PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

PSEG
Nuclear LLC

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U. S. Nuclear Regulatory Commission
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Salem Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: **License Amendment Request: Revise Minimum Required Channels, Mode Applicability and Actions for the Source Range and Intermediate Range Neutron Flux Reactor Trip System Instrumentation Technical Specifications**

In accordance with the provisions of 10 CFR 50.90, PSEG Nuclear LLC (PSEG) is submitting a request for an amendment to the Technical Specifications (TS) for Salem Generating Station (Salem) Units 1 and 2.

The proposed amendment will revise Salem Unit 1 and Unit 2 Technical Specification (TS) 3/4.3.1, "Reactor Trip System Instrumentation," specifically the Limiting Condition for Operation (LCO) and Action for TS 3.3.1.1, Table 3.3-1 associated with the Intermediate Range (IR) and Source Range (SR) neutron flux channels, Table 3.3-1 Functional Units 5 and 6 respectively. The proposed revision is intended to address conditions of SR and IR inoperability that would mandate entry into TS 3.0.3. The changes also align the Salem TS with the design basis analyses for the SR and IR reactor trip functions.

The Enclosure provides a description and assessment of the proposed changes. Attachment 1 provides the existing TS pages marked up to show the proposed changes. Attachment 2 provides TS Bases markups of the proposed changes for information only.

PSEG requests approval of this license amendment request (LAR) in accordance with standard NRC approval process and schedule. Once approved, the amendment will be implemented within 60 days from the date of issuance.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated State of New Jersey Official.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Mr. Michael Wiwel at 856-339-7907.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 10/23/19
(Date)

Respectfully,

Charles V. McFeaters
Site Vice President
Salem Generating Station

Enclosure: Evaluation of the Proposed Changes
Attachment 1 Mark-up of Proposed Technical Specification Pages
Attachment 2 Proposed Technical Specification Bases Pages – For Information Only

cc: Administrator, Region I, NRC
NRC Project Manager
NRC Senior Resident Inspector, Salem
Mr. P. Mulligan, Chief, NJBNE
PSEG Corporate Commitment Tracking Coordinator
Salem Commitment Tracking Coordinator

Enclosure

Evaluation of the Proposed Changes

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ATTACHMENT:

1. Mark-up of Proposed Technical Specification Pages
2. Mark-up of Proposed Technical Specification Bases Pages – For Information Only

1.0 SUMMARY DESCRIPTION

The proposed amendment will revise Salem Unit 1 and Unit 2 Technical Specification (TS) 3/4.3.1, "Reactor Trip System Instrumentation" Limiting Condition for Operation (LCO) 3.3.1.1 to address conditions of channel inoperability that are currently not described in the TS which would mandate entry into TS Action 3.0.3. The specific TS changes pertain to the Applicable Modes and required LCO Actions associated with the Source Range (SR) and Intermediate Range (IR) Neutron Flux trip channels. The proposed changes also better align the Salem TS with the design basis analyses of the SR and IR trip functions.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The proposed changes to the Salem TS are associated with the design and operation of the reactor trip system (RTS) trip functions of the SR and IR neutron flux instrument channels. The RTS consists of all components from the field-mounted process instrumentation (e.g., transmitters, temperature sensors, neutron detectors) to the reactor trip breakers, whose functioning initiates a reactor trip when required. Salem Updated Final Safety Analysis Report (UFSAR) Section 7.2 states that the RTS includes the Nuclear Instrumentation System (NIS), process control system, and the Solid State Protection System (SSPS).

The primary function of the NIS is to protect the reactor core by monitoring neutron flux and generating appropriate trips and alarms in response to positive reactivity insertion events that can occur during various phases of reactor operating, startup and shutdown conditions. It also indicates the status of reactor power during startup and power operation. The NIS consists of three discrete, overlapping ranges. They are the SR, IR and Power Range (PR) instruments. Reactor startup and power ascension require a permissive signal from the higher range instrumentation channels before the operator can manually block the trip function from the lower range instrument.

The PR neutron flux trip circuit initiates a reactor trip when two of the four PR channels exceed the Trip Setpoint. There are two bistables per PR channel used for a high and low reactor trip setting. The PR neutron flux - low setting reactor trip, which provides over power protection during startup, can be manually blocked when two out of the four PR channels indicate above approximately 10 percent power (permissive P-10). Three out of the four PR channels indicating below P-10 automatically reinstates the PR neutron flux - low setting reactor trip.

The IR neutron flux trip circuit initiates a reactor trip when any one out of two IR channels exceeds the Trip Setpoint (i.e. no combinatorial logic). This reactor trip, which provides overpower protection during reactor startup, can be manually blocked when two out of the four PR channels are above P-10. Three out of the four PR channels indicating below P-10 automatically reinstates the IR neutron flux reactor trip.

The SR neutron flux trip circuit initiates a reactor trip when one out of two SR channels exceeds the Trip Setpoint. This reactor trip can be manually blocked when one out of two IR channels indicates above the permissive P-6 setpoint value, and is automatically reinstated when both IR channels decrease below P-6. The SR trip function is automatically blocked by the P-10 permissive. The SR neutron flux reactor Trip Setpoint is established between the P-6 setpoint and the upper range of the SR scale.

The PR neutron flux - low setting reactor trip, IR neutron flux reactor trip, and SR neutron flux reactor trip described above are designed to protect the reactor core against postulated power excursions during reactor startup and low power operation. The SR and IR neutron flux reactor trips provide redundant protection to the PR neutron flux – low setting reactor trip. No credit is taken for the reactor trip functions associated with either the SR or IR channels in the accident analyses described in Chapter 15 of the Salem UFSAR. Those reactor trip functions that are credited in the accident analyses are detailed in the June 2, 2015 letter from PSEG to NRC providing supplemental information regarding replacement of the SR and IR instrumentation (Reference 6.3). The functional capability of the SR and IR subsystems of the NIS enhances the overall reliability of the Reactor Trip System (RTS).

2.2 Current Technical Specification Requirements

The current Salem Unit 1 and Unit 2 TS affected by the proposed changes are associated with TS LCO 3.3.1.1 Table 3.3-1, Functional Unit 5 (IR Neutron Flux) and Functional Unit 6 (SR Neutron Flux). The LCO requirements and Applicable Modes for these two Functional Areas are as follows:

FUNCTIONAL UNIT	TOTAL NUMBER OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. Intermediate Range, Neutron Flux	2	1	2	1, 2 and *	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2 and *	4

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

The Action Statements associated with the LCOs for Functional Unit 5 (IR) and Functional Unit 6 (SR) affected by the proposed changes are shown below. Note that Action 3.d is applicable to Salem Unit 2 only:

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above P-6 but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.

c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.

d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable. ***(Applicable to Salem Unit 2 TS only)***

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above P-6, operation may continue.

2.3 Reason for Proposed Change

The proposed changes to TS 3.3.1.1, Table 3.3-1 Action 3 and Action 4 will provide specific direction for the condition where two IR channels or two SR channels respectively are not OPERABLE. This condition is not specifically covered in the Salem TS, thus requiring entry into TS 3.0.3 which is inconsistent with the design basis of the IR and SR trip functions and is inconsistent with the direction identified in Revision 4 of NUREG-1431(Westinghouse Standard Improved Technical Specifications). The proposed change will also eliminate the inconsistency between Salem Unit 1 and Unit 2 relative to TS 3.3-1 Action 3 and applicability of TS 3.0.3.

The additional proposed changes to TS Table 3.3-1 Action 4 for one inoperable SR channel in Startup will provide a specified time interval for restoring the inoperable SR channel to OPERABLE status and recognizes the design basis of the SR trip function above the P-6 interlock setpoint.

The proposed changes to Functional Unit requirements in TS Table 3.3-1 will provide clear alignment between the modes of applicability for the IR and SR channels and the proposed changes to the corresponding Action statements. The proposed changes to the modes of applicability are in alignment with the design basis of the SR and IR trip functions and conform to the corresponding modes of applicability for SR and IR channels described in NUREG-1431.

The proposed change to TS Table 3.3.1-1 to provide a new Functional Unit 6.C and new associated Action 7 provides improved clarity for the SR Neutron Flux trip function requirements in Modes 3, 4 and 5 with the reactor trip breakers (RTBs) closed and the control rod drive system (CRDS) capable of rod withdrawal. The proposed new Action 7 also provides direction for the condition of two inoperable SR channels which is not currently addressed in the Salem TS.

2.4 Description of Proposed Change

The proposed changes to the Salem TS are described below and are indicated on the marked up TS pages provided in Attachment 1 of this enclosure. Deletions are indicated with a strike through and additions are marked in double underlines.

Revise the TS Index to reflect an updated Bases Page number. Revise the Applicable Modes for the SR and IR instrumentation in TS Table 3.3-1, "Reactor Trip System Instrumentation," to better align with the design basis analyses for the associated reactor trip functions. Specifically, revise Functional Unit 5 (IR Neutron Flux) in TS Table 3.3-1 to apply limits in the range of power for Modes 1 and 2 in the Applicable Modes column. Remove the asterisk condition for Functional Unit 5. Revise Functional Unit 6.A (SR Neutron Flux - Startup) in TS Table 3.3-1 to limit its Applicable Mode to below P-6 and move the asterisk condition from its Applicable Mode to a new Functional Unit 6.C (SR Neutron Flux – Shutdown) to clarify SR channel trip requirements in Shutdown Modes 3, 4 and 5 when the RTBs are closed and the CRDS is capable of rod withdrawal.

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BASES

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NUMBER OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNEL OPERABLE	APPLICABLE MODES	ACTION
5. Intermediate Range, Neutron Flux	2	1	2	1[(a)], 2[(b)] ~~and *~~	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2[(c)] ~~and *~~	4

B. Shutdown	2	0	1	3, 4 and 5	5
C. Shutdown	2	1	2	3*, 4* and 5*	7

(a) Below the P-10 (Power Range Neutron Flux) interlocks
(b) Above the P-6 (Intermediate Range Neutron Flux) interlocks
(c) Below the P-6 (Intermediate Range Neutron Flux) interlocks

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

Replace the text of Unit 1 and Unit 2 Action 3 for IR Neutron Flux (Functional Unit 5) in TS Table 3.3-1, "Reactor Trip System Instrumentation," with the following:

ACTION 3 - With the number of channels OPERABLE:

a. One less than required by the Minimum Channels OPERABLE requirement

1. Reduce THERMAL POWER to < P-6 within 24 hours or,

2. Increase THERMAL POWER to > P-10 within 24 hours

b. Two less than required by the Minimum Channels OPERABLE requirement

1. Immediately suspend operations involving positive reactivity additions** and,

2. Reduce THERMAL POWER to < P-6 within 2 hours

**Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

Replace the text of Action 4 for SR Neutron Flux Startup (Functional Unit 6.A) in TS Table 3.3-1, "Reactor Trip System Instrumentation," with the following:

ACTION 4 - With the number of channels OPERABLE:

a. One less than required by the Minimum Channels OPERABLE requirement, immediately suspend operations involving positive reactivity additions**.

b. Two less than required by the Minimum channels OPERABLE requirement, immediately open reactor trip breakers.

**Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

Add new Action 7 to TS Table 3.3-1, Reactor Trip System Instrumentation," that will be applied to new Functional Unit 6.C (SR Neutron Flux – Shutdown) to provide direction for Actions for when SR channels are inoperable in Modes 3, 4 and 5 for the condition when the RTBs are closed and control rods are capable of being withdrawn.

ACTION 7 – With the number of channels OPERABLE:

a. One less than required by the Minimum Channels OPERABLE requirement:

   1. Restore the channel to OPERABLE status within 48 hours or

   2. Initiate action to fully insert all rods within 48 hours and place the Control Rod Drive System in a condition incapable of rod withdrawal within the next hour.

b. Two less than required by the Minimum Channels OPERABLE requirement immediately open reactor trip breakers

Attachment 2 of this enclosure includes TS Bases changes for information only. Changes to the TS Bases will be incorporated in accordance with Unit 1 TS 6.17 and Unit 2 TS 6.16, "Technical Specifications (TS) Bases Control Program."

3.0 TECHNICAL EVALUATION

Description of the Nuclear Instrumentation System

Per the Salem Updated Final Safety Analysis Report (UFSAR), the Nuclear Instrumentation System (NIS) is designed to provide continuous overlapping ranges of neutron flux monitoring from shutdown, through startup/power ascension and reactor power operations via the Source, Intermediate and Power Range neutron flux instruments. The core neutron flux spans several decades in level; therefore, monitoring with several ranges of instrumentation is necessary. Each range of instrumentation (source, intermediate, and power) is specifically designed to monitor the leakage neutron flux in that particular range and provides primary or redundant overpower reactor trip protection during operation in that range. The overlap of instrument ranges provides reliable continuous protection beginning with source level through the intermediate and low power level from a completely shutdown condition to 120 percent of full power. The lowest range (Source Range) covers seven decades of leakage neutron flux. The next range (Intermediate Range) covers ten decades. Detectors and instrumentation are chosen to provide overlap between the higher portion of the Source Range and the lower portion of the Intermediate Range. The highest range of instrumentation (Power Range - PR) covers approximately two decades of the total NIS instrumentation range. This is a linear range that overlaps with the higher portion of the Intermediate range.

As reactor power is increased during startup, the overpower protection level is increased by operating procedures, and low power trip protection is manually blocked after satisfactory higher range instrumentation operation is obtained. Automatic reset to more restrictive trip protection setpoints is provided when reducing power.

The IR system provides a reactor trip when one out of the two IR channels reads above the trip setpoint. Per Updated Final Safety Analysis Report (UFSAR) Section 15.2.1, the IR Neutron Flux trip Function provides additional protection against an uncontrolled Rod Cluster Control Assembly (RCCA) bank rod withdrawal accident from a subcritical condition during startup. The IR trip function provides redundant protection to the Power Range Neutron Flux - Low Setting trip. Above the P-10 setpoint, the PR Neutron Flux - High Setting trip provides core protection for an RCCA bank withdrawal accident. In MODE 2, below the P-6 setpoint, the SR Neutron Flux Trip provides redundant core protection for reactivity accidents in parallel with the PR Neutron Flux – Low Setting trip Function.

The IR and SR Neutron Flux trip Functions provide defense in depth protection from over power events during startup and are not credited in any accident or transient analyses in Chapter 15 of the Salem UFSAR. Only the PR Neutron Flux – Low Setting trip Function is credited for overpower protection in the ranges of startup monitored by the SR and IR channels. Those reactor trips that are credited in Chapter 15 of the UFSAR are detailed in PSEG's June 2, 2015 letter to the NRC providing supplemental information regarding the replacement of the Source and Intermediate Range Neutron Monitor Systems (Reference 6.2).

The IR neutron flux trip is designed to be manually blocked if two out of four PR channels are above the P-10 setpoint which is approximately 10 percent of rated thermal power (RTP). During power reduction, when three out of four PR channels are indicating below this value, the IR trip function is automatically reinstated.

The SR neutron flux trip is designed to be manually blocked if any one of the two IR channels is above the P-6 setpoint which is 4.7×10^{-6} % RTP. The SR neutron flux is automatically re-instated when both IR channels indicate below the P-6 setpoint. The SR trip function is automatically blocked whenever two out of four PR channels indicate above the P-10 setpoint.

Proposed Changes to Salem TS for IR and SR Neutron Flux Channels

The proposed changes to the Salem TS are associated with the design and operation of the reactor trip system functions associated with the Intermediate Range (IR) and Source Range (SR) neutron flux channels. The changes are to the following Applicable Modes and Action statements associated with TS Table 3.3-1 for Functional Unit 5 (Intermediate Range Neutron Flux) and Functional Unit 6 (Source Range Neutron Flux):

1. Change to Applicable Modes for Functional Unit 5 (IR) and Functional Unit 6 (SR) of TS Table 3.3-1

   Mode 1 Applicability for IR Neutron Flux Channels

   The existing TS requires the IR channels to be OPERABLE in Mode 1 up to and including full power operation, a range for which the IR channels are not intended to monitor and provide over power protection. Limiting the IR Mode 1 applicability to below the P-10 interlock is consistent with the UFSAR described design of the IR instrument channels. In MODE 1 below the P-10 setpoint, when there is a potential

for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the IR Neutron Flux trip must be OPERABLE as a redundant trip function to the PR Neutron Flux – Low Setting trip function.

The Mode 1 applicability for the IR Function is modified to be applicable below P-10 by adding a superscript "(a)" to Functional Unit 5 in the Applicable Modes column of TS Table 3.3-1 that describes the Mode 1 applicability. The proposed change is consistent with NUREG-1431.

The IR trip function is not credited to mitigate any accident or transient described in Chapter 15 of the Salem UFSAR. Therefore, limiting the Applicability within Mode 1 as proposed does not affect the current design basis.

Mode 2 Applicability for IR Neutron Flux Channels

The existing TS requires the IR channels to be OPERABLE in Mode 2. The IR neutron flux trip function is not required in Mode 2 below the P-6 setpoint because the SR channels provide monitoring and redundant over power protection in Mode 2 (from initial startup to the P-6 setpoint). The current TS Mode 2 applicability for the IR channels below the P-6 setpoint is overly conservative with respect to the design of the IR channels. In Mode 2 above the P-6 setpoint, the IR Neutron Flux trip is required to be OPERABLE as a redundant trip function to the PR Neutron Flux – Low Setpoint trip function.

The Mode 2 applicability for the IR trip function is modified to be applicable above the P-6 setpoint by adding a superscript "(b)" to the Functional Unit 5 Applicable Modes column of TS Table 3.3-1 that describes the Mode 2 applicability. The proposed change is consistent with NUREG-1431.

The IR trip function is not credited to mitigate any accident or transient described in Chapter 15 of the Salem UFSAR. Therefore, limiting the range of applicability within Mode 2 as proposed does not affect the current design basis.

Applicability for IR Neutron Flux Channels with Reactor Trip System Breakers in Closed Position and Control Rod Drive System Capable of Rod Withdrawal

In addition to Modes 1 and 2, the existing TS requires the IR channels be OPERABLE during conditions with the reactor trip breakers (RTBs) in the closed position and the control rod drive system (CRDS) capable of rod withdrawal. This specified condition of Applicability is proposed to be removed from Functional Unit 5. Given the proposed changes described above to define Mode 1 and Mode 2 applicabilities for the IR function for operation below the P-10 setpoint and above the P-6 setpoint respectively, the required range of operation of the IR channels is clearly bounded during operation when the RTBs are closed and the CRDS is capable of rod withdrawal. For power levels below the P-6 setpoint, the SR channels provide the necessary overpower protection in parallel with the PR Neutron Flux – Low Setting trip function and the IR trip function is not required. Similarly, above the P-10 setpoint, the IR channels are not required for over power protection. Therefore, the need for the asterisk in the Applicable Modes column is unnecessary.

Mode 2 Applicability for SR Neutron Flux Functional Unit 6.A (Startup)

The existing TS requires the SR reactor trip function to be OPERABLE in Mode 2. The SR reactor trip function provides over power protection from shutdown conditions up to the lower range of flux monitored by the IR channels. The SR trip function is designed to be manually blocked once any one of the two IR channels is indicating greater than the P-6 setpoint which is set at a value ensuring overlap between the SR and IR channels.

In Mode 2 above the P-6 setpoint, the IR channels provide redundant over power protection. The proposed change to the Startup Mode for the SR channels in TS Table 3.3-1 provides an upper bound of the P-6 power level in Mode 2 for SR channel operability which is consistent with its design and operation. The SR trip function is redundant to both the IR reactor trip and PR – Low Setting trip functions.

The Mode 2 applicability for SR trip function in Startup is modified to be applicable below the P-6 setpoint by adding a superscript "(c)" to TS Table 3.3-1 that describes the applicability. The proposed change is consistent with NUREG-1431.

The SR trip function is not credited to mitigate any accident or transient described in Chapter 15 of the Salem UFSAR. Therefore, limiting the range of applicability within Mode 2 as proposed does not affect the current design basis.

Applicability for SR Neutron Flux Functional Unit 6.A (Startup) with Reactor Trip System Breakers in the Closed Position and Control Rod Drive System Capable of Rod Withdrawal

In addition to Mode 2, the existing TS requires Functional Unit 6.A (SR Neutron Flux – Startup) to be OPERABLE when RTBs are closed and the control rod drive system (CRDS) is capable of rod withdrawal. This specified condition of Applicability, identified as an asterisk note in the Applicable Modes column for Functional Unit 6.A is proposed to be moved to a new Functional Unit 6.C (SR Neutron Flux – Shutdown). The new Functional Unit 6.C is consistent with NUREG-1431 and provides greater clarity for SR trip function operability in Modes 3, 4 and 5 than the current asterisk note considering the design basis for the SR system and the above proposed change to limit Mode 2 applicability to power levels below P-6.

TS Table 3.3-1, New Functional Unit 6.C – SR Neutron Flux Trip, Shutdown Modes 3, 4 and 5

The proposed addition of Functional Unit 6.C (SR Neutron Flux – Shutdown) to TS Table 3.3-1 provides explicit requirements for SR channel requirements that were implied in the asterisk note in the Applicable Modes column in the current TS for Functional Unit 6.A. Providing a separate line item for SR channel requirements for Modes 3, 4 and 5 whenever RTBs are closed and the CRDS is capable of rod withdrawal provides a more explicit description of mode applicability for SR trip operability whenever reactivity additions via rod withdrawal can occur during Shutdown. The proposed change maintains the same channel operability requirements established by the asterisk note that is applied to current TS Functional Unit 6.A and is in alignment with NUREG-1431 for the SR trip function in Shutdown/Hot Standby modes.

2. Change to Action 3 in TS Table 3.3-1

Action 3 of TS Table 3.3.1 currently does not provide direction in the event both IR channels are inoperable, thus requiring entry into TS Action 3.0.3 to place the unit in a MODE in which the specification does not apply. The proposed new TS Table 3.3-1 Action 3.b provides direction for the condition where both IR channels are inoperable. The direction calls for immediate suspension of positive reactivity additions and reducing THERMAL POWER to below the P-6 setpoint within two hours. The allowed outage time will allow a slow and controlled power reduction to less than the P-6 setpoint and takes into account the low probability of occurrence of an event during this period that may require the protection afforded by the IR Neutron Flux trip. Once below the P-6 setpoint, redundant core overpower protection is afforded by the SR trip function. The proposed Action 3.b provides an allowance for normal plant control operations that add limited positive reactivity (boron dilution and reactor cooldown) as long as these are factored into the SHUTDOWN MARGIN calculation.

The proposed change provides more direct and expeditious guidance to place the reactor in a condition where the need for IR protection is not applicable (i.e. below P-6) than the current required action enforced by TS 3.0.3. The proposed Action for both IR channels being inoperable is consistent with the design basis of the IR trip function and with the Required Action described in NUREG-1431 for the condition of two inoperable IR channels.

Additional changes to Action 3 of TS Table 3.3-1 are proposed to provide improved direction and increased operational flexibility for the condition when one of the two required IR channels is inoperable. Action 3.a covers the entry condition when THERMAL POWER is below the P-6 setpoint. The action requires the inoperable IR channel be restored to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint; the point at which the trip function of the IR channels is required.

Similarly, ACTION 3.b covers the entry condition when THERMAL POWER is above the P-6 setpoint. Entry into ACTION 3.b limits power ascension activities to below 5% of RATED THERMAL POWER until the inoperable IR channel is restored to OPERABLE status.

The proposed change to Action 3 in TS Table 3.3-1 provides the option to either reduce THERMAL POWER to below the P-6 setpoint (the power level at which the SR trip is automatically active) within 24 hours or increase power to above the P-10 setpoint (the power level at which the IR trip function can be manually blocked) within 24 hours. Power ascension (or descension) activities do not have to be placed on hold until the IR channel is returned to OPERABLE status as currently required in the existing ACTION statements.

This proposed revision to ACTION 3 takes into account the design basis of the IR trip function and the power levels within modes 1 and 2 where the IR trip provides additional protection from potential overpower conditions. The IR Neutron Flux trip Function provides protection against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function is redundant to the protection provided by the Power Range Neutron Flux - Low Setting trip Function

that is credited in the UFSAR Chapter 15 accident analyses. The flexibility to move reactor power below P-6 provided in the proposed change to TS Table 3.3-1 Action 3.a.1 recognizes that the credited PR flux trip function is still available as well as the remaining IR neutron flux trip channel which itself is capable of initiating a reactor trip given its one-out-of-two trip logic.

Once below the P-6 setting, reactor power is below the power value covered by the IR trip function and the SR neutron flux trip function provides the redundant over-power protection to the PR Low Setting trip Function. The 24 hour allowed outage time provides for controlled transitioning below P-6 and takes into account the redundant capability afforded by the PR trip channels and by the redundant OPERABLE IR channel and the low probability of its failure during the transition to below P-6.

Similarly, the proposed new TS Table 3.3-1 Action 3.a.2 provides flexibility to increase reactor power above the P-10 setpoint where the IR neutron flux trip function can be manually blocked. Once above the P-10 setpoint, the PR Neutron Flux - High Setting trip provides the core protection credited in the UFSAR Chapter 15 accident analyses for a rod withdrawal accident. The flexibility provided in Action 3.a in TS Table 3.3-1 to allow increasing power above P-10 with one inoperable IR trip channel is premised on the credited reactor trip functions still available from the PR channels as well as the trip function available from the remaining IR trip channel. The 24 hour allowed outage time provides for a slow and controlled power adjustment above P-10, recognizing the redundant capability afforded by the PR trip channels and by the redundant OPERABLE IR channel and the low probability of its failure during the power transition to above the P-10 value.

In summary, the proposed changes to TS ACTION 3 provides guidance that is currently lacking in the Salem TS for the condition where both IR channels are inoperable and provides actions that are more appropriate than those directed by TS 3.0.3 and more reflective of the design basis of the IR trip function. The changes also reflect the above described range of power where the IR channels are designed to provide overpower protection. Lastly, the proposed changes to TS Table 3.3-1 Action 3 are also consistent with NUREG-1431.

3. Change to Action 4 in TS Table 3.3-1

Similar to the proposed changes to TS Table 3.3-1 Action 3, the proposed changes to Action 4 for SR channels in Startup Mode provide direction for the condition where both SR channels are inoperable that is lacking in the current Salem TS and provide directions for channel inoperability that better reflect the design basis of the SR trip function.

The proposed change to TS Table 3.3-1 Action 4.a directs the immediate suspension of positive reactivity additions whenever one of the two required SR channels is inoperable while in Mode 2 below the P-6 setpoint. A note is provided that allows for limited plant cooldown or boron dilution provided the change in reactivity is accounted for in the SHUTDOWN MARGIN calculation. The suspension of positive reactivity additions prevents any escalation of power and reduces the potential for an uncontrolled RCCA bank rod withdrawal accident that would require mitigation.

The allowance in Action 4.a for reactivity increases resulting from boron dilution and reactor cooldown as long as these are factored into the SHUTDOWN MARGIN calculation accommodates minor, anticipated reactivity changes during the channel restoration period while ensuring there is limited impact on reactor power or the shutdown status of the plant. There is no time constraint while in this state to restore the inoperable SR channel given the availability of the remaining OPERABLE SR channel as well as the credited parallel protection provided by the PR Low Setting trip channels.

When below P-6, the current TS Action requires the restoration of the inoperable SR channel prior to increasing the power to above P-6; above P-6, operation (i.e. power ascension) may continue. The proposed Action 4.a is conservative relative to the trip protection function of the SR system in Startup below the P-6 power level.

A second proposed change to TS Table 3.3-1 Action 4 provides an action statement 4.b for the condition where both SR channels are inoperable while in STARTUP and less than the P-6 setpoint; a condition that is not addressed in the current TS Action 4. The proposed change requires immediate opening of the reactor trip breakers, thus causing an immediate insertion of any withdrawn control rods, placing the core in a more stable condition and removing the potential for any reactivity transient resulting from RCCA bank withdrawal that would require mitigation. The current lack of a TS action for two inoperable SR channels forces the plant into TS 3.0.3 and its associated time frames for lowering reactor power to a COLD SHUTDOWN condition. The proposed Action 4.b provides more direct, conservative direction than the current need to enter TS 3.0.3.

The proposed changes to Action 4 take into account the overall design basis of the SR trip function and are consistent with NUREG-1431.

4. Addition of new Action 7 to TS Table 3.3-1

The proposed change to TS Table 3.3-1 to add a new Action 7 to align with new TS Functional Unit 6.C for the SR Neutron Flux trip function in Modes, 3, 4 and 5 with the RTBs in the closed position and the CRDS capable of rod withdrawal provides direction for one or both SR channels being inoperable during plant conditions with the potential to withdraw control rods. Similar to TS Table 3.3-1 Action 4, there is no current TS Action described for the case where both SR trip channels are inoperable while in Modes 3, 4 and 5 with rod withdrawal capability enabled.

With one SR trip channel inoperable, the proposed Action 7 requires the inoperable channel be restored to OPERABLE status within 48 hours or, as an alternate action, insert all rods within 48 hours and place the Control Rod Drive system in a condition incapable of rod withdrawal within the next hour. This action and its associated time frames reflect the operability of the remaining SR trip channel. The proposed change is more conservative than the current Action 4 which does not limit the time to restore the inoperable SR channel to OPERABLE status.

Similar to the above proposed change to Action 4, the proposed Action 7 will also add direction for the condition where both SR channels are inoperable in Modes 3, 4 and 5 with the RTBs closed and the CRDS capable of rod withdrawal. This condition is not currently addressed as part of the Action 4 associated with the asterisk

condition in the Applicable Modes column of TS Table 3.3-1 for Functional Unit 6.a. The proposed Action requires the RTBs to be opened immediately which results in the automatic insertion of any withdrawn control rods thus placing the unit in a more stable condition. The proposed new Action 7 is aligned with NUREG-1431 for the SR trip function in modes 3, 4 and 5 with the capability of rod withdrawal.

5. TS Index Revision

   The proposed change to the TS Index for both Unit 1 and Unit 2 identifies a new Bases page number that is required to accommodate newly added Bases text to reflect the above changes to the SR and IR instruments.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50, Appendix A, General Design Criteria (GDC)

Salem was designed in accordance with Atomic Energy Commission (AEC) proposed General Design Criteria published in July 1967. The applicable AEC proposed criteria, as document in Salem UFSAR Section 3.1, were compared to 10 CFR 50 Appendix A General Design Criteria (GDC) as discussed below. The applicable GDC criteria are GDC 10, 13, 20, 21, and 29.

Criterion 10—Reactor design. The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

GDC Criterion 10 is similar to AEC Criterion 6 and 31.

Criterion 13—Instrumentation and control. Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

GDC Criterion 13 is similar to AEC Criterion 12.

Criterion 20—Protection system functions. The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

GDC Criterion 20 is similar to AEC Criterion 14 and 15.

Criterion 21—Protection system reliability and testability. The protection system shall be designed for high functional reliability and inservice testability commensurate with the safety functions to be performed. Redundancy and independence designed into the protection system shall be sufficient to assure that (1) no single failure results in loss of the protection function and (2) removal from service of any component or channel does not result in loss of the required minimum redundancy unless the acceptable reliability of operation of the protection system can be otherwise demonstrated. The protection system shall be designed to permit periodic testing of its functioning when the reactor is in operation, including a capability to test channels independently to determine failures and losses of redundancy that may have occurred.

GDC Criterion 21 is similar to AEC Criterion 19 and 20.

Criterion 29— Protection against anticipated operational occurrences. The protection and reactivity control systems shall be designed to assure an extremely high probability of accomplishing their safety functions in the event of anticipated operational occurrences.

GDC Criterion 29 is similar to AEC Criterion 19 and 23.

Following implementation of the proposed changes, Salem Units 1 and 2 will remain in compliance with AEC Criterion 6, 12, 14, 15, 19, 20, 23 and 31.

In 10 CFR 50.36, "Technical specifications," the Commission established its regulatory requirements related to the content of the TSs. Pursuant to 10 CFR 50.36, TSs are required to include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements; (4) design features; and (5) administrative controls. Based on the assessments presented herein, the proposed change to the Salem TS has no significant impact on the continued conformance with the requirements of 10 CFR 50.36.

10 CFR 50.90, "Application for amendment of license or construction permit," addresses the requirements for a licensee desiring to amend its license and the TS incorporated therein. This license amendment request to change the Actions and Applicable Modes for Functional Units 5 and 6 in TS Table 3.3-1 has been prepared to meet the requirements of 10 CFR 50.90. Following implementation of the proposed changes, Salem will remain in compliance with the above regulations and guidance.

4.2 Precedent

The proposed changes are consistent with NUREG-1431. The following individual precedent exists relative to changes proposed for the IR neutron flux trip function:

- In a letter from the NRC to Virginia Electric Power dated July 30, 1997, License Amendment Nos. 206 and 187 were approved for North Anna Units 1 and 2 respectively. The License Amendments approved a change to the IR Reactor Trip Setpoint and a change to the range of applicability for IR operability in Mode 1 (ADAMS Accession No. ML013510452).

4.3 No Significant Hazards Consideration

The applicable modes and actions for Salem Generating Station Technical Specification (TS) Limiting Condition of Operability (LCO) 3.3.1.1, Table 3.3-1 Functional Unit 5 (Intermediate Range (IR) Neutron Flux) and Functional Unit 6 (Source Range (SR) Neutron Flux) are revised to address the condition where either both IR or SR channels are inoperable. The proposed changes also align the modes and actions associated with these Functional Units to be more consistent with the SR and IR trip function design bases and NUREG-1431 – Standard Improved Technical Specifications – Westinghouse Plants.

PSEG has evaluated the proposed changes to the TS using the criteria in 10 CFR 50.92, and determined that the proposed changes do not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed changes to the TS will not alter the way any structure, system, or component (SSC) functions, and will not alter the manner in which the plant is operated. The proposed changes do not alter the design of any SSC. The Nuclear Instrumentation System is not an accident initiator. Therefore, the probability of an accident previously evaluated is not significantly increased.

   The proposed changes align the TS with the design bases for the SR and IR trip functions. The Power Range (PR) Neutron Flux trip function is the only Nuclear Instrumentation System trip credited in the Salem safety analyses. The proposed change has no impact to any PR Neutron Flux trip functions, therefore the consequences of an accident previously evaluated are not increased.

   Therefore, these proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The proposed changes do not involve a modification to the physical configuration of the plant or changes in the methods governing normal plant operation. The proposed changes do not impose any new or different requirements or introduce a new accident initiator, accident precursor, or mechanism for equipment malfunction.

   Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

   Response: No

   The proposed changes to the TS impose requirements that are consistent with assumptions in the design basis safety analyses. The proposed changes will not result in changes to system design or setpoints that are credited in the safety analyses. The proposed changes do not impact systems or indications intended to ensure timely identification of plant conditions that could be precursors to accidents or potential degradation of accident mitigation systems.

   The proposed amendment will not result in a design basis or safety limit being exceeded or altered. Therefore, since the proposed changes do not impact the analyzed response of the plant to a design basis accident, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the above, PSEG concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 CONCLUSIONS

Therefore, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Letter from NRC to Virginia Electric Power dated July 30, 1997, License Amendment Nos. 206 and 187 for North Anna Units 1 and 2 respectively for a change to the IR Reactor Trip Setpoint and a change to the range of applicability for IR operability in Mode 1 (ADAMS Accession No. ML013510452).

2. Letter from PSEG to NRC dated June 2, 2015, "Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment Request Regarding Replacement of Source Range and Intermediate Range Neutron Monitoring Systems (TAC Nos. MF6065 and MF6066)" (ADAMS Accession No. ML15153A193)

3. NUREG-1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0, April 2012.

Attachment 1

Mark-up of Proposed Technical Specification Pages

The following Technical Specifications pages for Renewed Facility Operating License DPR-70 are affected by this change request:

Technical Specification	Page
INDEX – Bases Section 3/4.3.3, Monitoring Instrumentation	XII
3/4.3.1, Reactor Trip System Instrumentation	3/4 3-2, 3-5, 3-6

The following Technical Specifications pages for Renewed Facility Operating License DPR-75 are affected by this change request:

Technical Specification	Page
INDEX – Bases Section 3/4.3.3, Monitoring Instrumentation	XII
3/4.3.1, Reactor Trip System Instrumentation	3/4 3-2, 3-5, 3-6

Technical Specification Mark-Up Inserts for Salem Unit 1 and Unit 2

INSERT-A (TS Table 3.3-1 Action 3)

With the number of channels OPERABLE:

a. One less than required by the Minimum Channels OPERABLE requirement

   1. Reduce THERMAL POWER to < P-6 within 24 hours or,

   2. Increase THERMAL POWER to > P-10 within 24 hours.

b. Two less than required by the Minimum Channels OPERABLE requirement

   1. Immediately suspend operations involving positive reactivity additions** and,

   2. Reduce THERMAL POWER to < P-6 within 2 hours.

INSERT-B (TS Table 3.3-1 Action 4)

With the number of channels OPERABLE:

a. One less than required by the Minimum Channels OPERABLE requirement, immediately suspend operations involving positive reactivity additions**.

b. Two less than required by the Minimum channels OPERABLE requirement, immediately open reactor trip breakers.

INSERT-C (TS Table 3.3-1 Action 7)

With the number of channels OPERABLE:

a. One less than required by the Minimum Channels OPERABLE requirement:

   1. Restore the channel to OPERABLE status within 48 hours or

   2. Initiate action to fully insert all rods within 48 hours and place the Control Rod Drive System in a condition incapable of rod withdrawal within the next hour.

b. Two less than required by the Minimum Channels OPERABLE requirement immediately open reactor trip breakers.

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TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NUMBER OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2 and *	12
2. Power Range, Neutron Flux	4	2	3	1, 2 and 3*	2
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2
4. Deleted					
5. Intermediate Range, Neutron Flux	2	1	2	1, 2 and *	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2 and *	4
B. Shutdown	2	0	1	3, 4 and 5	5
7. Overtemperature ΔT	4	2	3	1, 2	6
8. Overpower ΔT	4	2	3	1, 2	6
9. Pressurizer Pressure-Low	4	2	3	1, 2	6
10. Pressurizer Pressure--High	4	2	3	1, 2	6
C. Shutdown	2	1	2	3*, 4* and 5*	7

TABLE 3.3-1 (Continued)

TABLE NOTATION

**Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

\# Above the P-9 (Power Range Neutron Flux) interlock.

If ACTION Statement 1 is entered as a result of Reactor Trip Breaker (RTB) or Reactor Trip Bypass Breakers (RTBB) maintenance testing results exceeding the following acceptance criteria, NRC reporting shall be made within 30 days in accordance with Specification 6.9.2:

1. A RTB or RTBB trip failure during any surveillance test with less than or equal to 300 grams of weight added to the breaker trip bar.

2. A RTB or RTBB time response failure that results in the overall reactor trip system time response exceeding the Technical Specification limit.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel (RTB) to OPERABLE within 24 hours or be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1.1.

c. Either, THERMAL POWER is restricted to ≤ 75% of RATED THERMAL POWER and the Power Range, Neutron Flux trip setpoint is reduced to ≤ 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours.

(a) Below the P-10 (Power Range Neutron Flux) interlocks
(b) Above the P-6 (Intermediate Range Neutron Flux) interlocks
(c) Below the P-6 (Intermediate Range Neutron Flux) interlocks

Replace with Insert-A

TABLE 3.3-1 (Continued)

ACTION 3 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:~~

~~a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

~~b. Above P-6 but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.~~

Replace with Insert-B

~~c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.~~

ACTION 4 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:~~

~~a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

~~b. Above P-6, operation may continue.~~

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

Replace with Insert-C

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

ACTION 7 - ~~NOT USED~~

ACTION 8 - NOT USED

ACTION 9 - NOT USED

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TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NUMBER OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2 and *	12
2. Power Range, Neutron Flux	4	2	3	1, 2 and 3*	2
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2
4. Deleted				(a) (b)	
5. Intermediate Range, Neutron Flux	2	1	2	1, 2 ~~and *~~	3
6. Source Range, Neutron Flux				(c)	
A. Startup	2	1	2	2 ~~and *~~	4
B. Shutdown	2	0	1	3, 4 and 5	5
7. Overtemperature ΔT	4	2	3	1, 2	6
8. Overpower ΔT	4	2	3	1, 2	6
9. Pressurizer Pressure-Low	4	2	3	1, 2	6
10. Pressurizer Pressure--High	4	2	3	1, 2	6
C. Shutdown	2	1	2	3*, 4* and 5*	7

** Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

\# Above the P-9 (Power Range Neutron Flux) interlock.

If ACTION Statement 1 is entered as a result of Reactor Trip Breaker (RTB) or Reactor Trip Bypass Breaker (RTBB) maintenance testing results exceeding the following acceptance criteria, NRC reporting shall be made within 30 days in accordance with Specification 6.9.2:

1. A RTB or RTBB trip failure during any surveillance test with less than or equal to 300 grams of weight added to the breaker trip bar.

2. A RTB or RTBB time response failure that results in the overall reactor trip system time response exceeding the Technical Specification limit.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel (RTB) to OPERABLE within 24 hours or be in HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1.1.

c. Either, THERMAL POWER is restricted to ≤ 75% of RATED THERMAL POWER and the Power Range, Neutron Flux trip setpoint is reduced to ≤ 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours.

d. The QUADRANT POWER TILT RATIO, as indicated by the remaining three detectors, is verified consistent with the normalized symmetric power distribution obtained by using either the movable in-core detectors in the four pairs of symmetric thimble locations or the power distribution monitoring system at least once per 12 hours when THERMAL POWER is greater than 75% of RATED THERMAL POWER.

(a) Below the P-10 (Power Range Neutron Flux) interlocks
(b) Above the P-6 (Intermediate Range Neutron Flux) interlocks
(c) Below the P-6 (Intermediate Range Neutron Flux) interlocks

Replace with Insert-A

TABLE 3.3-1 (Continued)

ACTION 3 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:~~

~~a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

~~b. Above P-6, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.~~

~~c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.~~

~~d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.~~

Replace with Insert-B

ACTION 4 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:~~

~~a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

~~b. Above P-6, operation may continue.~~

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

b. The Minimum Channel OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

Replace with Insert-C

ACTION 7 - ~~NOT USED~~

ACTION 8 - NOT USED

ACTION 9 - NOT USED

Attachment 2

Mark-up of Proposed Technical Specification Bases Pages
For Information Only

The following Technical Specifications Bases pages for Renewed Facility Operating License DPR-70 are affected by this change request:

Technical Specification	Page
3/4.3.1, Reactor Trip System Instrumentation	B 3/4 3-1b

The following Technical Specifications Bases pages for Renewed Facility Operating License DPR-75 are affected by this change request:

Technical Specification	Page
3/4.3.1, Reactor Trip System Instrumentation	B 3/4 3-1b

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of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types, and other components that do not have plant-specific NRC approval to use alternate means of verification, must be demonstrated by test. The allocation for sensor response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. One example where response time could be affected is replacing the sensing assembly of a transmitter.

Channel testing in a bypassed condition shall be performed without lifting leads or jumpering bistables.

The CHANNEL CALIBRATION surveillance for the Power Range Neutron Flux Function instrumentation is modified by Note 17. Note 17 states that in MODES 1 and 2 the SSPS input relays are excluded from this Surveillance when the installed bypass test capability is used to perform this surveillance. When the installed bypass test capability is used, the channel is tested in bypass versus tripped condition. To preclude placing the channel in a tripped condition, the SSPS input relays are excluded from this surveillance. The exclusion of the SSPS input relays from this test is intended to reduce the potential for an inadvertent reactor trip during surveillance testing. Therefore, the exclusion of the SSPS input relays from the surveillance is only applicable in MODES 1 and 2. The SSPS input relays must be included in the CHANNEL CALIBRATION surveillance at least once every 18 months.

The CHANNEL FUNCTIONAL TEST surveillances for the Power Range Neutron Flux and Power Range Neutron Flux High Positive Rate Function Instrumentation are modified by Note 18. Note 18 states that the SSPS input relays are excluded from this surveillance when the installed bypass test capability is used to perform this surveillance. When the installed bypass test capability is used, the channel is tested in a bypassed versus tripped condition. To preclude placing the channel in a tripped condition, the SSPS input relays are excluded from this surveillance. The exclusion of the SSPS input relays from this test is intended to reduce the potential for an inadvertent reactor trip during surveillance testing. The SSPS input relays must be included in the CHANNEL CALIBRATION surveillance at least once every 18 months.

Bases Insert

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

In the postulated Fuel Handling Accident, the revised dose calculations, performed using 10 CFR 50.67 and Regulatory Guide 1.183, Alternative Source Term, do not take credit for automatic containment purge isolation thus allowing for continuous monitoring of containment activity until containment closure is achieved. If required, containment purge isolation can be initiated manually from the control room.

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measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types, and other components that do not have plant-specific NRC approval to use alternate means of verification, must be demonstrated by test.

The allocation for sensor response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. One example where response time could be affected is replacing the sensing assembly of a transmitter.

Channel testing in a bypassed condition shall be performed without lifting leads or jumpering bistables.

The CHANNEL CALIBRATION surveillance for the Power Range Neutron Flux Function instrumentation is modified by Note 17. Note 17 states that in MODES 1 and 2 the SSPS input relays are excluded from this surveillance when the installed bypass test capability is used to perform this surveillance. When the installed bypass test capability is used, the channel is tested in bypass versus tripped condition. To preclude placing the channel in a tripped condition, the SSPS input relays are excluded from this surveillance. The exclusion of the SSPS input relays from this test is intended to reduce the potential for an inadvertent reactor trip during surveillance testing. Therefore, the exclusion of the SSPS input relays from the surveillance is only applicable in MODES 1 and 2. The SSPS input relays must be included in the CHANNEL CALIBRATION surveillance at least once every 18 months.

The CHANNEL FUNCTIONAL TEST surveillances for the Power Range Neutron Flux and Power Range Neutron Flux High Positive Rate Function Instrumentation are modified by Note 18. Note 18 states that the SSPS input relays are excluded from this surveillance when the installed bypass test capability is used to perform this surveillance. When the installed bypass test capability is used, the channel is tested in a bypassed versus tripped condition. To preclude placing the channel in a tripped condition, the SSPS input relays are excluded from this surveillance. The exclusion of the SSPS input relays from this test is intended to reduce the potential for an inadvertent reactor trip during surveillance testing. The SSPS input relays must be included in the CHANNEL CALIBRATION surveillance at least once every 18 months.

Bases Insert

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

Bases Insert:

The Intermediate Range (IR) Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range (PR) Neutron Flux - Low Setting trip Function. In MODE 1 below the P-10 setpoint, and in MODE 2 above the P-6 setpoint, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the IR Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the PR Neutron Flux - High Setpoint trip function provides core protection for a rod withdrawal accident. In MODE 2 below the P-6 setpoint, the Source Range (SR) Neutron Flux Trip provides core protection for reactivity accidents. In MODE 3, 4, or 5, the IR Neutron Flux trip does not have to be OPERABLE because the control rods must be fully inserted and only the shutdown rods may be withdrawn. The reactor cannot be started up in this condition.

The 24 hour Action times for one inoperable IR channel allow for a slow and controlled power adjustment above P-10 or below P-6 and take into account the redundant capability afforded by the OPERABLE IR channel and its low probability of failure during this period.

If both IR channels are inoperable with THERMAL POWER between P-6 and P-10, immediate suspension of operations involving positive reactivity additions is required due to loss of all IR trip protection. Normal plant control operations that individually add limited positive reactivity (e.g. temperature or boron fluctuations associated with RCS inventory management or temperature control) are allowed by this Action provided they are accounted for in the calculated SHUTDOWN MARGIN. THERMAL POWER must also be reduced to below P-6 within two hours. This Action time will allow a slow and controlled power reduction to less than the P-6 setpoint and takes into account the low probability of occurrence of an event during this period that may require the protection afforded by the IR Neutron Flux trip.

The LCO requirements for the SR Neutron Flux trip Function in Mode 2 ensure that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range Neutron Flux – Low Setting trip Function. In MODE 2 when below the P-6 setpoint, the SR Neutron Flux trip must be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. If one SR channel is inoperable, immediate suspension of operations involving positive reactivity additions is required due to loss of redundancy in the SR trip function. Normal plant control operations that individually add limited positive reactivity (e.g. temperature or boron fluctuations associated with RCS inventory management or temperature control) are allowed by this Action provided they are accounted for in the calculated SHUTDOWN MARGIN. If both SR channels are inoperable, trip protection from reactivity events is compromised and the Reactor Trip Breakers (RTBs) must immediately be opened to place the core in a stable, shutdown condition.

The SR trip function is redundant to the PR Neutron Flux - Low Setting trip Function for over power protection in MODE 3, when RTBs are closed and the Control Rod Drive System (CRDS) is capable of rod withdrawal. In Modes 4 and 5 with RTBs closed and CRDS capable of rod withdrawal, only the SR trip function provides over power protection. These Neutron Flux trip functions provide over power protection for control rod withdrawal from subcritical. If one SR channel is inoperable, within 48 hours either restore the inoperable SR channel to OPERABLE status or initiate actions to fully insert all control rods and place the CRDS in a condition incapable of rod withdrawal within the following hour. If both SR channels are inoperable, the RTBs must immediately be opened to place the core in a stable, shutdown condition. In MODES 3, 4, and 5 with RTBs open and the CRDS incapable of rod withdrawal, the trip function of the SR or PR channels are not required to be OPERABLE and the SR channels provide flux monitoring functions only.