Vogtle PEmails

From: Thomas, Corey (SNC) <BRCThoma@southernco.com>
Sent: Friday, May 12, 2017 2:44 PM
To: Patel, Chandu
Subject: [External_Sender] FW: LAR-084 Tech Spec Change (CAPAL)
Attachments: LAR 84 COL and Tier 2 Star Markups SS 5-10-17.pdf

Chandu, this is an update of the proposal I sent previously. Page 1 of the attached markup highlights what we would like to discuss / get feedback on. We would like to discuss with your Tech Spec and Test Program folks.

Thanks
Corey

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otherwise confirm that the tested systems perform their specified functions in accordance with AP1000 DCD Rev. 19, Section 14.2.9,

(c) SNC shall notify the Director of NRO, or the Director's designee, in writing, upon successful completion of the design-specific pre-operational tests identified in Section 2.D.(2)(a) of this license; and

(d) SNC shall notify the Director of NRO, or the Director's designee, in writing, upon the successful completion of all the ITAAC included in Appendix C to this license.

(3) Nuclear Fuel Loading and Pre-critical Testing

(a) Until the submission of the notification required by Section 2.D.(2)(c) of this license, SNC shall not load fuel into the reactor vessel;

(b) Upon submission of the notification required by Section 2.D.(2)(c) of this license and upon a Commission finding in accordance with 10 CFR 52.103(g) that all the acceptance criteria in the ITAAC in Appendix C to this license are met, SNC is authorized to perform pre-critical tests in accordance with the conditions specified herein;

(c) SNC shall perform the pre-critical tests identified in AP1000 DCD Rev. 19, Section 14.2.10.1;

(d) SNC shall review and evaluate the results of the tests identified in Section 2.D.(3)(c) of this license and confirm that these test results are within the range of acceptable values predicted or otherwise confirm that the tested systems perform their specified functions in accordance with AP1000 DCD Rev. 19, Section 14.2.10; and

(e) SNC shall notify the Director of NRO, or the Director's designee, in writing, upon successful completion of the pre-critical tests identified in Section 2.D.(3)(c) of this license.

(4) Initial Criticality and Low-Power Testing

(a) Upon submission of the notification required by Section 2.D.(3)(e) of this license, SNC is authorized to operate the facility at reactor steady-state core power levels not to exceed 5-percent thermal power in accordance with the conditions specified herein;

and

(b) SNC shall perform the initial criticality and low-power tests identified in AP1000 DCD Rev. 19, Sections 14.2.10.2 and 14.2.10.3, respectively, the Natural Circulation (first plant test) identified in AP1000 DCD Rev. 19, Section 14.2.10.3.6, ~~and the~~

The requirements of Technical Specification 3.4.4 may be suspended during the performance of the Natural Circulation (for the first plant) identified in AP1000 DCD Rev. 19, Section 14.2.10.3.6, provided the Reactor is tripped if power exceeds 5% RTP.

~~Passive Residual Heat Removal Heat Exchanger (first plant test) identified in AP1000 DCD Rev. 19, Section 14.2.10.3.7~~;

(c) SNC shall review and evaluate the results of the tests identified in Section 2.D.(4)(b) of this license and confirm that these test results are within the range of acceptable values predicted or otherwise confirm that the tested systems perform their specified functions in accordance with AP1000 DCD Rev. 19, Sections 14.2.10.2 and 14.2.10.3; and

(d) SNC shall notify the Director of NRO, or the Director's designee, in writing, upon successful completion of initial criticality and low-power tests identified in Section 2.D.(4)(b) of this license, including the design-specific tests identified therein.

(5) Power Ascension Testing

(a) Upon submission of the notification required by Section 2.D.(4)(d) of this license, SNC is authorized to operate the facility at reactor steady-state core power levels not to exceed 100-percent thermal power in accordance with the conditions specified herein, but only for the purpose of performing power ascension testing;

and the Passive Residual Heat Removal Heat Exchanger (first plant only) identified in AP1000 DCD Rev. 19, Section 14.2.10.4.29

(b) SNC shall perform the power ascension tests identified in AP1000 DCD Rev. 19, Section 14.2.10.4, the Rod Cluster Control Assembly Out of Bank Measurements (first plant test) identified in the AP1000 DCD, Rev. 19, Section 14.2.10.4.6, and the Load Follow Demonstration (first plant test) identified in AP1000 DCD, Rev. 19, Section 14.2.10.4.~~22~~;

(c) SNC shall review and evaluate the results of the tests identified in Section 2.D.(5)(b) of this license and confirm that these test results are within the range of acceptable values predicted or otherwise confirm that the tested systems perform their specified functions in accordance with AP1000 DCD Rev.19, Section 14.2.10.4; and

(d) SNC shall notify the Director of NRO, or the Director's designee, in writing, upon successful completion of power ascension tests identified in Section 2.D.(5)(b) of this license, including the design-specific tests identified therein.

(6) Maximum Power Level

Upon submission of the notification required by Section 2.D.(5)(d) of this license, SNC is authorized to operate the facility at steady state reactor core power levels not to exceed 3400 MW thermal (100-percent thermal power), as described in the FSAR, in accordance with the conditions specified herein.

1) 9 months following initial criticality,

2) 90 days after completion of the ITP, or

3) 90 days after start of commercial operations. If one report does not cover all three events, then supplemental reports are submitted every three months until all three events are completed. These reports:

- Address each ITP test described in the FSAR.
- Provide a general description of measured values of operating conditions or characteristics obtained from the ITP as compared to design or specification values.
- Describe any corrective actions that were required to achieve satisfactory operation.
- Include any other information required by license conditions.

14.2.4 Compliance of Initial Test Program with Regulatory Guides

Subsection 1.9.1 and Table 1.9-1 discuss compliance with the applicable NRC regulatory guides.

14.2.5 Utilization of Reactor Operating and Testing Experience in the Development of Initial Test Program

[Natural Circulation Test (PRHR HX)]*	[14.2.10.4.29]*

The design, testing, startup, and operating experience from previous pressurized water reactor plants is utilized in the development of the preoperational and startup test program for the AP1000 plant. Other sources of experience reported and described in documents such as NRC reports, including Inspection and Enforcement bulletins and Institute of Nuclear Power Operations (INPO) reports, including Significant Operating Event Reports (SOER), are also utilized in the AP1000 preoperational and startup test program.

Special tests to further establish a unique phenomenological performance parameter of the AP1000 design features beyond testing performed for Design Certification of the AP600 and that will not change from plant to plant, are performed for the first plant only. Because of the standardization of the AP1000 design, these special tests (designated as first plant only tests) are not required on follow plants. These first plant only tests are identified in the individual test descriptions. (See Subsections 14.2.9 and 14.2.10.) The following is a listing of the first plant only tests, and the corresponding section in which they appear

First Plant Only Test	Section
IRWST Heatup Test	14.2.9.1.3 Item (h)
Pressurizer Surge Line Stratification Evaluation	14.2.9.1.7 Item (d)
Reactor Vessel Internals Vibration Testing	14.2.9.1.9 – Prototype Test
[*Natural Circulation Tests*]*	14.2.10.3.6, ~~[*14.2.10.3.7*]*~~
Rod Cluster Control Assembly Out of Bank Measurements	14.2.10.4.6
Load Follow Demonstration	14.2.10.4.22

(Steam Generator)

Other special tests which further establish a unique phenomenological performance parameter of the AP1000 design features beyond testing performed for Design Certification for the AP600 and that will not change from plant to plant, are performed for the first three plants. Because of the standardization of the AP1000 design, once these special tests have affirmed consistent passive system function

*NRC Staff approval is required prior to implementing a change in this information.

14.2.10.3.7 Passive Residual Heat Removal Heat Exchanger (First Plant Only)

Objective

[*Demonstrate the heat removal capability of the passive residual heat removal heat exchanger with the reactor coolant system at prototypic temperatures and natural circulation conditions.*]* Note that this test is performed in conjunction with the reactor coolant system natural circulation test with heat removal via the steam generators described in Subsection 14.2.10.3.6.

Prerequisites

As described in Subsection 14.2.10.3.6, the following prerequisites have been met in preparation for the natural circulation test with heat removal via the steam generators:

- The reactor is critical and the neutron flux level is within the range for low power physics testing.
- The neutron flux level and reactor coolant system boron concentration and temperature are stable, and the controlling rod bank is positioned in such a way that an increase in core power level to approximately 5 percent can be achieved by rod motion only.
- Reactor coolant pumps are running.
- The reactivity computer is installed, checked out, and operational, with input flux signals representative of the core average neutron flux level.
- Instrumentation and data collection equipment is operational and available for logging plant data.
- Special instrumentation is available to measure the reactor vessel ΔT with high precision at low power levels.
- The passive residual heat removal heat exchanger inlet and outlet temperature instrumentation and heat exchanger flow instrumentation are calibrated and operational.
- The passive residual heat exchanger inlet isolation valve is operational and in its open position, and the heat exchanger outlet isolation valves are operational and in their closed position.
- The startup feedwater system and controls are operating properly to maintain the steam generator secondary side water levels.
- The steam generator steam dump system is operating properly to maintain steam generator pressure so that the reactor coolant system cold leg fluid is at its expected temperature.
- The chemical volume control system auxiliary spray and letdown flow path are operable for controlling the pressurizer pressure and level, respectively after the reactor coolant pumps are shutoff.

Test Method

[*Note that the following test steps are to be performed at the conclusion of the natural circulation test with heat removal via the steam generators.*

- *Verify that the natural circulation test with core power being removed by dumping steam from the steam generators has been completed.*

*NRC Staff approval is required prior to implementing a change in this information.

- *Initiate flow through the passive residual heat removal heat exchanger by slowly opening one of the two parallel heat exchanger outlet isolation valves until it is fully open*.

- *The steam generator steam dump will automatically reduce heat removal by the steam generators in response to passive residual heat exchanger operation. Manual operation of the control rods may be required to maintain core power at approximately 3 percent*.

- *Obtain heat exchanger flow and inlet/outlet temperature data to characterize the heat removal capability of the heat exchanger and heatup of the in-containment refueling water storage tank water with one of two parallel isolation valves open*.

- *Close the open heat exchanger isolation valve to terminate the heat exchanger test. The steam generator steam dump should automatically maintain the reactor coolant system fluid average temperature constant. Note that operation of the passive residual heat exchanger should be terminated before the in-containment refueling water storage tank average water temperature exceeds 150°F.*

- *Shutdown the reactor by inserting the control rods. Restart reactor coolant pumps only after the reactor is shutdown and isothermal conditions are re-established.*]*

Performance Criteria

[*The measured passive residual heat exchanger heat removal rate is equal to or greater than the heat removal rate predicted by the methodology used in the safety analyses at the measured hot leg and in-containment refueling water temperatures.*]*

14.2.10.4 Power Ascension Tests

After low power testing is completed, testing is performed at specified elevated power levels to demonstrate the facility operates in accordance with design during normal steady-state operations, and to the extent practical, during and following anticipated transients. During power ascension, tests are performed to obtain operational data and to demonstrate the operational capabilities of the plant.

14.2.10.4.1 Test Sequence

Objective

Define the sequence of operations, beginning at approximately 5 percent rated thermal power, that constitutes the power ascension testing program.

Prerequisite

Plant system conditions are established, as required, by the individual test instruction within this sequence.

Test Method

Present the sequence of operations and tests, along with instructions, specific plant conditions, and test procedures.

Performance Criteria

Relevant performance criteria are provided in each of the test procedures.

*NRC Staff approval is required prior to implementing a change in this information.

- Reduce steam flow by the appropriate amount and allow plant conditions to reach a new steady-state (approximately 10 minutes).

- Take a pair of feedwater heaters out of service.

Performance Criteria

The plant control systems properly respond to the loss of a main feedwater heater, without reactor or turbine trip.

The operator successfully removes a pair of feedwater heaters from service without causing a reactor trip.

14.2.10.4.28 Remote Shutdown Workstation

Objective

Demonstrate the ability of the operators to conduct a remote shutdown of the plant during a simulated main control room evacuation.

Prerequisites

Approved operation procedures for performing a remote shutdown is available. Communication exists between the control room and the remote shutdown room. Procedures for transferring control back to the main control room are available if an emergency or unsafe condition develops during the testing that cannot be managed by the shutdown crew.

The plant is operating in a steady-state condition at 10-20 percent of power.

Test Method

- Using the appropriate operating procedures, the operators transfer control of the plant from the main control room to the remote shutdown workstation.

- From the remote shutdown workstation, the operators bring the plant to hot standby, and maintain hot standby conditions for at least 30 minutes.

- From the remote shutdown workstation, the operators lower the reactor coolant system pressure and temperature to the appropriate conditions, and place the normal residual heat removal system into service. The normal residual heat removal system, in conjunction with the component cooling water system and service water system are used to cool the plant at least 50°F without exceeding prescribed cooldown limits.

Performance Criteria

The operators successfully demonstrate the ability transfer control of the plant to the remote shutdown workstation, shut down the reactor, maintain hot standby, and then demonstrate the ability to transition to cold shutdown conditions, while performing these operations from the remote shutdown workstation.

See next page Insert

14.2.10.4.~~29~~ 30 Cooling Tower(s)

Objectives

- Verify proper cooling tower(s) function. Provide thermal acceptance testing of the cooling tower's heat removal capabilities.

Insert for UFSAR Subsection 14.2.10.4.29

14.2.10.4.29 Passive Residual Heat Removal Heat Exchanger (First Plant Only)

Objective

[Demonstrate the heat removal capability of the passive residual heat removal heat exchanger with the reactor coolant system at prototypic temperatures and natural circulation conditions.]*

Note that this test is performed after sufficient power operation to provide decay heat to perform the test.

Prerequisites

- The reactor is critical and has operated at full power for sufficiently long enough to provide decay heat after shutdown.
- The reactor coolant pumps are running.
- Instrumentation and data collection equipment is operational and available for logging plant data.
- The passive residual heat exchanger inlet isolation valve is operational and in its open position, and the heat exchanger outlet isolation valves are operational and in their closed position.
- A reactivity control plan has been developed and is available for test performance.

Test Method

- [TRIP the reactor.
- TRIP the running reactor coolant pumps.
- Verify natural circulation commences with decay heat being removed by dumping steam from the steam generators.
- Initiate flow through the passive heat removal heat exchanger by slowly opening one of the two parallel heat exchanger outlet isolation valves until it is fully open.
- The steam generator steam dump will automatically reduce heat removal by the steam generators in response to passive residual heat exchanger operation.
- Obtain PRHR heat exchanger flow and inlet/outlet temperature data to characterize the heat removal capability of the PRHR heat exchanger and heatup of the in-containment refueling water storage tank water with one of the two parallel isolation valves open.
- Close the open heat exchanger isolation valve to terminate the heat exchanger test. The steam generator steam dump should automatically maintain the reactor coolant system fluid average temperature constant. Note that operation of the passive residual heat exchanger should be terminated before the in-containment refueling water storage tank average water temperature exceeds 150°F.
- Restart reactor coolant pumps only after isothermal conditions are re-established.]*