PUBLIC
Attachments: LAR-19-PRHR NatCirTest PSM Presentation - Public Version Rev B.pptx

Hearing Identifier: Vogtle_COL_Docs_Public
Email Number: 471

Mail Envelope Properties (BL0PR0901MB25146084472F112C56081E0297AA0)

Subject: Vogtle Units 3 and 4 - LAR 19-XXX, PRHR Natural Circulation FPOT Pre-Submittal Presentation - PUBLIC
Sent Date: 8/21/2019 9:50:30 AM
Received Date: 8/21/2019 9:50:33 AM
From: Habib, Donald

Created By: Donald.Habib@nrc.gov

Recipients:
"Vogtle PEmails" <Vogtle.PEmails@nrc.gov>
Tracking Status: None

Post Office: BL0PR0901MB2514.namprd09.prod.outlook.com

Files	**Size**	**Date & Time**	
MESSAGE	3	8/21/2019 9:50:33 AM	
LAR-19-PRHR NatCirTest PSM Presentation - Public Version Rev B.pptx			283556

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

VOGTLE UNITS 3&4

Georgia Power Southern Nuclear

LAR Pre-Submittal Meeting: Removal of the Preoperational Passive Residual Heat Removal Heat Exchanger Natural Circulation Test

August 22, 2019

NUCLEAR DEVELOPMENT

LAR Pre-Submittal Meeting Agenda

- Background Information
- Draft LAR
- Proposed Licensing Bases Changes
- Summary

Background Information

- The VEGP Units 3&4 Combined Licenses (COLs), Appendix C, currently require a Passive Residual Heat Removal (PRHR) heat exchanger (HX) natural circulation test be performed during preoperational testing
- The draft LAR proposes changes to the Vogtle Units 3&4 licensing bases to remove the requirement to perform the preoperational PRHR HX natural circulation testing based on additional methods available to demonstrate that the PRHR HX will perform its design and license bases functions

Draft LAR

Initial Test Program (ITP)

- The ITP is implemented in two phases- preoperational and startup testing
- The objectives of preoperational testing include demonstrating that the plant has been constructed as designed and that the systems will perform consistent with the plant design
- The purpose of preoperational testing of the Passive Core Cooling System (PXS) is to verify that the as-installed components perform the safety functions as described in UFSAR Section 6.3; safety functions of the PXS include emergency core decay heat removal

Draft LAR

Initial Test Program (ITP) (continued)

- UFSAR Subsection 14.2.9.1.3 currently requires three preoperational tests to verify the PXS emergency core decay heat removal function through testing of the PRHR HX
  - Item (e): temperature of the supply/return lines will be recorded to verify natural circulation flow will initiate
  - Item (f): the natural circulation flow rate and the HX supply/return line water temperatures will be measured while the RCS is cooled to ≤ 420°F (this test is required by ITAAC 2.2.03.08b.01) **Proposed to be removed**
  - Item (g): the PRHR cooling will be initiated and the system operated with all four reactor coolant pumps running

Draft LAR

Additional methods are available to demonstrate that the PRHR HX will perform its design and license bases functions

- **ITAAC in COL Appendix C, Table 2.2.3-4**
  - ITAAC 2.2.03.02a- requires that the PRHR HX and associated components meet the ASME Code Section III requirements
  - ITAAC 2.2.03.05a.i- requires that the PRHR HX and associated components meet seismic Category 1 requirements
  - ITAAC 2.2.03.08b.02- requires the elevation of the centerline of the heat exchanger's upper channel head to be greater than the hot leg centerline by 26.3 feet (this will provide assurance that natural circulation flow will initiate as designed)

ITAAC will verify that the PRHR HX and related PXS SSCs were installed at VEGP according to the standard plant AP1000 design and that the PRHR HX will perform its safety-related design function.

Draft LAR

Additional methods are available to demonstrate that the PRHR HX will perform its design and license bases functions (continued)

- **UFSAR Subsection 14.2.9.1.3 Item (e), HX supply/return line water temperature**
  - The test requires the PRHR HX supply and return line piping water temperatures be recorded during hot functional testing of the RCS
  - The test demonstrates that the temperature measured at the supply line of the PRHR HX will be higher than the temperature measured in the return line
  - The temperature difference between the supply and return line, in combination with the elevation difference required by ITAAC 2.2.03.08b.02, demonstrates natural circulation flow can be initiated

This preoperational test will confirm that the PRHR HX can meet its design requirement to initiate natural circulation flow.

Draft LAR

Additional methods are available to demonstrate that the PRHR HX will perform its design and license bases functions (continued)

- **UFSAR Subsection 14.2.9.1.3 Item (g), forced flow test**
  - During hot functional testing, with the RCS at an elevated initial temperature ≥ 350°F, the PRHR HX is initiated and operated with all four reactor coolant pumps running
  - The HX heat transfer rate is determined by measuring the heat exchanger flow rate and its supply and return line temperatures while the RCS is cooled to ≤ 250°F.

  This preoperational test will confirm that the PRHR HX meets its design requirement to transfer core-generated heat to the in-containment refueling water storage tank.

Draft LAR

Regulatory Guide (RG) 1.68, *Initial Test Program for Water-Cooled Nuclear Power Plants*

- RG 1.68 describes the general scope and depth that the NRC considers acceptable for demonstrating compliance with NRC regulations as they pertain to the ITP. The AP1000 conformance statement for Appendix A.4.t of the RG discusses how the requirements are met, including; "… provisions to perform the pre-operational tests of the passive RHR heat exchanger…"
  - The requirement and compliance statement will be met by the following PRHR HX preoperational tests:
    - physical aspects required to initiate natural circulation flow are confirmed by the test described in 14.2.9.1.3 Item (e)
    - heat transfer capability of the PRHR heat exchanger is confirmed by the test described in 14.2.9.1.3 Item (g)

Draft LAR

Regulatory Guide (RG) 1.68, *Initial Test Program for Water-Cooled Nuclear Power Plants*

- In the AP600 Final Safety Evaluation Report, the NRC staff confirmed that an exception to RG 1.68 was acceptable provided:
  - training requirements (UFSAR Subsection 1.9.4.2.1, *TMI Action Plan Issues*, under I.G.1, *Training Requirements*) are met
  - Westinghouse demonstrates that all plants remain identical in physical layout and configuration of the proposed plant key components, and validate that acceptance criteria for the ranges of values for other system flow performance measurements taken during the ITP confirm that the overall flow characteristics of the proposed plant are equivalent to the reference plant

Demonstrations of the layout of primary components as well as flow measurements are confirmed during the ITAAC closure process and preoperational testing.

Proposed Licensing Bases Changes

COL Appendix C ITAAC

- ITAAC 2.2.03.08b.01, which requires that a heat removal performance test and analysis of the PRHR heat exchanger be performed with the reactor coolant pumps stopped, is proposed to be removed.

UFSAR Tier 2

- UFSAR Subsection 1.9.4.2.1, Item I.G.1, is proposed to be revised to remove references to the PRHR heat exchanger natural circulation test (e.g., the AP1000 response will be modified to remove the discussion on the test, text within Item No. 1 is replaced with “Not Used” and the last sentence of Item 6 is deleted).

- UFSAR Subsection 3.9.1.1.1.17 is proposed to be revised to reflect the PRHR heat exchanger flow rates are confirmed during the ITP. In addition, the sentence which discusses cooling the RCS with the PRHR for 30 minutes will be replaced with one which discusses temperature and pressure responses to the testing being based on a conservative definition of the test conditions with a total of 5 occurrences.

Proposed Licensing Bases Changes

UFSAR Tier 2 (continued)

- UFSAR Subsection 6.3.6.1.2 is proposed to be revised to reflect the initial verification of the heat transfer capability of PRHR HX is performed by conducting the forced flow test and to point to the description of the test in Subsection 14.2.9.1.3 Item (g). In addition, the last sentence of the subsection is deleted.

- UFSAR Subsection 14.2.9.1.3

  - Item (e) is proposed to be revised to replace “initiates” with “can initiate.”

  - Item (f) is proposed to be revised to remove the requirement to perform the preoperational PRHR heat exchanger natural circulation test (i.e., Item (f) will be replaced with “Not Used.”)

Summary

SNC proposes to remove the preoperational PRHR HX natural circulation test from the scope of the VEGP Units 3&4 ITP

- The following methods are available to demonstrate the PRHR HX will perform its design and license bases functions:
  - ITAAC in COL Appendix C, Table 2.2.3-4
  - UFSAR Subsection 14.2.9.1.3 Item (e), Supply/Return line water temperature of PRHR HX
  - UFSAR Subsection 14.2.9.1.3 Item (g), PRHR HX forced flow test