ATTACHMENT 1

TECHNICAL SPECIFICATION MARKUP

AND DESCRIPTION OF THE CHANGES

FPL LETTER L-91-152

Change 1 In Section 2.2, Limiting Safety System Settings, page 2-3, was revised as part of amendment 140/135. This change is identical with that requested in the Reactor Protection System Setpoints (RPSS) proposed licensee amendment (PLA) submitted by Florida Power and Light (FPL) letter L-90-417, dated December 19, 1990. This change request should be deleted from the RPSS PLA since the PLA is identical to the current Technical Specifications, (amendment 140/135).

Change 2 In Table 2.2-1, page 2-4, items 5, 6, 9, and 10 were revised as part of amendment 140/135. These values are identical to those requested by the RPSS PLA except the S value in item 5 was 3.0 instead of the 2.5 requested in the RPSS PLA.

The 2.5 value was generated by the analysis as the result of a change in instrumentation. New upgraded protection channel pressure transmitters with an increase in instrument span from 800 to 1000 psig were added to the Pressurizer Pressure Control System. The justification for this change is provided on page 7 of FP&L letter L-91-86, dated April 3, 1991. This FP&L letter was submitted to amend the Turkey Point Technical Specification 3/4.2.5, Power Distribution Limits, DNB Parameters, Limiting Condition for Operation and the Bases Section 3/4.2.5, Power Distribution Limits, DNB Parameters.

Items 5, 6, 9, and 10 have been removed from the RPSS PLA except for the value of 2.5 for S in item 5 and the associated # footnote. With the changes requested in the RPSS PLA and amendment 140/135 incorporated into Table 2.2-1, the # footnote on page 2-10 is no longer applicable and the # flag associated with Allowable Value was removed from pages 2-4, 2-5 and 2-6.

Change 3 In Table 2.2-1, pages 2-5 and 2-6, items 15.b., 16., 18., 19., and 20 were revised as part of amendment 140/135. These values are identical to those requested by the RPSS PLA. The remaining changes on pages 2-4, 2-5, and 2-6 of the RPSS PLA remain valid. The changes were justified in WCAP 12745 Revision 0. With the changes requested in the RPSS PLA and amendment 140/135 incorporated into Table 2.2-1, the # footnote on page 2-10 is no longer applicable and the # flag associated with Allowable Value was removed from pages 2-4, 2-5 and 2-6.

The ## footnote on page 2.5 has three values which add up to 7.4 %, while the number footnoted is 7.3 %. This difference was due to the rounding of all four numbers to the nearest tenth after the addition was performed.

Change 4 On page 2-7, Table Notations for Table 2.2-1, the changes requested by the RPSS PLA were all incorporated in amendment

140/135 except for the definitions of τ_1, τ_2, and τ_3. These changes were justified in WCAP 12632 and 12745. The terms $\tau_{1,2,3}$ are already defined as lead lag compensator terms and do not require individual definitions. The RPSS PLA needs to be revised to eliminate this page from the request.

Change 5 On page 2-8, Table Notations for Table 2.2-1, the changes requested by the RPSS PLA were incorporated in TS amendment 140/135 except for two typos in amendment 140/135. Under Note 1, f_2 should be f_1. There is no f_2 term in the overtemperature delta-T equation. The f_2 term is in the overpower delta-T equation under Note 3 and is defined under Note 3. In addition, the P^1 term under Note 1 should be $\geq$ 2235 psig and not just = 2235 psig. Changing f_2 to f_1 and P^1 = 2235 psig to $P^1 \geq$ 2235 psig are the only remaining changes needed in the RPSS PLA for page 2-8. The other changes should be removed from the RPSS PLA. These changes were justified in WCAP 12632 and WCAP 12745.

The greater-than-or-equal-to function is provided to aid the technicians. The greater-than-or-equal-to function provides a conservative direction to leave the setpoint if it can not be left on the exact prescribed value.

Change 6 On page 2-9, Table Notations for Table 2.2-1, the changes requested by the RPSS PLA were incorporated in TS amendment 140/135 except the RPSS PLA gave K_4 as $\leq$ 1.09 instead of = 1.09 and K_5 as $\geq$ 0.02 instead of = 0.02. RPSS PLA defined τ_7 as $\geq$ 10 s instead of = 10 s. With the exception of the above three changes, amendment 140/135 incorporated all the changes requested by the RPSS PLA. These changes are justified in WCAP 12745. These three changes will remain in the RPSS PLA. The other changes will be removed from the RPSS PLA. The definitions of τ_3 and τ_6 are not needed and should be deleted.

The greater-than-or-equal-to and the less-than-or-equal-to functions are provided to aid the technicians. The greater-than-or-equal-to and the less-than-or-equal-to functions provide a conservative direction to leave the setpoint if it can not be left on the exact prescribed value.

Change 7 On Page 2-10, Table Notations for Table 2.2-1, all of the changes requested in the RPSS PLA were incorporated in TS amendment 140/135: These changes were justified in WCAPs 12745 and 12632. With the changes requested in the RPSS PLA and amendment 140/135 incorporated into Table 2.2-1, the # footnote on page 2-10 is no longer applicable. With the exception of removing the # footnote, no other changes are need on this page.

Change 8 On page B 2-3 and B 2-3a, all the changes requested by the

RPSS PLA were incorporated except for some word addition-/deletion/substituting changes, paragraph structure changes and one removed comma. These changes were justified by WCAPs 12745 and 12632. The differences between the current TS, (amendment 140/135) and the RPSS PLA are insignificant, therefore no changes should be requested in the RPSS PLA. The request to revise these pages should be removed from the RPSS PLA.

Change 9 For LCO 3.3.2, page 3/4 3-13, all the changes requested by the RPSS PLA were incorporated by amendment 140/135 with the exception of the tense on one word. A review of the wording determined either tense would be correct, therefore the request to revise this page should be removed from the RPSS PLA.

Change 10 For Table 3.3-3, on pages 3/4 3-23, 24, and 25, all the changes requested by the RPSS PLA are still valid. Line items 1.a., 1.b., 1.f. steam line flow-high coincident with T_{avg} --Low, 2.a., 3.a.1), 3.a.2), 3.a.3), 3.b.1), 3.b.2), 3.c.1), 3.c.2), 3.c.3), 4.a., 4.b., 4.f. - steam line flow--high coincident with t_{avg} --low,5.a., 5.b., 6.a., 6.c., 6.d., 6.e., and 7.a. were revised as part of amendment 140/135 and except for some periods missing from the "N. A."s do not need further revision. These items should be removed from the RPSS PLA. The rest of the changes on these pages remain valid.

Change 11 For Table 3.3-3, items 7.b. and 7.c. were revised as part of amendment 138/133. Additional changes requested by the RPSS PLA were made in amendment 140/135. The changes made as part of amendment 138/133 were not covered by the RPSS PLA. No additional changes are needed for these two items. These two items should be deleted from the RPSS PLA.

Change 12 For Table 3.3-3, items 8.b., 9.a., 9.b., 9.d., and the Table Notations were revised in amendment 140/135. These changes were included in the RPSS PLA. An additional change is needed to item 8.b. and the Table Notations. RPSS PLA changes to 8.a., 9.c., and 9.e. are still required. The changes to items 8.b., 9.a., 9.b., and 9.d. should be removed from the RPSS PLA. These changes are justified in WCAP 12745.

Change 13 For the Bases 3/4.3.1 and 3/4.3.2, pages B 3/4 3-1 and B 3/4 3.1a, all changes requested in the RPSS PLA were incorporated in amendment 140/135 except for one deletion (two sentences) and some minor wordsmithing. Because there was no justification for the deletion of the two sentences in WCAP 12745, and because the remaining unincorporated changes were insignificant, the request for changes to the bases for 3/4.3.1 and 3/4.3.2 should be deleted from the RPSS PLA.

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The Reactor Trip System Instrumentation and Interlock Setpoints shall be set consistent with the Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

a. With a Reactor Trip System Instrumentation or Interlock Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 2.2-1, adjust the setpoint consistent with the Trip setpoint value within permissible calibration tolerance.

b. With the Reactor Trip System Instrumentation or Interlock Setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, either:

1. Adjust the Setpoint consistent with the Trip Setpoint value of Table 2.2-1 and determine within 12 hours that Equation 2.2-1 was satisfied for the affected channel, or

2. Declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its setpoint adjusted consistent with the Trip Setpoint value.

EQUATION 2.2-1 $Z + R + S \leq TA$

where:

Z = The value for column Z of Table 2.2-1 for the affected channel,

R = The "as measured" value (in percent span) of rack error for the affected channel,

S = Either the "as measured" value (in percent span) of the sensor error, or the value of Column S (Sensor Error) of Table 2.2-1 for the affected channel, and

TA = The value from Column TA (Total Allowance in % of span) of Table 2.2-1 for the affected channel.

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE (*)
1. Manual Reactor Trip	N.A.	N.A.	N.A.	N.A.	N.A.
2. Power Range, Neutron Flux a. High Setpoint	7.5	4.56	0.0	≤109% of RTP**	≤112.0% of RTP**
b. Low Setpoint	8.3	4.56	0.0	≤25% of RTP**	≤28.0% of RTP**
3. Intermediate Range, Neutron Flux	13.5	8.41	0.0	≤25% of RTP**	≤31% of RTP**
4. Source Range, Neutron Flux	13.9	10.01	0.0	≤10^5 cps	≤1.4 x 10^5 cps
5. Overtemperature ΔT	7.2	4.8	~~3.0~~ 2.5#	See Note 1	See Note 2
6. Overpower ΔT	5.3	3.1	2.0	See Note 3	See Note 4
7. Pressurizer Pressure-Low	4.5	1.12	1.4	≥1835 psig	≥1817 psig
8. Pressurizer Pressure-High	5.5	1.12	1.4	≤2385 psig	≤2403 psig
9. Pressurizer Water Level-High	8.0	6.8	4.0	≤92% of instrument span	≤92.2% of instrument span
10. Reactor Coolant Flow-Low	4.6	2.7	0.8	≥90% of loop design flow*	≥88.7% of loop design flow*
11. Steam Generator Water Level Low-Low	5.0	2.33	1.9	≥15% of narrow range instrument span	≥13.2% of narrow range instrument span

2.0% Span for ΔT (RTDs) and 0.5% for Pressurizer Pressure

*Loop design flow = 89,500 gpm
**RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE (9)
12. Steam/Feedwater Flow Mismatch Coincident With	~~[ ]~~ 20.0	~~[ ]~~ 3.67	~~[ ]~~ 7.3##	Feed Flow ≤ 20% ~~≤0.64 x 10^6 lb/hr~~ below steam flow	Feed Flow ≤ 23.9% ~~≤[ ] x 10^6 lb/hr~~ below steam flow
Steam Generator Water Level-Low	5.0 ~~[ ]~~	2.33 ~~[ ]~~	1.9 ~~[ ]~~	≥15% of narrow range instrument span	≥13.2 ~~[ ]~~% of narrow range instrument span
13. Undervoltage - 4.16 kV Busses A and B	20.0 ~~[ ]~~	1.12 ~~[ ]~~	0.0 ~~[ ]~~	70% bus voltage ~~≥2496 volts each bus~~	69% bus voltage ~~≥[ ] volts each bus~~
14. Underfrequency - Trip of Reactor Coolant Pump Breaker(s) Open	16.4 ~~[ ]~~	0.50 ~~[ ]~~	0.0 ~~[ ]~~	≥56.1 Hz	≥55.9 ~~[ ]~~ Hz
15. Turbine Trip					
a. Auto Stop Oil Pressure	8.6 ~~[ ]~~	1.0 ~~[ ]~~	0.0 ~~[ ]~~	≥45 psig	≥43 ~~[ ]~~ psig
b. Turbine Stop Valve Closure	N.A.	N.A.	N.A.	Fully Closed ***	Fully Closed ***
16. Safety Injection Input from ESF	N.A.	N.A.	N.A.	N. A.	N.A.
17. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	N.A. ~~[ ]~~	N.A. ~~[ ]~~	N.A. ~~[ ]~~	Nominal ~~≥~~1 x 10^{-10} amp	≥6.0×10^{-11} ~~[ ]~~ amps

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

1.7% Span for Steam Line Flow, 2.9% Span for feedwater flow and 2.8% Span for Steam Line pressure

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

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

**RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

TABLE NOTATIONS

NOTE 1: OVERTEMPERATURE ΔT

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

Where:

ΔT	=	Measured ΔT by RTD Instrumentation
$\frac{1 + \tau_1 S}{1 + \tau_2 S}$	=	Lead/Lag compensator on measured ΔT; τ_1=8s, τ_2 =3s
$\frac{1}{1 + \tau_3 S}$	=	Lag compensator on measured ΔT; τ_3 = 0s
ΔT_0	=	Indicated ΔT at RATED THERMAL POWER
K_1	=	1.095;
K_2	=	0.0107/°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 = 3 s;
T	=	Average temperature, °F;
$\frac{1}{1 + \tau_6 S}$	=	Lag compensator on measured T_{avg}; τ_6 = 0s
T'	$\leq$	574.2°F (Nominal T_{avg} at RATED THERMAL POWER);
K_3	=	0.000453/psig;
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};

and f_2 (ΔI) 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 - 14% and + 10%, f_1 (ΔI) = 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 - 14%, the ΔT Trip Setpoint shall be automatically reduced by 1.5% of its value at RATED THERMAL POWER; and

(3) For each percent that the magnitude of $q_t - q_b$ exceeds + 10%, the ΔT Trip Setpoint shall be automatically reduced by 1.5% of its value at RATED THERMAL POWER.

NOTE 2: The channels maximum trip setpoint shall not exceed its computed setpoint by more than 1.5% of instrument span.

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 3: (Continued)

K_6	=	0.00068/°F for $T > T''$ and $K_6 = 0$ for $T \leq T''$,
T	=	As defined in Note 1,
T''	=	Indicated T_{avg} at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, ≤ 574.2°F),
S	=	As defined in Note 1, and
f_2 (ΔI)	=	0 for all ΔI

NOTE 4: The channel's maximum trip setpoint shall not exceed its computed trip setpoint by more than 1.4% of instrument span.

If no allowable value and no allowance (TA), Z, or S is specified as indicated by [ ], the trip setpoint shall also be the allowable value.

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 3: OVERPOWER ΔT

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

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,

τ_3 = As defined in Note 1,

ΔT_o = As defined in Note 1,

K_4 $\leq$ 1.09,

K_5 $\geq$ 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 rate-lag compensator for T_{avg} dynamic compensation,

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

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

τ_6 = As defined in Note 1,

2.2.1 REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

The Reactor Trip Setpoint Limits specified in Table 2.2-1 are the nominal values at which the Reactor trips are set for each functional unit. The Trip Setpoints have been selected to ensure that the core and Reactor Coolant System are prevented from exceeding their safety limits during normal operation and design basis anticipated operational occurrences and to assist the Engineered Safety Features Actuation System in mitigating the consequences of accidents. The setpoint for a reactor trip system or interlock function is considered to be adjusted consistent with the nominal value when the "as measured" setpoint is within the band allowed for calibration accuracy.

To accommodate the instrument drift that may occur between operational tests and the accuracy to which setpoints can be measured and calibrated, Allowable Values for the Reactor Trip Setpoints have been specified in Table 2.2-1. Operation with setpoints less conservative than the Trip Setpoint but within the specified Allowable Value is acceptable since an allowance has been made in the safety analysis to accommodate this error. If no value is listed in the Allowable column, the setpoint value is the limiting setting.

For some functions, an optional provision has been included for determining the OPERABILITY of a channel when its trip setpoint is found to exceed the Allowable Value. The methodology of this option utilizes the "as measured" deviation from the specified calibration point for rack and sensor components in conjunction with a statistical combination of the other uncertainties in calibrating the instrumentation. In Equation 2.2-1, $Z + R + S \leq TA$, the interactive effects of the errors in the rack and the sensor, and the "as measured" values of the errors are considered. Z, as specified in Table 2.2-1, in percent span, is the statistical summation of errors assumed in the analysis excluding those associated with the sensor and rack drift and the accuracy of their measurement. TA or Total Allowance is the difference, in percent span, between the trip setpoint and the value used in the analysis for reactor trip. R or Rack Error is the "as measured" deviation, in percent span, for the affected channel from the specified trip setpoint. S or Sensor Drift is either the "as measured" deviation of the sensor from its calibration point or the value specified in Table 2.2-1, in percent span, from the analysis assumptions. Use of Equation 2.2-1 allows for a sensor drift factor, an increased rack drift factor, and provides a threshold value for REPORTABLE EVENTS.

The methodology to derive the Trip Setpoints includes an allowance for instrument uncertainties. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensor and other instrumentation utilized in these channels are expected to be capable of operating within the allowances of these uncertainty magnitudes.

Rack drift in excess of the Allowable Value exhibits the behavior that the rack has not met its allowance. Being that there is a small statistical chance

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that this will happen, an infrequent excessive drift is expected. Rack or sensor drift, in excess of the allowance that is more than occasional, may be indicative of more serious problems and should warrant further investigation.

The various Reactor trip circuits automatically open the Reactor trip breakers whenever a condition monitored by the Reactor Trip System reaches a preset or calculated level. In addition to redundant channels and trains, the design approach provides a Reactor Trip System which monitors numerous system variables, therefore providing Trip System functional diversity. The functional capability at the specified trip setting is required for those anticipatory or diverse Reactor trips for which no direct credit was assumed in the safety analysis to enhance the overall reliability of the Reactor Trip System. The Reactor Trip System initiates a Turbine trip signal whenever Reactor trip is initiated. This prevents the reactivity insertion that would otherwise result from excessive Reactor Coolant System cooldown and thus avoids unnecessary actuation of the Engineered Safety Features Actuation System.

Manual Reactor Trip

The Reactor Trip System includes manual Reactor trip capability.

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-2 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-3.

APPLICABILITY: As shown in Table 3.3-2.

ACTION:

a. With an ESFAS Instrumentation or Interlock Trip Setpoint trip less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 3.3-3, adjust the Setpoint consistent with the Trip Setpoint value within permissible calibration tolerance.

b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Value column of Table 3.3-3, either:

1. Adjust the Setpoint consistent with the Trip Setpoint value of Table 3.3-3 and determine within 12 hours that Equation 2.2-1 was satisfied for the affected channel, or

2. Declare the channel inoperable and apply the applicable ACTION statement requirements of Table 3.3-2 until the channel is restored to OPERABLE status with its setpoint adjusted consistent with the Trip Setpoint value.

EQUATION 2.2-1 $$Z + R + S \leq TA$$

where:

Z = The value for column Z of Table 3.3-3 for the affected channel,

R = The "as measured" value (in percent span) of rack error for the affected channel,

S = Either the "as measured" value (in percent span) of the sensor error, or the value of Column S (Sensor Error) of Table 3.3-3 for the affected channel, and

TA = The value from Column TA (Total Allowance in % of span) of Table 3.3-3 for the affected channel.

c. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-2.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated OPERABLE by performance of the ESFAS Instrumentation Surveillance Requirements specified in Table 4.3-2.

TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
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.	N.A.	N.A.
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	N.A.
c. Containment Pressure--High	~~[ ]~~ 2.0	~~[ ]~~ 0.2	~~[ ]~~ 0.0	≤~~6~~ 4.0 psig	≤~~[ ]~~ 5.5 psig
d. Pressurizer Pressure--Low	~~[ ]~~ 13.0	~~[ ]~~ 3.4	~~[ ]~~ 1.4	≥~~1715~~ 1730 psig	≥~~[ ]~~ 1712 psig
e. High Differential Pressure Between the Steam Line Header and any Steam Line.	~~[ ]~~ 4.7	~~[ ]~~ 1.57	~~[ ]~~ 4.60*	≤~~150~~ 100 psi	≤~~[ ]~~ 114 psi
f. Steam Line Flow--High	~~[ ]~~ 16.7	~~[ ]~~ 2.86	~~[ ]~~ 3.9	<A function defined as follows: A Δp corresponding to ~~0.64 x 10^6 lbs/hr~~ 40% steam flow at 0% load increasing linearly ~~to a Δp corresponding to 3.84 x 10^6 lbs/hr~~ from 20% load to a value 120% steam flow at full load.	~~[ ]~~ ≤A function defined as follows: A Δp corresponding to 42.6% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 122.6% steam flow at full load

* 2.3% Span for each sensor

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
Coincident with: Steam Generator Pressure--Low	~~[ ]~~ 13.0	~~[ ]~~ 1.16	~~[ ]~~ 2.3	≥~~600~~ 614 psig	≥~~[ ]~~ 588 psig
or					
T_{avg}--Low	4.0	2.0	1.0	≥543°F	≥542.5°F
2. Containment Spray					
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
b. Containment Pressure--High-High Coincident with:	~~[ ]~~ 10.0	~~[ ]~~ 1.6	~~[ ]~~ 0.0	≤~~30.0~~ 20 psig	≤~~[ ]~~ 21.4 psig
Containment Pressure--High	~~[ ]~~ 2.0	~~[ ]~~ 0.2	~~[ ]~~ 0.0	≤~~6.0~~ 4.0 psig	≤~~[ ]~~ 5.5 psig
3. Containment Isolation					
a. Phase "A" Isolation					
1) Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
3) Safety Injection	see item 1			See Item 1 above for all Safety Injection Trip Setpoints and Allowable Values.	
b. Phase "B" Isolation					
1) Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
3. Containment Isolation (Continued)					
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
3) Containment Pressure--High-High	10.0 ~~[ ]~~	1.6 ~~[ ]~~	0.0 ~~[ ]~~	≤20 ~~30.0~~ psig	≤21.4 ~~[ ]~~ psig
Coincident with: Containment Pressure--High	2.0 ~~[ ]~~	0.2 ~~[ ]~~	0.0 ~~[ ]~~	≤4.0 ~~6.0~~ psig	≤5.5 ~~[ ]~~ psig
c. Containment Ventilation Isolation					
1) Containment Isolation Manual Phase A or Manual Phase B	N.A.	N.A.	N.A.	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
3) Safety Injection	see item 1			See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
4) Containment Radio-activity--High (1)	N.A. ~~[ ]~~	N.A. ~~[ ]~~	N.A. ~~[ ]~~	Particulate (R-11) $<6.1 \times 10^5$ CPM Gaseous (R-12) See (2)	~~[ ]~~ Particulate (R-11) $\leq 6.8 \times 10^5$ CPM Gaseous (R-12) See (2)
4. Steam Line Isolation					
a. Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
4. Steam Line Isolation (Continued)					
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
c. Containment Pressure--High-High Coincident with:	~~[ ]~~ 10.0	~~[ ]~~ 1.6	~~[ ]~~ 0.0	≤~~30.0~~ 20 psig	≤~~[ ]~~ 21.4 psig
Containment Pressure--High	[ ] 2.0	~~[ ]~~ 0.2	~~[ ]~~ 0.0	≤~~6.0~~ 4.0 psig	≤~~[ ]~~ 5.5 psig
f. Steam Line Flow--High	[ ] 16.7	~~[ ]~~ 2.86	~~[ ]~~ 3.9	≤A function defined as follows: A Δp corresponding to ~~0.64 x 10⁶ lbs/hr~~ 40% steamflow at 0% load increasing linearly ~~to a Δp corresponding to 3.84 x 10⁶ lbs/hr~~ from 20% load to a value corresponding to 120% steam flow at full load.	~~[ ]~~ ≤A function defined as follows: A Δp corresponding to 42.6% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 122.6% steam flow at full load
Coincident with: Steam Line Pressure--Low	~~[ ]~~ 13.0	~~[ ]~~ 1.16	~~[ ]~~ 2.3	≥~~600~~ 614 psig	≥~~[ ]~~ 588 psig
or T_{avg}--Low	4.0	2.0	1.0	≥543°F	≥542.5°F
5. Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
b. Safety Injection	see item 1			See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
6. Auxiliary Feedwater (3)					
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
b. Steam Generator Water Level--Low-Low	5.0 ~~[ ]~~	2.33 ~~[ ]~~	1.9 ~~[ ]~~	≥15% of narrow range instrument span.	≥~~[ ]~~ 13.2% of narrow range instrument span.
c. Safety Injection	see item 1			See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
d. Bus Stripping	see item 7			See Item 7. below for all Bus Stripping Setpoints and Allowable Values.	
e. Trip of All Main Feedwater Pump Breakers.	N.A.	N.A.	N.A.	N.A.	N.A.
7. Loss of Power					
a. 4.16 kV Busses A and B (Loss of Voltage)	N.A	N.A.	N.A	N.A.	N.A.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
7. Loss of Power (Continued)					
b. 480V Load Centers (Instantaneous Relays) Degraded Voltage					
Load Center					
3A	[ ]	[ ]	[ ]	418V±5V (10 sec ± 1 sec delay)	[ ]
3B	[ ]	[ ]	[ ]	423V±5V (10 sec ± 1 sec delay)	[ ]
3C	[ ]	[ ]	[ ]	429V±5V (10 sec ± 1 sec delay)	[ ]
3D	[ ]	[ ]	[ ]	429V±5V (10 sec ± 1 sec delay)	[ ]
4A	[ ]	[ ]	[ ]	407V±5V (10 sec ± 1 sec delay)	[ ]
4B	[ ]	[ ]	[ ]	423V±5V (10 sec ± 1 sec delay)	[ ]
4C	[ ]	[ ]	[ ]	419V±5V (10 sec ± 1 sec delay)	[
4D	[ ]	[ ]	[ ]	404V±5V (10 sec ± 1 sec delay)	[ ]
Coincident with: Safety Injection and	see item 1			See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
Diesel Generator Breaker Open				N.A.	N.A.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
7. Loss of Power (Continued)					
c. 480V Load Centers (Inverse Time Relays) Degraded Voltage					
Load Center					
3A	[ ]	[ ]	[ ]	416V±5V(60 sec ±30 sec delay)	[ ]
3B	[ ]	[ ]	[ ]	426V±5V(60 sec ±30 sec delay)	[ ]
3C	[ ]	[ ]	[ ]	436V±5V(60 sec ±30 sec delay)	[ ]
3D	[ ]	[ ]	[ ]	437V±5V(60 sec ±30 sec delay)	[ ]
4A	[ ]	[ ]	[ ]	424V±5V(60 sec ±30 sec delay)	[ ]
4B	[ ]	[ ]	[ ]	422V±5V(60 sec ±30 sec delay)	[ ]
4C	[ ]	[ ]	[ ]	433V±5V(60 sec ±30 sec delay)	[ ]
4D	[ ]	[ ]	[ ]	432V±5V(60 sec ±30 sec delay)	[ ]
Coincident with: Diesel Generator Breaker Open	N.A.	N.A.	N.A	N.A.	N.A.

[illegible]

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	ALLOWANCE (TA)	Z	S	TRIP SETPOINT	ALLOWABLE VALUE#
8. Engineering Safety Features Actuation System Interlocks					
a. Pressurizer Pressure	N.A. ~~[ ]~~	N.A ~~[ ]~~	N.A. ~~[ ]~~	Nominal ≥ 2000 psig	≤ ~~[ ]~~ 2018 psig
b. T_{avg}--Low	4.0	2.0	1.0	Nominal ≥ 543°F	≥542.5 °F
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			See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
c. Containment Radioactivity--High (1)	N.A. ~~[ ]~~	N.A ~~[ ]~~	N.A. ~~[ ]~~	Particulate (R-11) <6.1 x 10^5 CPM Gaseous (R-12) See (2)	~~[ ]~~ Particulate (R-11) ≤ 6.8 x 10^5 CPM Gaseous (R-12) see (2)
d. Containment Isolation Manual Phase A or Manual Phase B	N.A.	N.A.	N.A.	N.A.	N.A.
e. Air Intake Radiation Level	N.A. ~~[ ]~~	N.A. ~~[ ]~~	N.A ~~[ ]~~	≤ 2 mR/hr	≤ 2.83 mR/hr

TABLE NOTATIONS

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

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

TABLE NOTATIONS (continued)

(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 Specification 3.11.2.1.

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

#If no allowable value, ALLOWANCE (TA), Z or S is specified so indicated by [ ], the trip setpoint shall also be the allowable value.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

The OPERABILITY of the Reactor Trip System and the Engineered Safety Features Actuation System instrumentation and interlocks ensures that: (1) the associated ACTION and/or Reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its Setpoint (2) the specified coincidence logic is maintained, (3) sufficient redundancy is maintained to permit a channel to be out-of-service for testing or maintenance (due to plant specific design, pulling fuses and using jumpers may be used to place channels in trip), and (4) sufficient system functional capability is available from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the safety analyses. The Surveillance Requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability.

Under some pressure and temperature conditions, certain surveillances for Safety Injection cannot be performed because of the system design. Allowance to change modes is provided under these conditions as long as the surveillances are completed within specified time requirements.

The Engineered Safety Features Actuation System Instrumentation Trip Setpoints specified in Table 3.3-3 are the nominal values at which the bistables are set for each functional unit. The setpoint is considered to be adjusted consistent with the nominal value when the "as measured" setpoint is within the band allowed for calibration accuracy.

To accommodate the instrument drift that may occur between operational tests and the accuracy to which Setpoints can be measured and calibrated, Allowable Values for the Setpoints have been specified in Table 3.3-3. Operation with Setpoints less conservative than the Trip Setpoint but within the Allowable Value is acceptable since an allowance has been made in the safety analysis to accommodate this error. If no value is listed in the Allowable column, the Setpoint value is the limiting setting.

For some functions, an optional provision has been included for determining the OPERABILITY of a channel when its trip setpoint is found to exceed the Allowable Value. The methodology of this option utilizes the "as measured" deviation from the specified calibration point for rack and sensor components in conjunction with a statistical combination of the other uncertainties of the instrumentation to measure the process variable and the uncertainties in calibrating the instrumentation. In Equation 2.2-1, $Z + R + S \leq TA$, the interactive effects of the errors in the rack and the sensor, and the "as measured"

REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (Continued)

values of the errors are considered. Z, as specified in Table 3.3-3, in percent span, is the statistical summation of errors assumed in the analysis excluding those associated with the sensor and rack drift and the accuracy of their measurement. TA or Total Allowance is the difference, in percent span, between the trip setpoint and the value used in the analysis for actuation. R or Rack Error is the "as measured" deviation, in percent span, for the affected channel from the specified trip setpoint. S or Sensor Drift is either the "as measured" deviation of the sensor from its calibration point or the value specified in Table 3.3-3, in percent span, from the analysis assumptions. Use of Equation 2.2-1 allows for a sensor drift factor, an increased rack drift factor, and provides a threshold value for REPORTABLE EVENTS.

The methodology to derive the Trip Setpoints includes an allowance for instrument uncertainties. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensor and rack instrumentation utilized in these channels are expected to be capable of operating within the allowances of these uncertainty magnitudes.

Rack drift in excess of the Allowable Value exhibits the behavior that the rack has not met its allowance. Being that there is a small statistical chance that this will happen, an infrequent excessive drift is expected. Rack or sensor drift, in excess of the allowance that is more than occasional, may be indicative of more serious problems and should warrant further investigation.

The Engineered Safety Features Actuation System senses selected plant parameters and determines whether or not predetermined limits are being exceeded. If they are, the signals are combined into logic matrices sensitive to combinations indicative of various accidents events, and transients. Once the required logic combination is completed, the system sends actuation signals to