Florida Power & Light, 9760 S.W. 344 St. Homestead, FL 33035

FPL.

AUG 29 2011
L-2011-302
10 CFR 50.90

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to NRC RAI Regarding EPU LAR No. 205
Technical Specification and Instrumentation and Control Issues

References:

(1) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request for Extended Power Uprate (LAR 205)," Accession No. ML103560169, October 21, 2010.

(2) Technical Specification Task Force (TSTF) Change Traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS Functions," July 31, 2009.

By letter L-2010-113 dated October 21, 2010 [Reference 1], Florida Power and Light Company (FPL) requested to amend Renewed Facility Operating Licenses DPR-31 and DPR-41 and revise the Turkey Point Units 3 and 4 Technical Specifications (TS). The proposed amendment will increase each unit's licensed core power level from 2300 megawatts thermal (MWt) to 2644 MWt and revise the Renewed Facility Operating Licenses and TS to support operation at this increased core thermal power level. This represents an approximate increase of 15% and is therefore considered an extended power uprate (EPU).

On July 20, 2011, a telephone conference call was held between the U.S. Nuclear Regulatory Commission (NRC) Project Manager (PM), the NRC Technical Specification Branch (ITSB) reviewers, and representatives from the EPU project and Westinghouse to discuss the EPU proposed changes to the TS related to the partial implementation of TSTF-493 [Reference 2]. As a result of the conference call, FPL agreed to submit additional changes to TS Tables 2.2-1, 3.3-3, 4.3-1, and 4.3-2 related to the implementation of TSTF-493 requirements. These additional TS changes withdraw the proposed annotation of Footnotes (a) and (b) in TS Tables 2.2-1 and 3.3-3 and revise the proposed Footnote (b) in TS Tables 4.3-1 and 4.3-2. The TS changes are provided in the Attachment to this letter.

For clarity, FPL is submitting a complete package of the Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) proposed technical specification changes including changes proposed in LAR 205, subsequent changes as a result of NRC review, and the additional changes from the conference call noted above.

The Turkey Point Plant Nuclear Safety Committee (PNSC) has reviewed the proposed amendments. In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the State Designee of Florida..

A001
NRR

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-113 [Reference 1].

This submittal contains no new commitments and no revisions to existing commitments

Should you have any questions regarding this submittal, please contact Mr. Robert J. Tomonto, Licensing Manager, at (305) 246-7327.

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

Executed on August 29, 2011.

Very truly yours,

Michael Kiley
Site Vice President
Turkey Point Nuclear Plant

Attachment

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Resident Inspector, Turkey Point Nuclear Plant
Mr. W. A. Passetti, Florida Department of Health

Turkey Point Units 3 and 4

RESPONSE TO NRC COMMENTS REGARDING EPU LAR NO. 205
ITSB TECHNICAL SPECIFICATION AND
INSTRUMENTATION AND CONTROL ISSUES

ATTACHMENT

Response to Request for Additional Information

The following information is provided by Florida Power & Light Company (FPL) in response to technical comments received from the U. S. Nuclear Regulatory Commission's (NRC) Technical Specification Branch (ITSB). This information was requested to support License Amendment Request (LAR) 205, Extended Power Uprate (EPU), for Turkey Point Nuclear Plant (PTN) Units 3 and 4 that was submitted to the NRC by FPL via letter (L-2010-113) dated October 21, 2010 [Reference 1].

On July 20, 2011, a telephone conference call [Reference 2] was held between the NRC Project Manager (PM), the NRC Technical Specification Branch (ITSB) reviewers, and representatives from the EPU project and Westinghouse to discuss the EPU proposed changes to the Technical Specifications (TS) related to the partial implementation of Technical Specification Task Force (TSTF) Change Traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS Functions" [Reference 3]. As a result of the ITSB conference call, FPL agreed to submit additional changes to TS Tables 2.2-1, 3.3-3, 4.3-1, and 4.3-2. These additional TS changes withdraw the originally proposed annotation of Footnotes (a) and (b) in TS Tables 2.2-1 and 3.3-3 and revise proposed Footnote (b) in TS Tables 4.3-1 and 4.3-2. For clarity, FPL is submitting a complete package of the Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) proposed technical specification changes including changes proposed in LAR 205, subsequent changes as a result of NRC review, and the additional changes from the conference call noted above. These TS changes are documented below.

TS Changes

Technical Specification Table 2.2-1, RTS Instrumentation Trip Setpoints

Current TS (General)

This Technical Specification table contains changes to Nominal Trip Setpoint (NTS) and Allowable Values for RTS setpoints. The NTS values are the Limiting Safety System Setting (LSSS) values that are derived from the analytical values and adjusted to account for the specific instrument uncertainties.

Proposed TS (General)

The TS values for the Nominal Trip Setpoints and Allowable Values are proposed to be changed, as shown in Attachment 2 and described in Sections 3.1.4 through 3.1.12 below, for the following functions:

2.a Power Range Neutron Flux-High Setpoint
5. Overtemperature ΔT—Notes 1 and 2
6. Overpower ΔT—Notes 3 and 4
10. Reactor Coolant Flow-Low
11. Steam Generator Water Level-Low-Low
12. Steam/Feedwater Flow Mismatch Coincident with Steam Generator (SG) Water Level-Low
15.a Turbine Trip-Emergency Trip Header Pressure

Basis for the Change: As defined in 10 CFR 50.36, LSSS are settings for automatic protective devices related to those variables having significant safety functions. 10 CFR 50.36 requires that these limiting settings be included in the Technical Specifications.

The NTS and Allowable Values (AVs) for RTS trip functions in Table 2.2-1 are calculated based on limits from the safety analyses, process limits for the instrumentation, and the instrument loop uncertainties calculated with 95% probability and 95% confidence to industry standard methodology. The methods used to determine the NTS and Allowable Values and summaries of associated calculations are provided WCAP-17070-P, Rev. 1 [Reference 4].

The NTS and AVs proposed for TS Table 2.2-1 are values for the nominal trip setpoint and are calculated such that there is 95% probability and 95% confidence that the trip will occur prior to the process variable exceeding the established limit under EPU conditions. Therefore, the assumptions of the safety analyses and their results are protected by the proposed NTS values.

These NTS and AVs have been evaluated using methods described in EPU Licensing Report (LR) Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems, and WCAP-17070-P, Rev. 1 [Reference 4]. In accordance with TSTF-493 Rev. 4, Option A, Notes (a) and (b) regarding the as-found and as-left tolerances around the NTS are added to the Channel Calibration and analog channel operational test surveillances associated with the above NTS values in TS Table 4.3-1 (Reactor Trip System Instrumentation Surveillance Requirements).

Licensing Report Section: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 2a, Power Range Neutron Flux - High

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
2. Power Range, Neutron Flux a. High Setpoint	≤ 112.0% of RTP**	≤ 109.0% of RTP**

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
2. Power Range, Neutron Flux a. High Setpoint	≤ **108.6%** of RTP**	**108.0%** of RTP**

Basis for the Change: See EPU LAR-205 and FPL letter L-2011-190 [Reference 4].

Licensing Report Sections: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems and LR Section 2.8.5.0, Non-LOCA Analyses Introduction.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 5, Overtemperature ΔT, Notes 1 and 2

Current TS

NOTE 1: OVERTEMPERATURE ΔT

Equation variables are defined as follows:

- $K_1 = 1.24$
- $K_2 = 0.017/^{\circ}F$
- $K_3 = 0.001/psig$
- $T' \leq 577.2\ ^{\circ}F$ (Nominal T_{avg} at RATED THERMAL POWER)
- $\tau_3, = 0$ s
- $\tau_6 = 0$ s

And $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power range neutron ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(1) For $q_t - q_b$ between – 50% and + 2%, $f_1(\Delta I) = 0$, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER;

(2) For each percent that the magnitude of $q_t - q_b$ exceeds – 50%, the ΔT Trip Setpoint shall be automatically reduced by 0.0% of its value at RATED THERMAL POWER; and

(3) For each percent that the magnitude of $q_t - q_b$ exceeds + 2%, that ΔT Trip Setpoint shall be automatically reduced by 2.19% of its value at RATED THERMAL POWER.

NOTE 2: The channels maximum trip setpoint shall not exceed its computed setpoint by more than 0.84% of instrument span.

Proposed TS

NOTE 1 OVERTEMPERATURE ΔT
Equation variables are defined as follows:

- $K_1 =$ **1.31**
- $K_2 =$ **0.023/** $^{\circ}F$
- $K_3 =$ **0.00116/psi**
- $T' \leq$ **583°F (Indicated Loop** T_{avg} at RATED THERMAL POWER)
- $\tau_3 =$ **2s**
- $\tau_6 =$ **2s**

And $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power range neutron ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(1) For $q_t - q_b$ between – **18%** and **+ 7%**, $f_1(\Delta I) = 0$, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER;

(2) For each percent that the magnitude of $q_t - q_b$ exceeds – **18%**, the ΔT Trip Setpoint shall be automatically reduced by **3.51%** of its value at RATED THERMAL POWER; and

(3) For each percent that the magnitude of $q_t - q_b$ exceeds + **7%**, the ΔT Trip Setpoint shall be automatically reduced by **2.37%** of its value at RATED THERMAL POWER.

NOTE 2: **The Overtemperature ΔT function Allowable Value shall not exceed the nominal trip setpoint by more than 0.5% ΔT span for the ΔT channel, 0.2% ΔT span for the Pressurizer Pressure channel, and 0.4% ΔT span for the f(ΔI) channel. No separate Allowable Value is provided for T_{avg} because this function is part of the ΔT value.**

Basis for the Change: The accident and transient analyses have determined that the analytical limits utilized for Overtemperature ΔT reactor trip function will change for the EPU program. This function provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature and axial power distribution for various transient analyses.

Licensing Report Sections: LR Section 2.4.1, Reactor Protection, Safety Features Actuation and Control Systems, and LR Section 2.8.5.0, Non-LOCA Analyses Introduction.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 6, Overpower ΔT, Notes 3 and 4

Current TS

NOTE 3: OVERPOWER ΔT

Equation variables are defined as follows:

- $K_4 \leq 1.10$
- $K_5 \geq 0.02/°F$ for increasing average temperature and 0 for decreasing average temperature
- $T'' \leq 577.2°F$ (Nominal T_{avg} at RATED THERMAL POWER)
- $\tau_7 \geq 10$ sec

NOTE 4: The channel's maximum trip setpoint shall not exceed its computed trip setpoint by more than 0.96% of instrument span.

Proposed TS

NOTE 3: OVERPOWER ΔT

Equation variables are defined as follows:

- $K_4 = 1.10$
- $K_5 \geq$ **0.0/°F** for increasing average temperature and 0/**°F** for decreasing average temperature
- $T'' \leq$ **583°F (Indicated Loop** T_{avg} at RATED THERMAL POWER)
- $\tau_7 \geq$ **0** sec

NOTE 4: **The Overpower ΔT function Allowable Value shall not exceed the nominal trip setpoint by more than 0.5% ΔT span for the ΔT channel. No separate Allowable Value is provided for T_{avg} because this function is part of the ΔT value.**

Basis for the Change: The accident and transient analyses have determined that the constant (K_5) utilized for the Overpower ΔT reactor trip function will change for the EPU program. This function prevents power density anywhere in the core from exceeding the design power density. This provides assurance of fuel integrity under all possible overpower conditions.

Licensing Report Sections: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems, and LR Section 2.8.5.0, Non-LOCA Analyses Introduction.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 10, Reactor Coolant Flow - Low

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
10. Reactor Coolant Flow-Low	≥ 88.8% of loop design flow*	≥ 90% of loop design flow*
* Loop design flow = 85,000 gpm		

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
10. Reactor Coolant Flow-Low	≥ **89.6%** of loop design flow*	**90%** of loop design flow*
* Loop design flow = **86,900** gpm		

Basis for the Change: The EPU accident and transient analyses determined that the existing analytical limit (% flow) for the Reactor Coolant Flow – Low reactor trip does not change and the current nominal trip setpoint of 90% of loop design flow will not change. However, the value of loop design flow has changed for EPU. The Allowable Value is changing to comply with the methodology described in WCAP-17070-P. The trip setpoint is considered a nominal value (i.e., expressed as a value without inequalities) for purposes of COT and Channel Calibration. It is intended that the NTS be set at the setpoint in Table 2.2-1 within the as-left tolerance required by Note (b) in Table 4.3-1.

Licensing Report Sections: Section 2.4.1.2.3.2.3, Reactor Protection, Safety Features Actuation, and Control Systems and LR Section 2.8.5.0, Non-LOCA Analyses Introduction.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 11, Steam Generator (SG) Water Level Low-Low

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
11. SG Water Level Low-Low	≥ 8.15% of narrow range instrument span	≥ 10% of narrow range instrument span

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
11. SG Water Level Low-Low	≥ **15.5%** of narrow range instrument span	**16%** of narrow range instrument span

Basis for the Change: The accident and transient analyses have determined that the analytical limit utilized in the Loss of Normal Feedwater/Loss of AC Power events will remain unchanged for the EPU. The steam generator water level low-low reactor trip (and ESFAS initiation) safety analysis limit for a Loss of Normal Feedwater/Loss of AC Power event is 4.0% Narrow Range Span (NRS). To account for instrument channel uncertainties for EPU conditions and to provide additional margin for operator response time, the Technical Specification low-low SG water level setpoint will change from 10% to 16% NRS. The Allowable Value is changing to comply with the methodology described in WCAP-17070-P. The trip setpoint is considered a nominal value (i.e., expressed as a value without inequalities) for purposes of COT and Channel Calibration. It is intended that the NTS be set at the setpoint in Table 2.2-1 within the as-left tolerance required by Note (b) in Table 4.3-1.

Licensing Report Sections: LR Section 2.4.1.2.3.2.3, Reactor Protection, Safety Features Actuation, and Control Systems and LR Section 2.13.1, Risk Evaluation for EPU.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 12, Steam/Feedwater Flow Mismatch Coincident with Steam Generator Water Level – Low

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
12. Steam/Feedwater Flow Mismatch Coincident with	Feed Flow ≤ 23.9% below rated steam flow	Feed Flow ≤ 20% below rated steam flow
Steam Generator Water Level-Low	≥ 8.15% of narrow range instrument span	≥ 10% of narrow range instrument span

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
12. Steam/Feedwater Flow Mismatch Coincident with	Feed Flow $\leq$ **20.7%** below rated steam flow	Feed Flow **20%** below rated steam flow
Steam Generator Water Level-Low	$\geq$ **15.5%** of narrow range instrument span	**16%** of narrow range instrument span

Basis for the Change: The current main steam line flow and main feedwater flow transmitters require changes to support EPU. The transmitters are currently calibrated for a range of 0 - 4.0×10^6 lbm/hr. The main steam and main feedwater flow transmitters will be recalibrated for a range of 0 - 5.0×10^6 lbm/hr (0% flow to 129% flow). The expanded range meets or exceeds the current range. The NTS does not require a change for EPU. However, the Allowable Value changes from 23.9% to 20.7% below rated steam flow to comply with the methodology described in WCAP-17070-P, Rev. 1 [Reference 4].

The steam generator water level low signal, coincident with steam flow/feedwater flow mismatch, provides a backup reactor trip that is not specifically credited in the safety analyses. The proposed trip setpoint and Allowable Value are established by calculation. To account for instrument channel uncertainties for EPU conditions, the Technical Specification SG water level low trip setpoint will change from 10% NRS to 16% NRS and the Allowable Value will change from 8.15% to 15.5% to comply with the methodology as described in WCAP-17070-P. The trip setpoint is considered a nominal value (i.e., expressed as a value without inequalities) for purposes of COT and Channel Calibration. It is intended that the NTS be set at the setpoint in Table 2.2-1 within the as-left tolerance required by Note (b) in Table 4.3-1.

Licensing Report Section: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems.

Technical Specification Table 2.2-1 RTS Instrumentation Trip Setpoints Function 15.a, Turbine Trip – Auto Stop Oil Pressure, and 17.b.2) Turbine Trip

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
15. Turbine Trip a. Auto Stop Oil Pressure	$\geq$ 42 psig	$\geq$ 45 psig

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
15. Turbine Trip a. **Emergency Trip Header** Pressure	≥ **901** psig	**1000** psig

Basis for the Change: The 300 psi mechanical hydraulic system which controls the turbine will be replaced with an 1800 psi electrical hydraulic control system as part of EPU. The change to the Emergency Trip Header Pressure Allowable Value is required to be consistent with Westinghouse Setpoint Methodology in WCAP-17070-P, Rev. 1 [Revision 4]. As per the current licensing basis, the Turbine Trip is not credited in the safety analyses.

Proposed TS

Also revise functional unit 17.b.2), Reactor Trip System Interlocks on Low Power Reactor Trips Block, P-7 from "2) Turbine First Stage Pressure" to "2) Turbine **Inlet** Pressure."

Basis for the Change: The change in the RTS interlock wording clarifies the turbine pressure measurement location based on installation of the new Electro-Hydraulic Control (EHC) system.

Licensing Report Section: LR Section 2.5.1.2.2, Turbine Generator and LR Section 2.4.1, Reactor Protection, Engineered Safety Features and Control Systems.

Technical Specification Table 3.3-1, Reactor Trip System Instrumentation

Current TS

15. Turbine Trip
    a. Autostop Oil pressure

Proposed TS

15. Turbine Trip
    a. **Emergency Trip Header** Pressure

Basis for Change: The 300 psi mechanical hydraulic system which controls the turbine will be replaced with an 1800 psi electrical hydraulic control (EHC) system as part of EPU. The Emergency Trip Header Pressure associated with the new EHC system will serve the same function as an anticipatory trip that is not credited in the safety analyses.

Proposed TS

Also, revise functional unit 17b on Low Power Reactor Trips Block, P-7 on Turbine First Stage Pressure to ...on Turbine **Inlet** Pressure.

Basis for Change: The change in the RTS interlock wording clarifies the turbine pressure measurement location based on installation of the new Electro-Hydraulic Control (EHC) system.

Licensing Report Section: LR Section 2.5.1.2.2, Turbine Generator.

Technical Specification Table 4.3-1, RTS Instrumentation Surveillance Requirements, Notes

Current TS (Table Notes)

None.

Proposed TS (Table Notes)

Add Notes (a) and (b) in Table 4.3-1 to the applicable Channel Calibration and Analog Channel Operational Test surveillance requirements of the RTS functions that are proposed to be changed in attached table to specify as-found and as-left criteria in accordance with TSTF-493, Rev 4. The Table 4.3-1 functions to which these notes are applied are:

2.a Power Range, Neutron Flux – High Setpoint

5. Overtemperature ΔT Note 1 (K_1)

6. Overpower ΔT Note 3 (K_4)

10. Reactor Coolant Flow-Low

11. Steam Generator Water Level-Low-Low

12. Steam Generator Water Level-Low Coincident with Steam/Feedwater Flow Mismatch

15.a Turbine Trip – **Emergency Trip Header Pressure**

Note (a) states:

"If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service."

Note (b) states:

"The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTS) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTS are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (field settings) to confirm channel performance. The NTS and methodologies used to determine the as-found and the as-left tolerances are specified in UFSAR Section 7.2."

Basis for the Change: As defined in 10 CFR 50.36, LSSS are settings for automatic protective devices related to those variables having significant safety functions. 10 CFR 50.36 requires that these limiting settings be included in the Technical Specifications and have appropriate surveillance tests performed. Surveillance requirements are established to verify that reactor trip system instrumentation with an NTS in TS Table 2.2-1 operates within the boundaries of applicable instrument uncertainty calculations. These instrument tolerances are implemented in plant procedures in accordance with Notes (a) and (b) above which are consistent with the wording in TSTF 493 Rev.4. The methods used to determine NTS values and summaries of calculations are described in WCAP-17070-P, Rev. 1 [Reference 4] and will be incorporated into UFSAR Section 7.2. The implementation of as-left and as-found tolerances verifies that the instrument loops are performing in accordance with uncertainty calculation assumptions and that

out-of tolerance conditions are evaluated. If a channel cannot be set within the as-left tolerance band, the channel is declared inoperable and Note (b) applies.

Proposed TS

Also, revise functional unit 17b on Low Power Reactor Trips Block, P-7 on Turbine First Stage Pressure to ...on Turbine **Inlet** Pressure.

Basis for Change: The change in the RTS interlock wording clarifies the turbine pressure measurement location and is based on the installation of the new Electro-Hydraulic Control (EHC) system. As per the current licensing basis, the Turbine Trip is not credited in the safety analyses.

Licensing Report Section: LR Section 2.4.1, Reactor Protection, Engineered Safety Features and Control Systems and LR Section 2.5.1.2.2, Turbine Generator.

Technical Specification Table 3.3-2 ESFAS Instrumentation Function 1, Safety Injection

Current TS

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Safety Injection (Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except Manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)					

Proposed TS

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. **Safety Injection**					

Basis for the Change: The list of SI actuated equipment/systems is being removed since they are already identified in the Technical Specification basis and each are controlled under separate specifications. This is also consistent with Standard Technical Specifications (NUREG 1431 Rev. 3).

Licensing Report Section: None

Technical Specification Table 3.3-2 ESFAS Instrumentation Function 5, Feedwater Isolation

Current TS

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2	22
b. Safety-Injection	See Item 1. above for all Safety Injection initiating functions and requirements				
c. Steam Generator Water Level – High-High####	3/steam generator	2/steam generator in any operating steam generator	2/steam generator in any operating steam generator	1, 2	15

Proposed TS

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, **3**	22
b. Safety-Injection	See Item 1. above for all Safety Injection initiating functions and requirements				
c. Steam Generator Water Level – High-High####	3/steam generator	2/steam generator in any operating steam generator	2/steam generator in any operating steam generator	1, 2, **3**	15

Basis for the Change: Proposed Technical Specification 3/4.7.1.7 adds LCO requirements for the new Feedwater Isolation Valves (FIVs) consistent with NUREG-1431, Standard Technical Specifications Westinghouse Plants with applicability to Modes 1, 2 and 3. The current LCO for the ESFAS Feedwater isolation function applies to modes 1 and 2 only. In order to be consistent with new LCO 3/4.7.1.7, the ESFAS modes of applicability are being changed in this table.

Licensing Report Sections: LR Section 2.5.5.4, Condensate and Feedwater and LR Section 2.6.3.2, Mass and Energy Release Analysis for Secondary System Pipe Ruptures.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints

Current TS (General)

This Technical Specification table contains changes to NTS and Allowable Values for ESFAS setpoints. The NTS values are the LSSS values that are derived from the analytical values and adjusted to account for the specific instrument uncertainties. The Allowable Values and NTS for selected functions in Technical Specification Table 3.3-3 (ESFAS Instrumentation Trip Setpoints) are being revised to reflect changes resulting from EPU and implementation of the methodology of WCAP-17070-P, Rev. 1 [Reference 4].

Proposed TS (General)

The NTS values for ESFAS Trip Setpoints and Allowable Values are proposed to be changed, as described below, for the following functions:

1.f Safety Injection (SI)-Steam Line Flow-High Coincident with Steam Generator Pressure-Low

4.d Steam Line Isolation-Steam Line Flow-High Coincident with Steam Line Pressure –Low or T_{avg}-Low

5.c Feedwater Isolation-Steam Generator Water level High-High

6.b Auxiliary Feedwater(3)-Steam Generator Water Level-Low-Low

7.b Loss of Power-480V Load Centers Undervoltage

7.c Loss of Power-480V Load Centers Degraded Voltage

Basis for the Change: As defined in 10 CFR 50.36, LSSS are settings for automatic protective devices related to those variables having significant safety functions. 10 CFR 50.36 requires that these limiting settings be included in the Technical Specifications.

The NTS values proposed for TS Table 3.3-3 are values for the nominal trip setpoint and are calculated such that there is 95% probability and 95% confidence that the interlock, permissive or block function will occur prior to the process variable exceeding the established limit and ensures the interlock, permissive or block function will occur in accordance with the assumptions of the analyses. Therefore, the assumptions of the safety analyses and results are protected by proposed LSSS values. The methods used to determine NTS values and summaries of calculations are provided in LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems, and WCAP-17070-P, Rev. 1 [Reference 4]. These NTS values have been evaluated under EPU conditions using methods described in LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems, and WCAP-17070-P, Rev. 1 [Reference 4].

Licensing Report Section: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 1. Safety Injection

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
1. Safety Injection (Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except Manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)		

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
1. **Safety Injection**		

Basis for the Change: The list of SI actuated equipment/systems is being removed since they are already identified in the Technical Specification basis and each are controlled under separate specifications. Removal of these items is also consistent with Standard Technical Specifications (NUREG 1431 Rev 3).

Licensing Report Section: None.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 1.f, Safety Injection on Steam Line Flow – High Coincident with SG Pressure – Low or T_{avg} - Low

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
1. Safety Injection f. Steam Line Flow -- High	≤A function defined as follows: A ΔP corresponding to 44% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 116.5% steam flow at full load	≤A function defined as follows: A ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load
Coincident with: Steam Generator Pressure - Low	≥ 588 psig	≥ 614 psig

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
1. Safety Injection f. Steam Line Flow -- High	≤A function defined as follows: A ΔP corresponding to **41.2%** steam flow at 0% load increasing linearly from 20% load to a value corresponding to **114.4%** steam flow at full load	A function defined as follows: A ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load
Coincident with: Steam Generator Pressure – Low **(4)**	≥ **607** psig	**614** psig
(4) Time constants utilized in the lead-lag controller for Steam Generator Pressure–Low and Steam Line Pressure-Low are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds. CHANNEL CALIBRATION shall ensure that these time constants are adjusted to these values.		

Basis for the Change: The existing NTS of less than or equal to a ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load is acceptable for the EPU and is not changing. However, the Allowable Value must be changed to a ΔP corresponding to 41.2% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114.4% steam flow at full load to comply with the methodology of WCAP-17070-P, Rev. 1 [Reference 4].

The accident analyses determined that the analytical limit for the steam line pressure low SI inside containment steamline break will need to be revised from the existing value of 432.3 psig to 566.3 psig for the EPU. The current Safety Analysis Limit (SAL) of 432.3 psig remains applicable for the outside containment steamline break analysis. Although the SAL is increasing to 566.3 psig, the current NTS of 614 psig has adequate margin to accommodate the new SAL limit and will not change. There is however, a change required to the Allowable Value to comply with the methodology in WCAP-17070-P, Rev. 1 [Reference 4]. The trip setpoint is considered a nominal value (i.e., expressed as a value without inequalities) for purposes of COT and Channel Calibration.

The addition of the lead/lag addressed in the new Note (4) on the steamline pressure input causes the safety injection signal to occur significantly faster, reducing the total mass that enters containment.

Licensing Report Sections: LR Section 2.4.1.2.3.2.4, Reactor Protection, Safety Features Actuation, and Control Systems; and LR Section 2.6.3.2, Mass and Energy Release Analysis for Secondary System Pipe Ruptures.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 4.d., Steam Line Isolation on Steam Line Flow – High Coincident with Steam Line Pressure – Low or T_{avg} - Low

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
4. Steam Line Isolation d. Steam Line Flow -- High	≤A function defined as follows: A ΔP corresponding to 44% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 116.5% steam flow at full load	≤A function defined as follows: A ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load
Coincident with: Steam Line Pressure - Low	≥ 588 psig	≥ 614 psig

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
4. Steam Line Isolation d. Steam Line Flow -- High	≤A function defined as follows: A ΔP corresponding to **41.2**% steam flow at 0% load increasing linearly from 20% load to a value corresponding to **114.4**% steam flow at full load	A function defined as follows: A ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load
Coincident with: Steam Line Pressure – Low **(4)**	≥ **607** psig	**614** psig
(4) Time constants utilized in the lead-lag controller for Steam Generator Pressure–Low and Steam Line Pressure-Low are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds. CHANNEL CALIBRATION shall ensure that these time constants are adjusted to these values.		

Basis for the Change: The accident analyses determined that the analytical limit for the EPU for the high steam flow function is 60% steam flow at 0% load increasing linearly from 20% load to a value of 129% steam flow at full load. The full load value is an increase from the existing value of 120% steam flow. The existing NTS ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load is acceptable for the EPU. However, the Allowable Value must be changed to comply with the methodology of WCAP-17070-P, Rev. 1 [Reference 4].

The accident analyses determined that the analytical limit for the steam line pressure low SI inside containment steam break will need to be revised from the existing value of 432.3 psig to 566.3 psig for the EPU. The current SAL of 432.3 psig remains applicable for the outside containment steam break analysis. Although the SAL is increasing to 566.3 psig, the current nominal trip setpoint of 614 psig has adequate margin to accommodate the new SAL limit and will not change. There is however, a change required to the Allowable Value as shown above to comply with the methodology described in WCAP-17070-P, Rev. 1 [Reference 4]. The trip setpoint is considered a nominal value (i.e., expressed as a value without inequalities) for purposes of COT and Channel Calibration.

The addition of the lead/lag addressed in the new Note (4) on the steamline pressure input causes the safety injection signal to occur significantly faster, reducing the total mass that enters containment.

Licensing Report Sections: LR Section 2.4.1.2.3.2.4, Reactor Protection, Safety Features Actuation, and Control System and LR Section 2.6.3.2, Mass and Energy Release Analysis for Secondary System Pipe Ruptures.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 5.c, Feedwater Isolation - SG Water Level – High-High

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
5. Fedwater Isolation c. Steam Generator Water Level High-High	≤81.9% of narrow range instrument span	≤80% of narrow range instrument span

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
5. **Feedwater** Isolation c. Steam Generator Water Level High-High	≤**80.5%** of narrow range instrument span	**80%** of narrow range instrument span

Basis for the Change: For operational considerations, the top of the instrument span is assumed with allowances for void fraction (maximum reliable indicated level (MRIL)). The uncertainty analysis is based on maintaining the operating limit below the MRIL of 96.8% narrow range span (NRS). The current trip setpoint of 80% NRS has adequate margin to accommodate the MRIL and will not change. There is however, a change required to the Allowable Value shown above to comply with the methodology described in WCAP-17070-P, Rev. 1 [Reference 4]. The trip setpoint is considered a nominal value (i.e., expressed without inequalities) for purposes of COT and Channel Calibration.

Licensing Report Section: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control System.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 6.b, Auxiliary Feedwater – Steam Generator Water Level – Low-Low

Current TS

	ALLOWABLE VALUE	TRIP SETPOINT
6. Auxiliary Feedwater b. Steam Generator Water Level Low-Low	≥8.15% of narrow range instrument span	≥10% of narrow range instrument span

Proposed TS

	ALLOWABLE VALUE	TRIP SETPOINT
6. Auxiliary Feedwater b. Steam Generator Water Level Low-Low	**≥15.5%** of narrow range instrument span	**16%** of narrow range instrument span

Basis for the Change: The accident and transient analyses have determined that the analytical limit utilized in the Loss of Normal Feedwater/Loss of AC Power events will not change for the EPU. The steam generator water level low-low reactor trip (and ESFAS initiation) SAL for a Loss of Normal Feedwater/Loss of AC Power event is 4.0% NRS. To account for instrument channel uncertainties for EPU conditions and to provide additional margin for operator action, the low-low setpoint will change from 10% NRS to 16% NRS and the Allowable Value will change from 8.15% to 15.5% to comply with the methodology described in WCAP-17070-P, Rev. 1 [Reference 4]. The trip setpoint is considered a nominal value (i.e., expressed as a value without inequalities) for purposes of COT and Channel Calibration.

Licensing Report Sections: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control System, LR Section 2.8.5.2.2, Loss of Non-Emergency AC Power to Station Auxiliaries, and LR Section 2.8.5.2.3, Loss of Normal Feedwater Flow.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 7.b 480v Load Centers Undervoltage

Current TS

Load Center	Allowable Value	Trip Setpoint
3A	[ ]	430V±5V (10 Sec ±1sec delay)
3B	[ ]	438V±5V (10 Sec ±1sec delay)
3C	[ ]	434V±5V (10 Sec ±1sec delay)
3D	[ ]	434V±5V (10 Sec ±1sec delay)
4A	[ ]	435V±5V (10 Sec ±1sec delay)
4B	[ ]	434V±5V (10 Sec ±1sec delay)
4C	[ ]	434V±5V (10 Sec ±1sec delay)
4D	[ ]	430V±5V (10 Sec ±1sec delay)

Proposed TS

Load Center	Allowable Value	Trip Setpoint
3A	[ ]	430V±**3**V (10 Sec ±1sec delay)
3B	[ ]	438V±**3**V (10 Sec ±1sec delay)
3C	[ ]	434V±**3**V (10 Sec ±1sec delay)
3D	[ ]	434V±**3**V (10 Sec ±1sec delay)
4A	[ ]	435V±**3**V (10 Sec ±1sec delay)
4B	[ ]	434V±**3**V (10 Sec ±1sec delay)
4C	[ ]	434V±**3**V (10 Sec ±1sec delay)
4D	[ ]	430V±**3**V (10 Sec ±1sec delay)

Basis for the Change: The evaluations demonstrate that there are no adverse voltage effects on the safety-related 480 V load center buses protected by degraded voltage relays (327I) and under voltage relays (327H). The bounding steady-state and transient-state voltages remain within acceptable limits. Therefore, the degraded voltage relay and under voltage relay settings are not affected by operation at EPU conditions.

The 480 V system evaluations indicate that the degraded voltage relays (327I), under voltage relays (327H) and the inverse-time degraded voltage relays (327T) have sufficient voltage to pickup within the required time frame following a dropout under transient-state conditions.

The design basis for the undervoltage and degraded voltage relay settings are not affected by operation at EPU conditions. The reduced tolerances for the under voltage and degraded voltage trip setpoints result in increased operating voltage margin at the 480V load centers. The existing ± 5V tolerance on the under voltage and degraded voltage relay setpoints results in a setpoint span of 10V on the operating voltage range of the 480V load centers which produces a tight operating voltage margin. Reducing the setpoint tolerance to ±3V will result in a setpoint span of 6V on the operating voltage range thus increasing the operating voltage margin. This tightened tolerance band is within the capability of the relays.

Licensing Report Section: LR Section 2.3.3, AC Onsite Power System.

Technical Specification Table 3.3-3 ESFAS Instrumentation Trip Setpoints Function 7.c 480v Load Centers Degraded Voltage

Current TS

Load Center	Allowable Value	Trip Setpoint
3A	[ ]	424V±5V (60 Sec ±30 sec delay)
3B	[ ]	427V±5V (60 Sec ±30 sec delay)
3C	[ ]	437V±5V (60 Sec ±30 sec delay)
3D	[ ]	435V±5V (60 Sec ±30 sec delay)
4A	[ ]	430V±5V (60 Sec ±30 sec delay)
4B	[ ]	436V±5V (60 Sec ±30 sec delay)
4C	[ ]	434V±5V (60 Sec ±30 sec delay)
4D	[ ]	434V±5V (60 Sec ±30 sec delay)

Proposed TS

Load Center	Allowable Value	Trip Setpoint
3A	[ ]	424V±**3**V (60 Sec ±30 sec delay)
3B	[ ]	427V±**3**V (60 Sec ±30 sec delay)
3C	[ ]	437V±**3**V (60 Sec ±30 sec delay)
3D	[ ]	435V±**3**V (60 Sec ±30 sec delay)
4A	[ ]	430V±**3**V (60 Sec ±30 sec delay)
4B	[ ]	436V±**3**V (60 Sec ±30 sec delay)
4C	[ ]	434V±**3**V (60Sec ±30 sec delay)
4D	[ ]	434V±**3**V (60 Sec ±30 sec delay)

Basis for the Change: The EPU evaluations demonstrate that there are no adverse voltage effects on the safety-related 480 V load center buses protected by degraded voltage relays (327I) and under voltage relays (327H). The bounding steady-state and transient-state voltages remain within acceptable limits. Therefore, the degraded voltage relay and under voltage relay settings are not affected by operation at EPU conditions.

The 480 V system evaluations indicate that the degraded voltage relays (327I), under voltage relays (327H) and the inverse-time degraded voltage relays (327T) have sufficient voltage to pickup within the required time frame following a dropout under transient-state conditions.

The design basis for the undervoltage and degraded voltage relay settings are not affected by operation at EPU conditions. The design basis for the undervoltage and degraded voltage relay settings are not affected by operation at EPU conditions. The reduced tolerances for the under voltage and degraded voltage trip setpoints result in increased operating voltage margin at the 480V load centers. The existing ± 5V tolerance on the under voltage and degraded voltage relay setpoints results in a setpoint span of 10V on the operating voltage range of the 480V load centers which produces a tight operating voltage margin. Reducing the setpoint tolerance to ±3V

will result in a setpoint span of 6V on the operating voltage range thus increasing the operating voltage margin. This tightened tolerance band is within the capability of the relays.

Licensing Report Section: LR Section 2.3.3, AC Onsite Power System.

Technical Specification Table 4.3-2 ESFAS Instrumentation Surveillance Requirements, Notes

Current TS (Table Notes)

None.

Proposed TS (Table Notes)

Add Notes (a) & (b) in Table 4.3-2 to the applicable Channel Calibration and analog channel operational test surveillance requirements for ESFAS Functions listed below to specify as-found and as-left criteria in accordance with TSTF-493, Rev. 4:

1.f Safety Injection (SI)-Steam Line Flow-High Coincident with Steam Generator Pressure-Low

4.d Steam Line Isolation-Steam Line Flow-High Coincident with Steam Line Pressure –Low or T_{avg}-Low

5.c Feedwater Isolation-Steam Generator Water level High-High

6.b Auxiliary Feedwater(2)-Steam Generator Water Level-Low-Low

Note (a) states:

"If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service."

Note (b) states:

"The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTS) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTS are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (field settings) to confirm channel performance. The NTS and methodologies used to determine the as-found and the as-left tolerances are specified in UFSAR Section 7.2."

Basis for the Change: As defined in 10 CFR 50.36, LSSS are settings for automatic protective devices related to those variables having significant safety functions. 10 CFR 50.36 requires that these limiting settings be included in the Technical Specifications and have appropriate surveillance test performed. Surveillance requirements are established to verify that engineered safety features actuation system instrumentation with an NTS in TS Table 3.3-3 operates within the boundaries of applicable instrument uncertainty calculations. These instrument tolerances are implemented in plant procedures in accordance with Notes (a) and (b) above which are consistent with the wording in TSTF 493 Rev.4. The methods used to determine NTS values and summaries of calculations are described in WCAP-17070-P, Rev. 1 [Reference 4] and will be

incorporated into UFSAR Section 7.2. The implementation of as-left and as-found tolerances verifies that the instrument loops are performing in accordance with uncertainty calculation assumptions and that out-of tolerance conditions are evaluated. If a channel cannot be set within the as-left tolerance band, the channel is declared inoperable and Note (b) applies.

Licensing Report Section: LR Section 2.4.1, Reactor Protection, Safety Features Actuation, and Control Systems.

Technical Specification Table 4.3-2 ESFAS Instrumentation Surveillance Requirements Function 1. Safety Injection and Function 5.a/5.c Steam Generator Water Level--High-High

Current TS

FUNCTIONAL UNIT	CHANNEL Check	CHANNEL Calibration	Analog Channel Operational Test	Trip Actuating Device Operational test	Actuation Logic test	Modes For Which Surveillance Is Required
1. Safety Injection (Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except Manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)						
5Feedwater Isolation .a. Automatic Actuation Logic and Actuation Relays						1,2
.c. Steam Generator Water Level—High-High						1,2

Proposed TS

FUNCTIONAL UNIT	CHANNEL Check	CHANNEL Calibration	Analog Channel Operational Test	Trip Actuating Device Operational test	Actuation Logic test	Modes For Which Surveillance Is Required
1. **Safety Injection**						
5. Feedwater Isolation						
.a. Automatic Actuation Logic and Actuation Relays						1,2,**3**
.c. Steam Generator Water Level—High-High						1,2,**3**

Basis for the Change: The list of SI actuated equipment/systems is being removed since they are already identified in the Technical Specification basis and each are controlled under separate specifications. Removal of these items from the technical specifications is consistent with Standard Technical Specifications (NUREG 1431 Rev 3). Mode 3 is added to the column "Modes for Which Surveillance is Required" to be consistent with new Technical Specification 3.7.1.7, Feedwater Isolation.

Licensing Report Section: None.

References

1. M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request for Extended Power Uprate (LAR 205)," Accession No. ML103560169, October 21, 2010.
2. NRC ITSB Telephone Conference Call, July 20, 2011.
3. Technical Specification Task Force (TSTF) Change Traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS Functions," July 31, 2009.
4. M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2011-190), "Response to U.S. Nuclear Regulatory Commission Request for Additional Information Regarding Extended Power Uprate License Amendment Request No. 205 and Instrumentation and Controls Issues," (TAC Nos. ME4907 and ME4908), Accession No. ML11174A165, June 21, 2011.

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
1. Manual Reactor Trip	N.A.	N.A.
2. Power Range, Neutron Flux	109.6	
a. High Setpoint	≤ ~~112.0~~% of RTP**	≤ 109.0% of RTP**
b. Low Setpoint	≤ 28.0% of RTP**	≤ 25% of RTP**
3. Intermediate Range, Neutron Flux	≤ 31.0% of RTP**	≤ 25% of RTP**
4. Source Range, Neutron Flux	≤ 1.4 X 10^5 cps	≤ 10^5 cps
5. Overtemperature ΔT	See Note 2	See Note 1
6. Overpower ΔT	See Note 4	See Note 3
7. Pressurizer Pressure-Low	≥ 1817 psig	≥ 1835 psig
8. Pressurizer Pressure-High	≤ 2403 psig	≤ 2385 psig
9. Pressurizer Water Level-High	≤ 92.2% of instrument span	≤ 92% of instrument span
10. Reactor Coolant Flow-Low	89.6 ≥ ~~88.8~~% of loop design flow*	≥ 90% of loop design flow*
11. Steam Generator Water Level Low-Low	15.5 ≥ ~~8.15~~% of narrow range instrument span	16 ≥ ~~10~~% of narrow range instrument span

86,900

* Loop design flow = ~~85,000~~ gpm
** RTP = Rated Thermal Power

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
12. Steam/Feedwater Flow Mismatch Coincident with	20.7 Feed Flow ≤ ~~23.9~~% below rated Steam Flow	Feed Flow ≤ 20% below rated Steam Flow
Steam Generator Water Level-Low	15.5 ≥ ~~8.15~~% of narrow range instrument span	16 ≥ ~~10~~% of narrow range instrument span
13. Undervoltage – 4.16 kV Busses A and B	≥ 69% bus voltage	≥ 70% bus voltage
14. Underfrequency – Trip of Reactor Coolant Pump Breaker(s) Open	≥ 55.9 Hz	≥ 56.1 Hz
15. Turbine Trip		
a. ~~Auto Stop Oil~~ Pressure	≥ ~~424~~ psig	~~≥ 45~~ psig
b. Turbine Stop Valve Closure	Fully Closed***	Fully Closed***
16. Safety Injection Input from ESF	N.A.	N.A.
17. Reactor Trip System Interlocks		
a. Intermediate Range Neutron Flux, P-6	≥ 6.0×10^{-11} amps	Nominal 1×10^{-13} amps

Emergency Trip Header
901
1000

*** Limit switch is set when Turbine Stop Valves are fully closed.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
b. Low Power Reactor Trips Block, P-7		
1) P-10 input (Inlet)	≤ 13.0% RTP**	Nominal 10% of RTP**
2) Turbine ~~First Stage~~ Pressure	≤ 13.0% Turbine Power	Nominal 10% Turbine Power
c. Power Range Neutron Flux, P-8	≤ 48.0% RTP**	Nominal 45% of RTP**
d. Power Range Neutron Flux, P-10	≥ 7.0% RTP**	Nominal 10% of RTP**
18. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.
19. Reactor Trip Breakers	N.A.	N.A.
20. Automatic Trip and Interlock Logic	N.A.	N.A.

** RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)
TABLE NOTATIONS

NOTE 1: OVERTEMPERATURE ΔT

$$\Delta T \left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)\left(\frac{1}{1+\tau_3 S}\right) \le \Delta T_0 \left\{K_1 - K_2 \frac{(1+\tau_4 S)}{(1+\tau_5 S)}\left[T \frac{1}{(1+\tau_6 S)} - T'\right] + K_3(P - P') - f_1(\Delta I)\right\}$$

Where: ΔT = Measured ΔT by RTD Instrumentation

$\frac{1+\tau_1 S}{1+\tau_2 S}$ = Lead/Lag compensator on measured ΔT; τ_1 = 0s, τ_2 = 0s

$\frac{1}{1+\tau_3 S}$ = Lag compensator on measured ΔT; τ_3 = ~~0s~~ 2s

ΔT_0 = Indicated ΔT at RATED THERMAL POWER

K_1 = ~~1.24;~~ 1.31

K_2 = ~~0.017/°F;~~ 0.023/°F

$\frac{1+\tau_4 S}{1+\tau_5 S}$ = The function generated by the lead-lag compensator for T_{avg} dynamic compensation;

τ_4, τ_5 = Time constants utilized in the lead-lag compensator for T_{avg}, τ_4 = 25s, τ_5 = 3s;

T = Average temperature, °F;

$\frac{1}{1+\tau_6 S}$ = Lag compensator on measured T_{avg}; τ_6 = ~~0~~s 2s

583 ≤ Indicated Loop

T′ = ~~577.2~~ °F (~~Nominal~~ T_{avg} at RATED THERMAL POWER);

K_3 = ~~0.001/psig;~~ 0.00116/ psi

P = Pressurizer pressure, psig;

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

P' ≥ 2235 psig (Nominal RCS operating pressure);

S = Laplace transform operator, s^{-1};

18%

And $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range neutron ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

7%

(1) For $q_t - q_b$ between – ~~50%~~ and + ~~2%~~, $f_1(\Delta I) = 0$, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER;

18%

3.51%

(2) For each percent that the magnitude of $q_t - q_b$ exceeds – ~~50%~~, the ΔT Trip Setpoint shall be automatically reduced by ~~0.0%~~ of its value at RATED THERMAL POWER; and

7%, the

2.37%

(3) For each percent that the magnitude of $q_t - q_b$ exceeds + ~~2%, that~~ ΔT Trip Setpoint shall be automatically reduced by ~~2.19%~~ of its value at RATED THERMAL POWER.

NOTE 2: ~~The channels maximum trip setpoint shall not exceed its computed setpoint by more than 0.84% of instrument span.~~

The Overtemperature ΔT function Allowable Value shall not exceed the nominal trip setpoint by more than 0.5% ΔT span for the ΔT channel, 0.2% ΔT span for the Pressurizer Pressure channel, and 0.4% ΔT span for the f(ΔI) channel. No separate Allowable Value is provided for Tavg because this function is part of the ΔT value.

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 3: OVERPOWER ΔT

$$\Delta T \frac{(1+\tau_1 S)}{(1+\tau_2 S)}\left(\frac{1}{1+\tau_3 S}\right) \leq \Delta T_0 \left\{K_4 - K_5 \frac{\tau_7 S}{1+\tau_7 S}\left(\frac{1}{1+\tau_6 S}\right) T - K_6 \left[T \frac{1}{1+\tau_6 S} - T''\right] - f_2(\Delta I)\right\}$$

Where: ΔT = As defined in Note 1,

$\frac{1+\tau_1 S}{1+\tau_2 S}$ = As defined in Note 1,

$\frac{1}{1+\tau_3 S}$ = As defined in Note 1,

ΔT_0 = As defined in Note 1,

K_4 ≤ 1.10,

K_5 ≥ ~~0.02~~/°F for increasing average temperature and ~~0~~ for decreasing average temperature,

$\frac{\tau_7 S}{1+\tau_7 S}$ = The function generated by the lead-lag compensator for T_{avg} dynamic compensation;

τ_7 = Time constants utilized in the lead-lag compensator for T_{avg}, $\tau_7 \geq$ ~~10 s,~~ 0 s,

$\frac{1}{1+\tau_6 S}$ = As defined in Note 1,

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 3: (Continued)

K_0 = 0.0016/°F for T > T"

= 0 for T ≤ T",

T = 583 As defined in Note 1. Indicated Loop

T" ≤ ~~577.2~~°F (~~Nominal~~ T_{avg} at RATED THERMAL POWER)

S = As defined in Note 1, and

$f_2(\Delta I)$ = 0 for all ΔI

NOTE 4: ~~The channel's maximum trip setpoint shall not exceed its computed trip setpoint by more than 0.96% of instrument span.~~

The Overpower ΔT function Allowable Value shall not exceed the nominal trip setpoint by more than 0.5% ΔT span for the ΔT channel. No separate Allowable Value is provided for Tavg because this function is part of the ΔT value.

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Steam Generator Water Level--Low-Low	3/stm. gen.	2/stm. gen.	2/stm. gen.	1, 2	6
12. Steam Generator Water Level--Low Coincident With Steam/ Feedwater Flow Mismatch	2 stm. gen. level and 2 stm./feed-water flow mismatch in each stm. gen.	1 stm. gen. level coin-cident with 1 stm./feed-water flow mismatch in same stm. gen.	1 stm. gen. level and 2 stm./feed-water flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.	1, 2	6
13. Undervoltage--4.16 KV Busses A and B (Above P-7)	2/bus	1/bus on both busses	2/bus	1	12
14. Underfrequency-Trip of Reactor Coolant Pump Breaker(s) Open (Above P-7)	2/bus	1 to trip RCPs***	2/bus	1	11
15. Turbine Trip (Above P-7)					
a. ~~Autostop Oil~~ Pressure	3	2	2	1	12
b. Turbine Stop Valve Closure	2	2	2	1	12

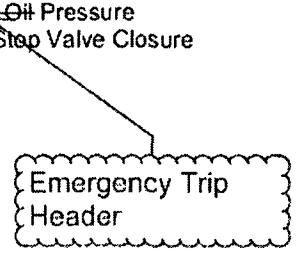

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
16. Safety Injection Input from ESF	2	1	2	1, 2	8
17. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2	1	2	2#	7
b. Low Power Reactor Trips Block, P-7					
P-10 Input	4	2	3	1	7
or					
Turbine ~~First~~ Inlet ~~Stage~~ Pressure	2	1	2	1	7
c. Power Range Neutron Flux, P-8	4	2	3	1	7
d. Power Range Neutron Flux, P-10	4	2	3	1, 2	7
18. Reactor Coolant Pump Breaker Position Trip					
a. Above P-8	1/breaker	1	1/breaker	1	11
b. Above P-7 and below P-8	1/breaker	2	1/breaker	1	11
19. Reactor Trip Breakers	2	1	2	1, 2	8, 10
	2	1	2	3*, 4*, 5*	9
20. Automatic Trip and Interlock logic	2	1	2	1, 2	8
	2	1	2	3*, 4*, 5*	9

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	N.A.	R(11)	N.A.	1, 2, 3*, 4*, 5*
2. Power Range, Neutron Flux a. High Setpoint	S	D(2, 4), M(3, 4), Q(4, 6), R(4)	Q (a), (b)	N.A.	N.A.	1, 2
b. Low Setpoint	S	R(4)	S/U(1)	N.A.	N.A.	1***, 2
3. Intermediate Range, Neutron Flux	S	R(4)	S/U(1)	N.A.	N.A.	1***, 2
4. Source Range, Neutron Flux	S	R(4) (a), (b)	S/U(1), Q(9)	N.A.	N.A.	2**, 3, 4, 5
5. Overtemperature ΔT	S	R (a), (b)	Q (a), (b)	N.A.	N.A.	1, 2
6. Overpower ΔT	S	R	Q (a), (b)	N.A.	N.A.	1, 2
7. Pressurizer Pressure--Low	S	R	Q	N.A.	N.A.	1
8. Pressurizer Pressure--High	S	R	Q	N.A.	N.A.	1, 2
9. Pressurizer Water Level--High	S	R (a),(b)	Q (a),(b)	N.A.	N.A.	1
10. Reactor Coolant Flow--Low	S	R	Q	N.A.	N.A.	1
11. Steam Generator Water Level--Low-Low	S	R	Q	N.A.	N.A.	1, 2

Emergency Trip Header

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
12. Steam Generator Water Level--Low Coincident with Steam/Feedwater Flow Mismatch	S	R [illegible]	Q [illegible]	N.A.	N.A.	1, 2
13. Undervoltage – 4.16 kV Busses A and B	N.A.	R	N.A.	N.A.	N.A.	1
14. Underfrequency – Trip of Reactor Coolant Pump Breakers(s) Open	N.A.	R (a), (b)	N.A.	N.A.	N.A.	1
15. Turbine Trip						
a. ~~Autostop Oil~~ Pressure	N.A.	R	N.A.	S/U(1, 10)	N.A.	1
b. Turbine Stop Valve Closure	N.A.	R	N.A.	S/U(1, 10)	N.A.	1
16. Safety Injection Input from ESF	N.A.	N.A.	N.A.	R	N.A.	1, 2
17. Reactor Trip System Interlocks						
a. Intermediate Range Neutron Flux, P-6	N.A.	R(4)	R	N.A.	N.A.	2**
b. Low Power Reactor Trips Block, P-7 (includes P-10 input and Turbine ~~First Stage~~ Pressure)	N.A.	R(4)	R	N.A.	N.A.	1
c. Power Range Neutron Flux, P-8	N.A.	R(4)	R	N.A.	N.A.	1

Inlet

(a) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

TABLE 4.3-1 (Continued)

TABLE NOTATIONS

* When the Reactor Trip System breakers are closed and the Control Rod Drive System is capable of rod withdrawal.

** Below P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.

*** Below P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

(1) If not performed in previous 31 days.

(2) Comparison of calorimetric to excore power level indication above 15% of RATED THERMAL POWER (RTP). Adjust excore channel gains consistent with calorimetric power level if the absolute difference is greater than 2%. Below 70% RTP, downward adjustments of NIS excore channel gains to match a lower calorimetric power level are not required. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.

(3) Single point comparison of incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference is greater than or equal to 3%. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.

(4) Neutron detectors may be excluded from CHANNEL CALIBRATION.

(5) This table Notation number is not used.

(6) Incore-Excore Calibration, above 75% of RATED THERMAL POWER (RTP). If the quarterly surveillance requirement coincides with sustained operation between 30% and 75% of RTP, calibration shall be performed at this lower power level. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.

(7) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(8) DELETED

(9) Quarterly surveillance in MODES 3*, 4*, and 5* shall also include verification that permissive P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window. Quarterly surveillance shall include verification of the High Flux at Shutdown Alarm Setpoint of 1/2 decade above the existing count rate.

(10) Setpoint verification is not applicable.

(11) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall include independent verification of the OPERABILITY of the undervoltage and shunt trip attachment of the Reactor Trip Breakers.

(b) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTS) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTS are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (field settings) to confirm channel performance. The NTS and methodologies used to determine the as-found and the as-left tolerances are specified in UFSAR Section 7.2.

TABLE 3.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Safety Injection ~~(Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except Manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water).~~					
a. Manual Initiation	2	1	2	1 2, 3, 4	17
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1 2, 3, 4	14
c. Containment Pressure - High	3	2	2	1 2, 3	15
d. Pressurizer Pressure - Low	3	2	2	1 2, 3[#]	15
e. High Differential Pressure Between the Steam Line Header and any Steam Line	3/steam line	2/steam line in any steam line	2/steam line	1 2, 3[#]	15

TABLE 3.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. Steam Line Isolation (Continued)					
d. Steam Line Flow--High Coincident with: Steam Generator Pressure--Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	15
	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3	15
or T_{avg}--Low	1/Loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3	25
5. Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2 [3]	22
b. Safety-Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
c. Steam Generator Water Level -- High-High# # # #	3/steam generator	2/steam generator in any operating steam generator	2/steam generator in any operating steam generator	1, 2	15
6. Auxiliary Feedwater# # #					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	20

TABLE 3.3-3
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
1. Safety Injection ~~(Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except Manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)~~		
a. Manual Initiation	N.A.	N.A.
b. Automatic Actuation Logic	N.A	N.A
c. Containment Pressure--High	≤4.5 psig	≤4.0 psig
d. Pressurizer Pressure--Low	≥1712 psig	≥1730 psig
e. High Differential Pressure Between the Steam Line Header and any Steam Line.	≤114 psig	≤100 psi
f. Steam Line Flow--High	≤A function defined as follows: A ΔP corresponding to 44% steam flow at 0% load increasing linearly from 20% load to a value corresponding to ~~116.5~~% steam flow at full load	≤A function defined as follows: A ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load

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114.4

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
Coincident with: Steam Generator Pressure--Low (4) or T_{avg}--Low	≥~~588~~ psig ≥542.5°F	≥~~614~~ psig ≥543°F
2. Containment Spray		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Containment Pressure--High-High Coincident with: Containment Pressure--High	≤22.6 psig ≤4.5 psig	≤20.0 psig ≤4.0 psig
3. Containment Isolation		
a. Phase "A" Isolation		
1) Manual Initiation	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
3) Safety Injection	See Item 1 above for all Safety Injection Allowable Values.	See Item 1 above for all Safety Injection Trip Setpoints.
b. Phase "B" Isolation		
1) Manual Initiation	N.A.	N.A.

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TURKEY POINT – UNITS 3 & 4

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AMENDMENT NOS. 176 AND 170

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
4. Steam Line Isolation (Continued)		
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
c. Containment Pressure--High-High Coincident with: Containment Pressure--High	≤22.6 psig ≤ 4.5 psig	≤20. psig ≤4.0 psig
d. Steam Line Flow--High	≤A function defined as follows: A ΔP corresponding to ~~44~~ 41.2 % steam flow at 0% load increasing linearly from 20% load to a value corresponding to ~~116.5~~ 114.4 % steam flow at full load.	≤A function defined as follows: A ΔP corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 114% steam flow at full load.
Feedwater Coincident with: Steam Line Pressure--Low (4) or T_{avg} -- Low	≥~~588~~ 607 psig ≥542.5°F	≥~~614~~ psig ≥543°F
5. ~~Fedwater~~ Isolation		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Safety Injection	See Item 1. for all Safety Injection Allowable Valves.	See Item 1. above for all Safety Injection Trip Setpoints.

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AMENDMENT NOS. 191 AND 185

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE	TRIP SETPOINT
5. Feedwater Isolation (Continued)		
c. Steam Generator Water Level High-High	80.5 ≤~~81.9~~% of narrow range instrument span	≤80% of narrow range instrument span
6. Auxiliary Feedwater (3)		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Steam Generator Water Level--Low-Low	15.5 ≥~~8.15~~% of narrow range instrument span.	16 ≥~~10~~% of narrow range instrument span
c. Safety Injection	See Item 1. for all Safety Injection Allowable Values.	See Item 1. above for all Safety Injection Trip Setpoints.
d. Bus Stripping	See Item 7. below for all Bus Stripping Allowable Values.	See Item 7. below for all Bus Stripping Trip Setpoints.
e. Trip of All Main Feedwater Pump Breakers	N.A.	N.A.
7. Loss of Power		
a. 4.16 kV Busses A and B (Loss of Voltage)	N.A.	N.A.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE#	TRIP SETPOINT
7. Loss of Power (Continued)		
b. 480V Load Centers Undervoltage		Insert "3" for all Load Centers
Load Center		
3A	[ ]	430V ±~~5~~V (10 sec ±1 sec delay)
3B	[ ]	438V ±~~5~~V (10 sec ±1 sec delay)
3C	[ ]	434V ±~~5~~V (10 sec ±1 sec delay)
3D	[ ]	434V ±~~5~~V (10 sec ±1 sec delay)
4A	[ ]	435V ±~~5~~V (10 sec ±1 sec delay)
4B	[ ]	434V ±~~5~~V (10 sec ±1 sec delay)
4C	[ ]	434V ±~~5~~V (10 sec ±1 sec delay)
4D	[ ]	430V ±~~5~~V (10 sec ±1 sec delay)
Coincident with: Safety Injection and	See Item 1. above for all Safety Injection Allowable Values.	See Item 1. above for all Safety Injection Trip Setpoints.
Diesel Generator Breaker Open	N.A.	N.A.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWABLE VALUE#	TRIP SETPOINT
7. Loss of Power (Continued)		
c. 480V Load Centers Degraded Voltage		Insert "3" for all Load Centers
Load Center		
3A	[ ]	424V ±5V (60 sec ±30 sec delay)
3B	[ ]	427V ±5V (60 sec ±30 sec delay)
3C	[ ]	437V ±5V (60 sec ±30 sec delay)
3D	[ ]	435V ±5V (60 sec ±30 sec delay)
4A	[ ]	430V ±5V (60 sec ±30 sec delay)
4B	[ ]	436V ±5V (60 sec ±30 sec delay)
4C	[ ]	434V ±5V (60 sec ±30 sec delay)
4D	[ ]	434V ±5V (60 sec ±30 sec delay)
Coincident with: Diesel Generator Breaker Open	N.A.	N.A.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

TABLE NOTATIONS

(1) Either the particulate or gaseous channel in the OPERABLE status will satisfy this LCO.

(2) Containment Gaseous Monitor Setpoint = $\frac{(3.2 \times 10^4)}{(\ F\ )}$CPM,

Containment Gaseous Monitor Allowable Value = $\frac{(3.5 \times 10^4)}{(\ F\ )}$CPM,

Where F = $\frac{\text{Actual Purge Flow}}{\text{Design Purge Flow (35,000 CFM)}}$

Setpoint may vary according to current plant conditions provided that the release rate does not exceed allowable limits provided in the Offsite Dose Calculation Manual.

(3) Auxiliary feedwater manual initiation is included in Specification 3.7.1.2.

If no Allowable Value is specified, as indicated by [ ], the trip setpoint shall also be the allowable value.

(4) Time constants utilized in the lead-lag controller for Steam Generator Pressure- Low and Steam Line Pressure-Low are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds. CHANNEL CALIBRATION shall ensure that these time constants are adjusted to these values.

TABLE 4.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST #	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Safety Injection ~~(Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except Manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)~~						
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	1, 2, 3(3)
c. Containment Pressure--High	N.A.	R	N.A.	N.A.	M(1)	1, 2, 3
d. Pressurizer Pressure--Low	S	R	Q(5)	N.A.	N.A.	1, 2, 3(3)
e. High Differential Pressure Between the Steam Line Header and any Steam Line	S	R	Q(5)	N.A.	N.A.	1, 2, 3(3)
f. Steam Line Flow--High Coincident with:	S	R	Q(5)	N.A	N.A	1, 2, 3(3)
Steam Generator Pressure--Low	S	R	Q(5)	N.A.	N.A.	1, 2, 3(3)
or Tavg--Low	S	R	Q(5)	N.A.	N.A.	1, 2, 3(3)

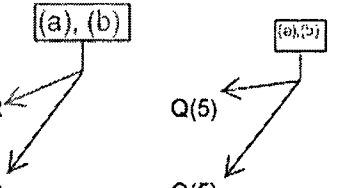

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST #	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. Steamline Isolation (Continued)						
c. Containment Pressure--High-High	N.A.	R	N.A.	R	M(1)	1, 2, 3
Coincident with: Containment Pressure--High	N.A.	R (a),(b)	N.A (a),(b)	R	M(1)	1, 2, 3
d. Steam Line Flow--High	S(3)	R	Q(5)	N.A.	N.A.	1, 2, 3
Coincident with: Steam Generator Pressure--Low	S(3)	R	Q(5)	N.A.	N.A.	1, 2, 3
or Tavg--Low	S(3)	R	Q(5)	N.A.	N.A.	1, 2, 3
5. Feedwater Isolation						
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	R	1, 2
b. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.					3
c. Steam Generator Water Level--High-High	S	R (a),(b)	Q (a),(b)	N.A.	N.A.	1, 2
6. Auxiliary Feedwater (2)						
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	R	1, 2, 3
b. Steam Generator Water Level--Low-Low	S	R (a),(b)	Q (a),(b)	N.A.	N.A.	1, 2, 3

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST #	MODES FOR WHICH SURVEILLANCE IS REQUIRED
8. Engineering Safety Features Actuation System Interlocks						
a. Pressurizer Pressure	N.A.	R	Q(5)	N.A.	N.A.	1, 2, 3(3)
b. Tavg--Low	N.A.	R	Q(5)	N.A.	N.A.	1, 2, 3(3)
9. Control Room Ventilation Isolation						
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	
b. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.					
c. Containment Radioactivity--High	S	R	M	N.A.	N.A.	(4)
d. Containment Isolation Manual Phase A or Manual Phase B	N.A.	N.A.	N.A.	R	N.A.	1, 2, 3, 4
e. Control Room Air Intake Radiation Level	S	R	M	N.A.	N.A.	All

move to new page 3-34a

TABLE NOTATIONS

(1) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.
(2) Auxiliary feedwater manual initiation is included in Specification 3.7.1.2.
(3) The provisions of Specification 4.0.4 are not applicable for entering Mode 3, provided that the applicable surveillances are completed within 96 hours from entering Mode 3.
(4) Applicable in MODES 1, 2, 3, 4 or during CORE ALTERATIONS or movement of irradiated fuel within the containment.
(5) Test of alarm function not required when alarm locked in.

#At least once per 18 months each Actuation Logic Test shall include energization of each relay and verification of OPERABILITY of each relay.

New Page 3/4 3-34a

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

add notes (a), (b)

TABLE NOTATIONS

At least once per 18 months each Actuation Logic Test shall include energization of each relay and verification of OPERABILITY of each relay.

(a) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(b) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTS) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTS are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (field settings) to confirm channel performance. The NTS and methodologies used to determine the as-found and the as-left tolerances are specified in UFSAR Section 7.2.

(1) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(2) Auxiliary feedwater manual initiation is included in Specification 3.7.1.2.

(3) The provisions of Specification 4.0.4 are not applicable for entering Mode 3, provided that the applicable surveillances are completed within 96 hours from entering Mode 3.

(4) Applicable in MODES 1, 2, 3, 4 or during CORE ALTERATIONS or movement of irradiated fuel within the containment.

(5) Test of alarm function not required when alarm locked in.

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