New TSTF Traveler Presubmittal Discussion

November 9, 2017

Presubmittal Discussions

- The TSTF has developed four new travelers, which were provided in draft to the staff
- The purpose of the discussion is do confirm that the draft travelers contain sufficient information to support NRC staff review

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- Applicable to all plant types
- Optional new TS program for plants revising their spent fuel pool criticality analysis to credit neutron absorbers
- NRC concern is that the neutron absorbing materials used in some spent fuel pools may degraded over time and should be monitored
- NRC has been requiring monitoring requirements in new LARs, but the approaches and level of detail were inconsistent

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- At the May 2, 2013 TSTF/NRC quarterly meeting, the NRC stated the TS should include requirements to monitor spent fuel pool neutron absorber materials, and requested that the TSTF propose appropriate controls
- TSTF worked with the NEI Spent Fuel Pool Criticality Task Force

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- There were a series of TSTF/NEI/NRC discussions, including discussion at the 2014 Regulatory Information Conference
- The TSTF created an analysis of whether neutron absorber monitoring met any regulatory requirement for a TS
  - Concluded that there is no explicit requirement, but an Administrative Controls program would not be inconsistent with the existing TS

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- On November 7, 2014, held a drop in meeting with:
  - Rod McCullum and Kris Cummings (NEI)
  - Brian Mann (TSTF)
  - Tim McGinty (Director, Division of Safety Systems), Rob Tayler (Deputy Director), Chris Jackson (Chief, Reactor Systems Branch), and Rob Elliott (Chief, Technical Specifications Branch)

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- Discussed an approach to resolve the concern:
  - Expedite NRC review and approval of proposed industry monitoring program
  - Create a traveler that adds an Administrative Controls program that references the NRC approved program
  - In the interim, TSTF to create a T-traveler to provide guidance to licensees submitting LARs to revise spent fuel pool criticality analysis
    - TSTF-557-T, Rev. 0

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- Discussed an approach to resolve the concern:
  - NRC had been reviewing NEI 12-16, “Guidance for Performing Criticality Analyses of Fuel Storage at Light-Water Reactor Power Plants,” which includes a section on monitoring
  - On TSTF recommendation, NEI extracted the monitoring description into NEI 16-03, "Guidance for Monitoring of Fixed Neutron Absorbers in Spent Fuel Pools"
    - Approved by the NRC in March 2017.
  - The traveler would add an Administrative Controls neutron absorber monitoring program that implements NEI 16-03.

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- Proposed Administrative Control Program:

5.5.XX <u>Spent Fuel Storage Rack Neutron Absorber Monitoring Program</u>

This Program provides controls for monitoring the condition of the neutron absorber used in the spent fuel pool storage racks to verify the neutron absorber density is consistent with the assumptions in the spent fuel pool criticality analysis. The program shall be in accordance with NEI 16-03-A, "Guidance for Monitoring of Fixed Neutron Absorbers in Spent Fuel Pools," Revision 0, May 2017[, with the following exceptions:

1.].

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

- No model application.
  - Program would be proposed as part of a LAR to revise the spent fuel pool criticality analysis
- Bracketed. Only plants that credit neutron absorbing materials in their SFP criticality analysis require a monitoring program
- Could be voluntary, plant-specific adoption by plants with existing monitoring programs
- The traveler references, but does not repeat, the technical justification in NEI 16-03.

TSTF-557, Rev. 1, "Spent Fuel Storage Rack Neutron Absorber Monitoring Program"

Discussion

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Applicable to all BWR plants
- Revises Mode 3 and 4 TS Actions for inoperable RHR Shutdown Cooling (SDC) subsystems
- Addresses several shortcoming in the existing actions that have been discussed with the Tech Spec Branch and was the subject of inspection actions

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Issue 1
  - If a required RHR SDC subsystem is inoperable in Mode 3, 4 or 5, the Actions require an alternate method of decay heat removal to be available for each inoperable RHR shutdown cooling subsystem
  - The TS Bases state that the required cooling capacity of the alternate method should be capable of maintaining or reducing temperature
  - In periods of high decay heat load, the BWR design does not include any alternates that would satisfy the Required Action
- Basis of URIs for Perry (now closed) and Monticello

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Issue 2
  - In Mode 3 or 4, if there is no alternate method of decay heat removal for each inoperable RHR SDC subsystem, there is no TS Action to follow.
  - The lack of a terminal action has raised questions from the NRC
- Also basis of URIs for Perry (now closed) and Monticello

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Issue 3
  - If one or more RHR shutdown cooling subsystems are inoperable in Mode 3, the plant must be in Mode 4 in 24 hours.
  - With no operable RHR SDC subsystem, it may not be possible to reduce the RCS temperature to Mode 4 (typically < 200 °F) within 24 hours in period of high decay heat load

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Issue 4
  - There are circumstances in which RHR SDC is inoperable (such as loss of seismic qualification or nonfunctional support systems), but still meets the Bases description of an alternate decay heat removal method (capable of maintaining or reducing temperature)
  - The use of an inoperable but functional RHR SDC subsystem as an alternate was the subject of a violation.

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Because of the redundancy and reliability of the RHR SDC system, these issues have rarely presented a problem
- However, because of the NRC inspection actions, the TSTF agreed to propose a traveler to resolve them

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Changes
  - Restructured RHR/SDC Actions in Modes 3 and 4 to require establishment of an alternate method within 1 hour, followed by a default action to initiate immediate action to restore RHR SDC to operable status
    - Provides terminal action consistent with PWR RHR TS
  - Eliminated Mode 3 requirement to go to Mode 4
    - Mode 4 eliminates a potential heat removal mechanism

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

- Changes
  - Revised the Mode 3, 4, and 5 TS Bases to state an inoperable but functional RHR SDC subsystem can be an alternate if it can maintain or reduce RCS temperature:
    - RHR SDC is the design method to remove decay heat and is backed by emergency power
    - RHR SDC has far greater heat removal capacity than other alternates (RWCU, SFP Cleanup)
  - Other Bases changes are discussed in the traveler

TSTF-566, Rev. 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

Discussion

TSTF-568, “Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2”

- Applicable to BWR/2, BWR/3, BWR/4, and some early BWR/5 plants (NUREG-1433)
- Clarifies the intent of the existing Applicability of:
  - TS 3.6.2.5, "Drywell-to-Suppression Chamber Differential Pressure,"
    - Browns Ferry, Dresden, Fitzpatrick, and Quad Cities,
  - TS 3.6.3.2, "Primary Containment Oxygen Concentration“
    - All BWR/2, BWR/3, BWR/4, and BWR/5 units

TSTF-568, "Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2"

- Current Applicability:

  MODE 1 during the time period:

  a. From [24] hours after *THERMAL POWER is > [15]% RTP* following startup, to

  b. [24] hours prior to reducing *THERMAL POWER to < [15]% RTP* prior to the next scheduled reactor shutdown.

- Current Action:
  - Reduce THERMAL POWER to ≤ [15]% RTP.

TSTF-568, "Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2"

- NRC inspection issue raised question of whether Applicability is Mode 1 or Mode 1 > [15]% RTP

- Based on TSTF research, determined the correct applicability is Mode 1 > [15]% RTP

TSTF-568, "Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2"

- TSTF determined that all plants with TS 3.6.2.5, except Browns Ferry, have NRC-approved analyses that support operation below 15% RTP without meeting the differential pressure limit is acceptable
  - Proposed change to TS 3.6.2.5 is not applicable to Browns Ferry.

TSTF-568, “Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2”

- All BWR/2, BWR/3, BWR/4, and BWR/5 plants with Mark I or II containments have TS 3.6.3.2 primary containment oxygen concentration.
- The existing Bases for the Primary Containment Oxygen Concentration states, "As long as reactor power is < 15% RTP, the potential for an event that generates significant hydrogen is low and the primary containment need not be inert."

TSTF-568, "Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2"

- Revised the TS 3.6.2.5 and TS 3.6.3.2 Applicability to state:
  - Mode 1 with THERMAL POWER > [15%] RTP
- Added the following Notes to SR 3.6.2.5.1 and SR 3.6.3.2.1:
  - 1. Not required to be met until 24 hours after THERMAL POWER > [15]% RTP.
  - 2. Not required to be met 24 hours prior to THERMAL POWER being reduced ≤ [15]% RTP.

TSTF-568, "Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2"

- Elimination of the undefined terms "startup" and "next scheduled reactor shutdown" is justified in the traveler

- The proposed change clarifies the intent of the existing requirements and is consistent with the plant design and safety analysis

TSTF-568, "Clarify Applicability of BWR/4 TS 3.6.2.5 and TS 3.6.3.2"

Discussion

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- Overview discussion. Separate presubmittal meeting requested.
- Technical change applicable to Westinghouse and Combustion Engineering plants
- Revises the definitions of:
  - Engineered Safety Feature (ESF) Response Time (W and CE)
  - Reactor Trip System (RTS) Response Time (W),
  - Reactor Protection System (RPS) Response Time (CE)

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- In 1991-2001, EPRI, Westinghouse, and Combustion Engineering requested and received approval to use allocated response times for certain components in lieu of measured response times
  - The Topical Reports evaluated specific components in specific instrument functions

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- Response time testing is very resource-intensive and often requires specialized contractor services, prompting the industry efforts to use allocated response times for some components
- Many of the evaluated components are obsolete and replacement components cannot be obtained

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- The PWROG considered submitting a new topical report evaluating new components in a manner similar to the obsolete components, but this simply delayed the issue, is very expensive and time consuming, and limits the use of new components
- Instead, TSTF-569 requests NRC approval to allow licensees to apply the Topical Report method to new components

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- Current Definition and Proposed Change:
  - The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the ~~components and~~ methodology for verification has ~~have~~ has been previously reviewed and approved by the NRC.
- A similar change is made for RPS and RTS Response Time

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- The traveler justifies that the earlier method is appropriate for a licensee to apply to new components

TSTF-569, Rev. 0, "Revise Response Time Testing Definition"

- Industry participants in presubmittal meeting:
  - TSTF
  - PWROG
  - Westinghouse

- Discussion