ATTACHMENT B

PROPOSED CHANGES TO APPENDIX A
TECHNICAL SPECIFICATIONS FOR FACILITY
OPERATING LICENSES NPF-37, -66,-72, AND -77

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2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR T... SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The Reactor Trip System Instrumentation and Interlock Setpoints shall be set consistent within 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.

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 $Z + RE + SE \leq TA$~~

~~Where:~~

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

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

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

~~TA = The value for Column TA (Total Allowance) of Table 2.2-1 for the affected channel~~

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	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~~	≤109% of RTP*	≤~~111.1~~ 111.36% of RTP*
b. Low Setpoint	~~8.3~~	~~4.56~~	~~0~~	≤25% of RTP*	≤~~27.1~~ 27.36% of RTP*
3. Power Range, Neutron Flux, High Positive Rate	~~1.6~~	~~0.5~~	~~0~~	≤5% of RTP* with a time constant ≥2 seconds	≤6.3% of RTP* with a time constant ≥2 seconds
4. Power Range, Neutron Flux, High Negative Rate	~~1.6~~	~~0.5~~	~~0~~	≤5% of RTP* with a time constant ≥2 seconds	≤6.3% of RTP* with a time constant ≥2 seconds
5. Intermediate Range, Neutron Flux	~~17.0~~	~~8.4~~	~~0~~	≤25% of RTP*	≤~~30.9~~ 31.5% of RTP*
6. Source Range, Neutron Flux	~~17.0~~	~~10.0~~	~~0~~	$\leq 10^5$ cps	≤~~1.4~~ 1.42 $\times 10^5$ cps
7. Overtemperature ΔT	~~27.2~~	~~5.38~~	~~See Note 5~~	See Note 1	See Note 2
8. Overpower ΔT	~~4.3~~	~~1.3~~	~~1.2~~	See Note 3	See Note 4
9. Pressurizer Pressure-Low	~~5.0~~	~~2.21~~	~~1.5~~	≥1885 psig	≥~~1871~~ 1869 psig
10. Pressurizer Pressure-High	~~3.1~~	~~0.71~~	~~1.5~~	≤2385 psig	≤~~2396~~ 2393 psig
11. Pressurizer Water Level-High	~~5.0~~	~~2.18~~	~~1.5~~	≤92% of instrument span	≤~~93.8~~ 93.5% of instrument span

*RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	Z	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
12. Reactor Coolant Flow-Low	~~2.5~~	1.77	~~0.6~~	≥90% of loop minimum measured flow*	≥~~89.2~~ 89.3% of loop minimum measured flow*
13. Steam Generator Water Level Low-Low					
a. Unit 1	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥33.0% of narrow range instrument span	≥31.0% of narrow range instrument span
b. Unit 2	~~N.A~~	~~N.A~~	~~N.A.~~	≥36.3% of narrow range instrument span	≥~~35.4~~ 34.8% of narrow range instrument span
14. Undervoltage - Reactor Coolant Pumps	~~12.0~~	~~0.7~~	~~0~~	≥5268 volts - each bus	≥~~4728~~ 4920 volts - each bus
15. Underfrequency - Reactor Coolant Pumps	~~14.4~~	~~13.3~~	~~0~~	≥57.0 Hz	≥~~56.5~~ 56.08 Hz
16. Turbine Trip					
a. Emergency Trip Header Pressure	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥540 psig	≥~~520~~ 815 psig
b. Turbine Throttle Valve Closure	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥1% open	≥1% open
17. Safety Injection Input from ESF	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
18. Reactor Coolant Pump Breaker Position Trip	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.

*Minimum measured flow = 97,600 gpm

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
19. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	~~N.A.~~	~~N.A.~~	~~N.A.~~	$\geq 1 \times 10^{-10}$ amp	$\geq 6 \times 10^{-11}$ amp
b. Low Power Reactor Trips Block, P-7					
1) P-10 input	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤10% of RTP*	≥7.9% to ≤12.1% of RTP*
2) P-13 input	~~N.A.~~	~~N.A.~~	~~N.A.~~	<10% RTP* Turbine Impulse Pressure Equivalent	<12.1% RTP* Turbine Impulse Pressure Equivalent
c. Power Range Neutron Flux, P-8	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤30% of RTP*	≤32.1% of RTP*
d. Power Range Neutron Flux, P-10	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤10% of RTP*	≥7.9% to ≤12.1% of RTP*
e. Turbine Impulse Chamber Pressure, P-13	~~N.A.~~	~~N.A.~~	~~N.A.~~	<10% RTP* Turbine Impulse Pressure Equivalent	<12.1% RTP* Turbine Impulse Pressure Equivalent
20. Reactor Trip Breakers	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
21. Automatic Trip and Interlock Logic	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
22. Reactor Trip Bypass Breakers	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.

*RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

τ_6	=	Time constant utilized in the measured T_{avg} lag compensator, τ_6 = 0 s,
T'	$\leq$	588.4°F (Nominal T_{avg} at RATED THERMAL POWER),
K_3	=	0.00134,
P	=	Pressurizer pressure, psig,
P'	=	2235 psig (Nominal RCS operating pressure),
S	=	Laplace transform operator, s^{-1},

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:

(i) for $q_t - q_b$ between ~~-[illegible]% and +10% (Unit 1 Cycle 3 and Unit 2 Cycle 2), and~~ -32% and +13% (~~Unit 1 Cycle 4 and after; Unit 2 Cycle 3 and after~~), $f_1(\Delta I)$ = 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;

(ii) for each percent that the magnitude of $q_t - q_b$ exceeds ~~+10% (Unit 1 Cycle 3 and Unit 2 Cycle 2),~~ ~~and~~ +13% (~~Unit 1 Cycle 4 and after; Unit 2 Cycle 3 and after~~), the ΔT Trip Setpoint shall be automatically reduced by ~~2.0% (Unit 1 Cycle 3 and Unit 2 Cycle 2), and~~ 1.74% (~~Unit 1 Cycle 4 and after; Unit 2 Cycle 3 and after~~) of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $q_t - q_b$ exceeds -32%, the ΔT Trip Setpoint shall be automatically reduced by 1.67% of its value at RATED THERMAL POWER ~~(Unit 1 Cycle 4 and after; Unit 2 Cycle 3 and after)~~

NOTE 2: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than ~~3.9%~~ 3.4 of ΔT span.

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 3: (Continued)

K_6	=	0.00170/°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, $\leq$ 588.4°F),
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 ~~2.6%~~ of ΔT span.
2.3

~~NOTE 5: The sensor error for temperature is 1.2 and for pressure is 1.0.~~

2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

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 assumed to 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 Allowable Value is acceptable since an allowance has been made in the safety analysis to accommodate this error. 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, $Z + RE + SE \leq TA$, 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. RE or Rack Error is the "as measured" deviation, in percent span, for the affected channel from the specified Trip Setpoint. SE or Sensor Error 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 is based upon combining all of the uncertainties in the channels. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensors 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 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.

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Features Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS Instrumentation or Interlock Trip 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 3.3-4 adjust the Setpoint consistent with the Trip Setpoint value.

b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~either:~~

~~1. Adjust the Setpoint consistent with the Trip Setpoint value of Table 3.3-4 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 3.3-3 until the channel is restored to OPERABLE status with its Setpoint adjusted consistent with the Trip Setpoint value.

~~Equation 2.2-1~~ ~~$Z + RE + SE \leq TA$~~

~~Where:~~

~~Z = The value from Column Z of Table 3.3-4 for the affected channel,~~

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

~~SE = Either the "as measured" value (in percent span) of the sensor error, or the value for Column SE (Sensor Error) of Table 3.3-4 for the affected channel, and~~

~~TA = The value from Column TA (Total Allowance) of Table 3.3-4 for the affected channel.~~

c. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

TABLE 3.3-4

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)	TRIP SETPOINT	ALLOWABLE VALUE
1. Safety Injection (Reactor Trip, Feedwater Isolation, Start Diesel Generators, Containment Cooling Fans, Control Room Isolation, Phase "A" Isolation, Turbine Trip, Auxiliary Feedwater, Containment Vent Isolation and Essential Service Water)					
a. Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
c. Containment Pressure-High-1	5.7	0.71	1.5	≤ 3.4 psig	≤ 5.0 [4.6] psig
d. Pressurizer Pressure-Low (Above P-11)	16.1	14.41	1.5	≥ 1829 psig	≥ 1823 [1813] psig
e. Steam Line Pressure-Low (Above P-11)	21.2	14.81	1.5	≥ 640 psig*	≥ 617 [614] psig*
2. Containment Spray					
a. Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
c. Containment Pressure-High-3	8.0	0.71	1.5	≤ 20.0 psig	≤ 21.0 [illegible] psig

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
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. 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.
2) Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
3) Containment Pressure-High-3	~~8.0~~	~~0.71~~	~~1.5~~	≤ 20.0 psig	≤ ~~21.0~~ 21.2 psig
c. Containment Vent Isolation					
1) Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
2) Manual Phase "A" Isolation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
3) Manual Phase "B" Isolation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
4) Safety Injection	See Item 1 above for all Safety Injection Trip Setpoints and Allowable Values.				

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
4. Steam Line Isolation					
a. Manual Initiation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Containment Pressure-High-2	~~7.7~~	~~0.71~~	~~1.5~~	≤8.2 psig	9.4 ≤~~9.2~~ psig
d. Steam Line Pressure-Low (Above P-11)	~~21.2~~	~~14.81~~	~~1.5~~	≥640 psig*	611 ≥~~617~~ psig*
e. Steam Line Pressure Negative Rate-High (Below P-11)	~~8.0~~	~~0.5~~	~~0~~	≤100 psi**	165.3 ≤~~111.5~~ psi**
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Steam Generator Water Level-High-High (P-14)					
1) Unit 1	~~6.0~~	~~4.28~~	~~1.5~~	≤81.4% of narrow range instrument span	83.4 ≤~~82.7~~% of narrow range instrument span
2) Unit 2	~~18.9~~	~~12.02~~	~~3.2~~	≤80.8% of narrow range instrument span	≤82.8% of narrow range instrument span

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
5. Turbine Trip and Feedwater Isolation (continued)					
c. Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				
6. Auxiliary Feedwater					
a. Manual Initiation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Steam Generator Water Level-Low-Low-Start Motor-Driven Pump and Diesel-Driven Pump					
1) Unit 1	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥33.0% of narrow range instrument span	≥31.0% of narrow range instrument span
2) Unit 2	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥36.3% of narrow range instrument span	≥~~35.4%~~ 34.8 of narrow range instrument span
d. Undervoltage-RCP Bus-Start Motor Driven Pump and Diesel-Driven Pump	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥5268 volts	≥~~4728~~ 4920 volts
e. Safety Injection-Start Motor-Driven Pump and Diesel-Driven Pump	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)	TRIP SETPOINT	ALLOWABLE VALUE
6. Auxiliary Feedwater (Continued)					
f. Division 11 for Unit 1 (Division 21 for Unit 2) ESF Bus Undervoltage-Start Motor-Driven Pump	N.A.	N.A.	N.A.	2870 volts	2730 volts
g. Auxiliary Feedwater Pump Suction Pressure-Low (Transfer to Essential Service Water)	N.A.	N.A.	N.A.	1.22" Hg vac	2" Hg vac
7. Automatic Opening of Containment Sump Suction Isolation Valves					
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
b. RWST Level-Low-Low	N.A.	N.A.	N.A.	46.7%	44.7%
Coincident with Safety Injection	See Item 1. above for Safety Injection Trip Setpoints and Allowable Values.				

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
8. Loss of Power					
a. ESF Bus Undervoltage	~~N.A.~~	~~N.A.~~	~~N.A.~~	2870 volts w/1.8s delay	≥2730 volts w/≤1.9s delay
b. Grid Degraded Voltage	~~N.A.~~	~~N.A.~~	~~N.A.~~	3804 volts w/310s delay	≥3728 volts w/310 ± 30s delay
9. Engineered Safety Feature Actuation System Interlocks					
a. Pressurizer Pressure, P-11	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤1930 psig	≤1936 psig
b. Reactor Trip, P-4	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Low-Low T_{avg}, P-12	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥550°F	≥~~547.6~~ 547.2°F
d. Steam Generator Water Level, P-14 (High-High)	See Item 5.b. above for all Steam Generator Water Level Trip Setpoints and Allowable Values.				

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, 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.

The Engineered Safety Features Actuation System Instrumentation Trip Setpoints specified in Table 3.3-4 are the nominal values at which the bistables are set for each functional unit. A 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 assumed to 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 3.3-4. 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. ~~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 3.3-1, Z + RE + SE ≤ 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 3.3-4, 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 the actuation. RE or Rack Error is the "as measured" deviation, in percent span, for the affected channel from the specified Trip Setpoint. SE or Sensor Error is either~~

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

~~the "as measured" deviation of the sensor from its calibration point or the value specified in Table 3.3-4, in percent span, from the analysis assumptions. Use of Equation 3.3-1 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 is based upon combining all of the uncertainties in the channels. 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 statisitical 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 measurement of response time at the specified frequencies provides assurance that the Reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response times.

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 those Engineered Safety Features components whose aggregate function best serves the requirements of the condition. As an example, the following actions may be initiated by the Engineered Safety Features Actuation System to mitigate the consequences of a steam line break or loss of coolant accident: (1) Safety Injection pumps start and automatic valves position, (2) Reactor trip, (3) feedwater isolation, (4) startup of the emergency diesel generators, (5) containment spray pumps start and automatic valves position, (6) containment isolation, (7) steam line isolation, (8) Turbine trip, (9) auxiliary feedwater pumps start and automatic valves position, (10) containment cooling fans start and automatic valves position, and (11) essential service water pumps start and automatic valves position.

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 within 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.

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 $Z + RE + SE \leq TA$~~

~~Where:~~

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

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

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

~~TA = The value for Column TA (Total Allowance) of Table 2.2-1 for the affected channel.~~

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	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~~	≤109% of RTP*	≤~~111.1%~~ 111.36 of RTP*
b. Low Setpoint	~~8.3~~	~~4.56~~	~~0~~	≤25% of RTP*	≤~~27.1%~~ 27.36 of RTP*
3. Power Range, Neutron Flux, High Positive Rate	~~1.6~~	~~0.5~~	~~0~~	≤5% of RTP* with a time constant ≥2 seconds	≤6.3% of RTP* with a time constant ≥2 seconds
4. Power Range, Neutron Flux, High Negative Rate	~~1.6~~	~~0.5~~	~~0~~	≤5% of RTP* with a time constant ≥2 seconds	≤6.3% of RTP* with a time constant ≥2 seconds
5. Intermediate Range, Neutron Flux	~~17.0~~	~~8.4~~	~~0~~	≤25% of RTP*	≤~~30.9%~~ 31.5 of RTP*
6. Source Range, Neutron Flux	~~17.0~~	~~10.0~~	~~0~~	≤10^5 cps	≤~~1.4~~ 1.42 x 10^5 cps
7. Overtemperature ΔT	~~27.7~~	~~5.38~~	~~See Note 5~~	See Note 1	See Note 2
8. Overpower ΔT	~~4.3~~	~~1.3~~	~~1.2~~	See Note 3	See Note 4
9. Pressurizer Pressure-Low	~~5.0~~	~~2.21~~	~~1.5~~	≥1885 psig	≥~~1871~~ 1869 psig
10. Pressurizer Pressure-High	~~3.1~~	~~0.71~~	~~1.5~~	≤2385 psig	≤~~2396~~ 2393 psig
11. Pressurizer Water Level-High	~~5.0~~	~~2.18~~	~~1.5~~	≤92% of instrument span	≤~~93.8%~~ 93.5 of instrument span

*RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
12. Reactor Coolant Flow-Low	~~2.5~~	~~1.77~~	~~0.6~~	≥90% of loop minimum measured flow*	≥~~89.2%~~ 89.3 of loop minimum measured flow*
13. Steam Generator Water Level Low-Low					
a. Unit 1	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥33.0% of narrow range instrument span	≥31.0% of narrow range instrument span
b. Unit 2	~~17.0 (Cycle 3)~~ ~~N.A. (Cycle 4 and after)~~	~~14.78 (Cycle 3)~~ ~~N.A. (Cycle 4 and after)~~	~~1.5 (Cycle 3)~~ ~~N.A. (Cycle 4 and after)~~	≥17% (Cycle 3); ≥36.3% (Cycle 4 and after) of narrow range instrument span	≥~~15.3%~~ 16.3 (Cycle 3); ≥~~35.4%~~ 34.8 (Cycle 4 and after) of narrow range instrument span
14. Undervoltage - Reactor Coolant Pumps	~~12.0~~	~~0.7~~	~~0~~	≥5268 volts - each bus	≥~~4728~~ 4920 volts - each bus
15. Underfrequency - Reactor Coolant Pumps	~~14.4~~	~~13.3~~	~~0~~	≥57.0 Hz	≥~~56.5~~ 56.03 Hz
16. Turbine Trip					
a. Emergency Trip Header Pressure	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥~~540~~ 1000 psig	≥~~520~~ 815 psig
b. Turbine Throttle Valve Closure	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥1% open	≥1% open
17. Safety Injection Input from ESF	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
18. Reactor Coolant Pump Breaker Position Trip	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.

*Minimum measured flow = 97,600 gpm

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (S)~~	TRIP SETPOINT	ALLOWABLE VALUE
19. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥1 x 10^{-10} amp	≥6 x 10^{-11} amp
b. Low Power Reactor Trips Block, P-7					
1) P-10 input	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤10% of RTP*	≥7.9% to ≤12.1% of RTP*
2) P-13 input	~~N.A.~~	~~N.A.~~	~~N.A.~~	<10% RTP* Turbine Impulse Pressure Equivalent	<12.1% RTP* Turbine Impulse Pressure Equivalent
c. Power Range Neutron Flux, P-8	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤30% of RTP*	≤32.1% of RTP*
d. Power Range Neutron Flux, P-10	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤10% of RTP*	≥7.9% to ≤12.1% of RTP*
e. Turbine Impulse Chamber Pressure, P-13	~~N.A.~~	~~N.A.~~	~~N.A.~~	<10% RTP* Turbine Impulse Pressure Equivalent	<12.1% RTP* Turbine Impulse Pressure Equivalent
20. Reactor Trip Breakers	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
21. Automatic Trip and Interlock Logic	N.A.	N.A.	N.A.	N.A.	N.A.
22. Reactor Trip Bypass Breakers	N.A.	N.A.	N.A.	N.A.	N.A.

*RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

τ_6 = Time constant utilized in the measured T_{avg} lag compensator, $\tau_6 = 0$ s,

T' ≤ 588.4°F (Nominal T_{avg} at RATED THERMAL POWER),

K_3 = 0.00134,

P = Pressurizer pressure, psig,

P' = 2235 psig (Nominal RCS operating pressure),

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

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:

(i) for $q_t - q_b$ between ~~-[illegible]% and +10%, (Unit 1 Cycle 2 and Unit 2 Cycle 1), and~~ -32% and +13% ~~(Unit 1 Cycle 3 and after; Unit 2 Cycle 2 and after)~~ $f_1(\Delta I) = 0$, 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;

(ii) for each percent that the magnitude of $q_t - q_b$ exceeds ~~+10%, (Unit 1 Cycle 2 and Unit 2 Cycle 1), and~~ 13% ~~(Unit 1 Cycle 3 and after; Unit 2 Cycle 2 and after)~~, the ΔT Trip Setpoint shall be automatically reduced by ~~2.0% (Unit 1 Cycle 2 and Unit 2 Cycle 1), and~~ 1.74% ~~(Unit 1 Cycle 3 and after; Unit 2 Cycle 2 and after)~~ of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $q_t - q_b$ exceeds -32%, the ΔT trip setpoint shall be automatically reduced by 1.67% of its value at RATED THERMAL POWER ~~(Unit 1 Cycle 3 and after; Unit 2 Cycle 2 and after)~~

NOTE 2: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than ~~3.9%~~ of ΔT span.
3.71

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 3: (Continued)

K_6 = 0.00170/°F for T > T" and K_6 = 0 for T ≤ T",

T = As defined in Note 1,

T" = Indicated T_{avg} at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, ≤ 588.4°F),

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 ~~2.6%~~ 2.31 of ΔT span.

~~NOTE 5: The sensor error for temperature is 1.2 and for pressure is 1.0.~~

2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

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 assumed to 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 Allowable Value is acceptable since an allowance has been made in the safety analysis to accommodate this error. ~~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 + RE + SE ≤ 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. RE or Rack Error is the "as measured" deviation, in percent span, for the affected channel from the specified Trip Setpoint. SE or Sensor Error 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 is based upon combining all of the uncertainties in the channels. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensors 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 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.

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2* The Engineered Safety Features Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS Instrumentation or Interlock Trip 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 3.3-4 adjust the Setpoint consistent with the Trip Setpoint value.

b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~either:~~

~~1. Adjust the Setpoint consistent with the Trip Setpoint value of Table 3.3-4 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 3.3-3 until the channel is restored to OPERABLE status with its Setpoint adjusted consistent with the Trip Setpoint value.

~~Equation 2.2-1 $Z + RE + SE \leq TA$~~

~~Where:~~

~~Z = The value from Column Z of Table 3.3-4 for the affected channel,~~

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

~~SE = Either the "as measured" value (in percent span) of the sensor error, or the value for Column SE (Sensor Error) of Table 3.3-4 for the affected channel, and~~

~~TA = The value from Column TA (Total Allowance) of Table 3.3-4 for the affected channel.~~

c. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

~~*Control Room isolation not required prior to initial criticality on Cycle 1. Auxiliary Building Ventilation actuation not required prior to initial operation at ≥ 20% Rated Thermal Power (RTP) on Cycle 1.~~

TABLE 3.3-

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
1. Safety Injection (Reactor Trip, Feedwater Isolation, Start Diesel Generators, Containment Cooling Fans, Control Room Isolation, Phase "A" Isolation, Turbine Trip, Auxiliary Feedwater, Containment Vent Isolation and Essential Service Water)					
a. Manual Initiation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Containment Pressure-High-1	~~5.7~~	~~0.71~~	~~1.5~~	≤ 3.4 psig	≤ ~~5.0~~ 4.6 psig
d. Pressurizer Pressure-Low (Above P-11)	~~16.1~~	~~14.41~~	~~1.5~~	≥ 1829 psig	≥ ~~1823~~ 1813 psig
e. Steam Line Pressure-Low (Above P-11)	~~21.2~~	~~14.81~~	~~1.5~~	≥ 640 psig*	≥ ~~617~~ 614 psig*
2. Containment Spray					
a. Manual Initiation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Containment Pressure-High-3	~~8.0~~	~~0.71~~	~~1.5~~	< 20.0 psig	< ~~21.0~~ 21.2 psig

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
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. 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.
2) Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
3) Containment Pressure-High-3	~~8.0~~	~~0.71~~	~~1.5~~	≤ 20.0 psig	≤ ~~21.0~~ 21.2 psig
c. Containment Vent Isolation					
1) Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
2) Manual Phase "A" Isolation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
3) Manual Phase "B" Isolation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
4) Safety Injection	See Item 1 above for all Safety Injection Trip Setpoints and Allowable Values.				

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
4. Steam Line Isolation					
a. Manual Initiation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Containment Pressure-High-2	~~7.7~~	~~0.71~~	~~1.5~~	≤8.2 psig	≤~~9.2~~ 9.4 psig
d. Steam Line Pressure-Low (Above P-11)	~~21.2~~	~~14.81~~	~~1.5~~	≥640 psig*	≥~~617~~ 614 psig*
e. Steam Line Pressure Negative Rate-High (Below P-11)	~~8.0~~	~~0.5~~	~~0~~	≤100 psi**	≤~~111.5~~ 165.3 psi**
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Steam Generator Water Level-High-High (P-14)					
1) Unit 1	~~6.0~~	~~4.28~~	~~1.5~~	≤81.4% of narrow range instrument span	≤~~82.7%~~ 83.4 of narrow range instrument span
2) Unit 2	~~5.0 (Cycle 3) 18.9 (Cycle 4 and after)~~	~~2.18 (Cycle 3) 12.02 (Cycle 4 and after)~~	~~1.5 (Cycle 3) 3.2 (Cycle 4 and after)~~	≤78.1% (Cycle 3); ≤80.8% (Cycle 4 and after) of narrow range instrument span	≤~~79.9%~~ 79.7 (Cycle 3); ≤82.8% (Cycle 4 and after) of narrow range instrument span

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
5. Turbine Trip and Feedwater Isolation (continued)					
c. Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				
6. Auxiliary Feedwater					
a. Manual Initiation	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Steam Generator Water Level-Low-Low-Start Motor-Driven Pump and Diesel-Driven Pump					
1) Unit 1	~~N.A~~	~~N.A.~~	~~N.A.~~	≥33.0% of narrow range instrument span	≥31.0% of narrow range instrument span
2) Unit 2	~~17.0 (Cycle 3) N.A. (Cycle 4 and after)~~	~~14.78 (Cycle 3) N.A. (Cycle 4 and after)~~	~~1.5 (Cycle 3) N.A. (Cycle 4 and afte~~	≥17% (Cycle 3); ≥36.3% (Cycle 4 and after) of narrow range instrument span	≥~~15.3~~ 16.3% (Cycle 3); ≥~~35.4~~ 34.8% (Cycle 4 and after) of narrow range instrument span
d. Undervoltage-RCP Bus-Start Motor Driven Pump and Diesel-Driven Pump	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥5268 volts	≥~~4728~~ 4920 volts
e. Safety Injection-Start Motor-Driven Pump and Diesel-Driven Pump	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (SE)~~	TRIP SETPOINT	ALLOWABLE VALUE
6. Auxiliary Feedwater (Continued)					
f. Division 11 for Unit 1 (Division 21 for Unit 2) ESF Bus Undervoltage-Start Motor-Driven Pump	~~N.A.~~	~~N.A.~~	~~N.A.~~	2870 volts	2730 volts
g. Auxiliary Feedwater Pump Suction Pressure-Low (Transfer to Essential Service Water)	~~N.A.~~	~~N.A.~~	~~N.A.~~	1.22" Hg vac	2" Hg vac
7. Automatic Opening of Containment Sump Suction Isolation Valves					
a. Automatic Actuation Logic and Actuation Relays	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
b. RWST Level-Low-Low	~~N.A.~~	~~N.A.~~	~~N.A.~~	46.7%	44.7%
Coincident with Safety Injection	See Item 1. above for Safety Injection Trip Setpoints and Allowable Values.				

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	~~TOTAL ALLOWANCE (TA)~~	~~Z~~	~~SENSOR ERROR (S)~~	TRIP SETPOINT	ALLOWABLE VALUE
8. Loss of Power					
a. ESF Bus Undervoltage	~~N.A.~~	~~N.A.~~	~~N.A.~~	2870 volts w/1.8s delay	≥2730 volts w/≤1.9s delay
b. Grid Degraded Voltage	~~N.A.~~	~~N.A.~~	~~N.A.~~	3804 volts w/310s delay	≥3728 volts w/310 ± 30s delay
9. Engineered Safety Feature Actuation System Interlocks					
a. Pressurizer Pressure, P-11	~~N.A.~~	~~N.A.~~	~~N.A.~~	≤1930 psig	≤1936 psig
b. Reactor Trip, P-4	~~N.A.~~	~~N.A.~~	~~N.A.~~	N.A.	N.A.
c. Low-Low T_{avg}, P-12	~~N.A.~~	~~N.A.~~	~~N.A.~~	≥550°F	5472 ≥~~547.6~~°F
d. Steam Generator Water Level, P-14 (High-High)	See Item 5.b. above for all Steam Generator Water Level Trip Setpoints and Allowable Values.				

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, 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.

The Engineered Safety Features Actuation System Instrumentation Trip Setpoints specified in Table 3.3-4 are the nominal values at which the bistables are set for each functional unit. A 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 assumed to 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 3.3-4. 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. 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 3.3-1, $Z + RE + SE \leq TA$, 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 3.3-4, 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 the actuation. RE or Rack Error is the "as measured" deviation, in percent span, for the affected channel from the specified Trip Setpoint. SE or Sensor Error is either

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

~~the "as-measured" deviation of the sensor from its calibration point or the value specified in Table 3.3-4, in percent span, from the analysis assumptions. Use of Equation 3.3-1 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 is based upon combining all of the uncertainties in the channels. 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 statisitical 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 measurement of response time at the specified frequencies provides assurance that the Reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response times.

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 those Engineered Safety Features components whose aggregate function best serves the requirements of the condition. As an example, the following actions may be initiated by the Engineered Safety Features Actuation System to mitigate the consequences of a steam line break or loss of coolant accident: (1) Safety Injection pumps start and automatic valves position, (2) Reactor trip, (3) feedwater isolation, (4) startup of the emergency diesel generators, (5) containment spray pumps start and automatic valves position, (6) containment isolation, (7) steam line isolation, (8) Turbine trip, (9) auxiliary feedwater pumps start and automatic valves position, (10) containment cooling fans start and automatic valves position, and (11) essential service water pumps start and automatic valves position.

ATTACHMENT C

EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATIONS

CECo has evaluated this proposed amendment and determined that it involves no significant hazards considerations. According to 10 CFR 50.92(c), a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or
2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
3. Involve a significant reduction in a margin of safety.

The basis for this determination of no significant hazards considerations is presented below.

Unit(s): 1, 2

Applicable Mode(s): 1, 2, 3, 4

Other Relevant Plant Conditions: None

System(s) affected: EF, RP

Equipment Name(s): Allowable Values (AVs) for various Engineered Safety Features Actuation System (ESFAS) Instrumentation

AVs for various Reactor Trip System (RTS) Instrumentation

RTS Turbine Trip Emergency Trip Header Pressure Trip Setpoint

Describe the proposed change and the reason for the change.

As a result of the Setpoint Study, CECo is requesting changes in AVs for the RTS and ESFAS instrumentation listed in Table 1. NED calculations support the requested changes for RTS and ESFAS instrumentation AVs. The methodology used is the same that used by Westinghouse and documented in WCAP 12583, Westinghouse Setpoint Methodology for Protection Systems, May 1990. NED reviewed the assumptions of calibration tolerances and MTE and revised them to reflect those that will actually be used at the stations. No changes have been made that affect the ability of RTS or ESFAS instrumentation to perform their intended design functions.

CECo is requesting that the Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV be revised from ≥540 psig to ≥1000 psig and ≥520 psig to ≥815 psig, respectively. The requested changes to the Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV are conservative with respect to the current Technical Specification values. This change would result in a reactor trip sooner than the existing setpoint following a decrease in the main turbine emergency trip header pressure. The purpose of the reactor trip on turbine trip above 30% power (P-8) due to decreasing electro-hydraulic fluid in the emergency trip header is for equipment protection and is anticipatory in nature. This reactor trip is not taken credit for in any accident analyses.

CECo is requesting that the TA, Z, and SE values currently in Technical Specification Tables 2.2-1 and 3.3-4 be deleted from those tables. As a result of this proposed change, Equation 2.2-1 would also be deleted from Technical Specifications 2.2.1 and 3.3.2, the corresponding action statements would be changed to reflect the deletion of Equation 2.2-1, and the corresponding Technical Specification Bases would also be changed to reflect the deletion of Equation 2.2-1. The requested change to delete the TA, Z, and SE values from Technical Specification Tables 2.2-1 and 3.3-4 will not affect plant operation and is conservative with respect to determining channel operability. The TA, Z, and SE values are only used to evalute the operability of an instrument channel that has been determined to be in excess of the AV. The instrument channel would still be operable if Technical Specification Equation 2.2-1 was satisfied:

$Z + RE + SE \leq TA$ where RE is the "as measured" value of Rack Error for the affected channel

The TA, Z, and SE values are only applicable if there is excess margin between the associated channel's AV and the safety analysis limit. If excess margin is not available, then the values of TA, Z, and SE are listed as N.A. (Not Applicable) in Technical Specification Tables 2.2-1 and 3.3-4. The Setpoint Study would require revision to the TA, Z, and SE value for 12 of the 22 RTS Functional Units and 7 of the 9 ESFAS Functional Units. As a result, approximately three fourths of the TA, Z, and SE values listed in Technical Specification Tables 2.2-1 and 3.3-4 would be N.A. since the study used varying amounts of excess margin to maintain the safety analyses setpoints at their current values. As a practical matter, Equation 2.2-1 is not used to determine operability because the channel is declared inoperable and the appropriate action statements are followed during surveillance testing and the channel must be restored to within its associated AV prior to returning the channel to service.

CECo is requesting that the cycle specific requirements contained on page 2-8, Note 1, Parts (i), (ii), and (iii) be deleted since they are no longer applicable.

CECo is requesting that the cycle specific relief for BRNPS Technical Specification 3.3.2 be deleted since it is no longer applicable.

List the applicable Safety Analysis Report (SAR) sections which describe the affected systems, structures, or components (SSCs) or activities. Also list the SAR accident analysis sections which discuss the affected SSCs or their operation. List any other controlling documents such as Safety Evaluation Reports (SERs), Title 10 Code of Federal Regulations (10CFR), Regulatory Guides, previous modifications or Safety Evaluations, etc...

SAR Chapter 7 Sections 2 and 3
SAR Chapter 15

Describe how the change will affect plant operation when changed SSCs function as intended (i.e., focus on system operation/interactions in the absence of equipment failures). Consider all applicable operating modes. Include a discussion of any changed interactions with other SSC's. Review the following areas for interactions: Mechanical, Electrical, I&C, Structural, Fire Protection, Environmental Qualifications, Site/Environmental Impacts, Radiological Concerns, Security Concerns and Flooding, and discuss adverse affects.

The proposed changes to the AVs for RTS and ESFAS Instrumentation will continue to ensure that the associated RTS or ESFAS actuation signals will be generated when required within the bounds of the plant's safety analyses.

The proposed changes to the RTS Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV will generate a reactor trip signal quicker than the current Technical Specification values due to the conservative nature of the change.

The proposed removal of the TA, Z, and SE values from the Technical Specifications will have no effect on plant operations.

The proposed removal of cycle specific relief no longer applicable from the Technical Specifications will have no effect on plant operations.

Describe how the change will affect reactivity management.

Some of the proposed changes to the AVs for RTS and ESFAS instrumentation are in the conservative direction with respect to the current Technical Specification value. This will cause the associated RTS or ESFAS actuation to occur sooner when the monitored parameter exceeds its AV. This will have an overall positive affect on reactivity management.

The proposed change to the Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV will initiate a reactor trip sooner than the currently allowed Technical Specification values thus providing a positive affect on reactivity management.

Many of the proposed changes to the AVs for RTS and ESFAS instrumentation are in the nonconservative direction with respect to the current Technical Specification value. This will cause a delay in the associated RTS or ESFAS actuation when the monitored parameter exceeds its AV. This will have an overall negative affect on reactivity management. However, all of these changes in the nonconservative direction are bounded by the plant's safety analyses and therefore, the negative affect on reactivity management is acceptable.

The proposed removal of the TA, Z, and SE values from the Technical Specifications will have no effect on reactivity management.

The proposed removal of cycle specific relief no longer applicable from the Technical Specifications will have no effect on reactivity management.

Describe how the change will affect equipment failures. In particular, describe any new failure modes and their impact during all applicable Operating modes.

The proposed changes to the AVs for RTS and ESFAS instrumentation will only affect the setpoint at which a piece of equipment is actuated. No physical equipment changes are being made, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

The proposed changes to the RTS Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV will will affect the setpoint at which a reactor trip signal is generated as a result of decreasing pressure in the main turbine emergency trip header. No physical equipment changes are being made, and therefore no new equipment failure modes are being introduced as a result of these proposed changes.

The proposed removal of the TA, Z, and SE values from the Technical Specifications will have no effect on plant equipment, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

The proposed removal of cycle specific relief no longer applicable from the Technical Specifications will have no effect on plant equipment, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

Identify each accident or anticipated transient (i.e., large/small break LOCA, loss of load) described in the SAR where any of the following is true:

The change alters the initial conditions used in the SAR analysis

The changed SSC is explicitly or implicitly assumed to function during or after the accident

Operation or failure of the changed SSC could lead to the accident

Other

ACCIDENT: High-High D-4 SG Water Level Turbine Trip and Feedwater Isolation Actuation

SAR SECTION: 15.1.2

ACCIDENT: Loss of Reactor Coolant System (RCS) Flow Reactor Trip

SAR SECTION: 15.3.1

List each Technical Specification (Safety Limit, Limiting Safety System Setting or Limiting Condition for Operation) where the requirement, associated action items, associated surveillances, or bases may be affected.

TECHNICAL SPECIFICATION SECTION(S):

2.2.1
Table 2.2-1
3.3.2
Table 3.3-4

To determine if the probability or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR may be increased, answer the following questions for each accident listed. Provide the rationale for all NO answers. Answer separately for each accident that is affected in a different manner.

Affected Accident: High-High D-4 SG Water Level Turbine Trip and Feedwater Isolation Actuation

SAR Section: 15.1.2

May the probability of the accident be increased?

The probability of this accident occurring will not increase. Sufficent redundancy of equipment exists to ensure that the appropriate actuation signals are generated when the monitored parameters exceed their associated trip setpoints.

May the consequences of an accident (offsite dose) be increased?

The consequences of this accident will not be increased. The increase in the AV for the D-4 SG High-High Water Level Turbine Trip and Feedwater Isolation Actuation will delay the generation of those actuation signals approximately 2.5 seconds from the time they would have occurred using the current Technical Specification AV. Increasing the Safety Analysis Limit (SAL) to accommodate the proposed AV will have no appreciable effect on the Departure from Nucleate Boiling Ratio (DNBR) since it is effectively constant at the time of signal actuation and remains well above the Departure from Nucleate Boiling (DNB) limit throughout the entire transient.

May the probability of a malfunction of equipment important to safety increase?

The probability of a malfuntion of equipment important to safety will not increase. There will be no change in plant equipment as a result of these proposed changes. Sufficent redundancy of equipment currently exists to ensure that the appropriate actuation signals are generated when the monitored parameters exceed their associated trip setpoints.

May the consequences of a malfunction of equipment important to safety increase?

The consequences of a malfuntion of equipment important to safety will not increase. There will be no change in plant equipment as a result of these proposed changes. Sufficent redundancy of equipment currently exists to ensure that the appropriate actuation signals are generated when the monitored parameters exceed their associated trip setpoints.

Affected Accident: Loss of RCS Flow Reactor Trip

SAR Section: 15.3.1

May the probability of the accident be increased?

The probability of this accident occurring will not increase. Sufficent redundancy of equipment exists to ensure that the appropriate actuation signals are generated when the monitored parameters exceed their associated trip setpoints.

May the consequences of an accident (offsite dose) be increased?

The consequences of this accident will not be increased. The decrease in the AV for RCS Flow Low can be accounted for by decreasing the SAL without affecting the outcome of the safety analysis. For the Locked Rotor/Shaft Break event, there will be no change in the time in which a reactor trip is initiated since the reduction in RCS flow is so rapid. For the Partial Loss of Forced Flow event, the change in the SAL will result in a delay of the initiation of the reactor trip signal by less than 0.1 second. This change will not significantly affect the DNBR transient.

May the probability of a malfunction of equipment important to safety increase?

The probability of a malfuntion of equipment important to safety will not increase. There will be no change in plant equipment as a result of these proposed changes. Sufficent redundancy of equipment currently exists to ensure that the appropriate actuation signals are generated when the monitored parameters exceed their associated trip setpoints.

May the consequences of a malfunction of equipment important to safety increase?

The consequences of a malfuntion of equipment important to safety will not increase. There will be no change in plant equipment as a result of these proposed changes. Sufficent redundancy of equipment currently exists to ensure that the appropriate actuation signals are generated when the monitored parameters exceed their associated trip setpoints.

Based on the answers above, does the change adversely impact systems or functions so as to create the possibility of an accident or malfunction of a type different from those in the SAR? Describe the rationale for this answer.

The possibility of a new or different type of accident will not be created as a result of these proposed changes. Except for the two types of accidents previously discussed, these proposed changes were already bounded by the existing safety analyses. For the two accidents previously discussed, the corresponding SALs were changed to bound the proposed changes without affecting the outcomes of the corresponding safety analyses.

Determine if parameters used to establish the Technical Specification requirements are changed. If no Technical Specifications are impacted, then no reduction in margin of safety exists in the context of this question.

There is no reduction in the margin of safety from these proposed changes. Except for the two types of accidents previously discussed, these proposed changes were already bounded by the existing safety analyses. For the two accidents previously discussed, the corresponding SALs were changed to bound the proposed changes without affecting the outcomes of the corresponding safety analyses.

SUMMARY OF THE SIGNIFICANT HAZARDS CONSIDERATIONS

Commonwealth Edison Company (CECo) has evaluated this proposed amendment and determined that it involves no significant hazards considerations. According to 10 CFR 50.92(c), a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3. Involve a significant reduction in a margin of safety.

The basis for this determination of no significant hazards considerations is presented below:

CECo is requesting numerous changes in the Allowable Values (AVs) for the Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) instrumentation listed in Technical Specification Tables 2.2-1 and 3.3-4. CECo Nuclear Engineering Department (NED) calculations support the requested changes for RTS and ESFAS instrumentation AVs. The methodology used is the same that used by Westinghouse and documented in WCAP 12583, Westinghouse Setpoint Methodology for Protection Systems, May 1990. NED reviewed the assumptions of calibration tolerances and measurement and test equipment (MTE) and revised them to reflect those that will actually be used at the stations.

CECo is requesting that the Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV be revised from ≥540 psig to ≥1000 psig and ≥520 psig to ≥815 psig, respectively. The requested changes to the Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV are conservative with respect to the current Technical Specification values. This change would result in a reactor trip sooner than the existing setpoint following a decrease in the main turbine emergency trip header pressure. The purpose of the reactor trip on turbine trip above 30% power (P-8) due to decreasing electro-hydraulic fluid in the emergency trip header is for equipment protection and is anticipatory in nature. This reactor trip is not taken credit for in any accident analyses.

CECo is requesting that the Total Allowance (TA), Z, and Sensor Error (SE) values currently in Technical Specification Tables 2.2-1 and 3.3-4 be deleted from those tables. As a result of this proposed change, Equation 2.2-1 would also be deleted from Technical Specifications 2.2.1 and 3.3.2, the corresponding action statements would be changed to reflect the deletion of Equation 2.2-1, and the corresponding Technical Specification Bases would also be changed to reflect the deletion of Equation 2.2-1. The requested change to delete the TA, Z, and SE values from Technical Specification Tables 2.2-1 and 3.3-4 will not affect plant operation and is conservative with respect to determining channel operability. The TA, Z, and SE values are only used to evalute the operability of an instrument channel that has been determined to be in excess of the AV. The instrument channel would still be operable if Technical Specification Equation 2.2-1 was satisfied:

$Z + RE + SE \leq TA$ where RE is the "as measured" value of Rack Error for the affected channel

The TA, Z, and SE values are only applicable if there is excess margin between the associated channel's AV and the safety analysis limit. If excess margin is not available, then the values of TA, Z, and SE are listed as N.A. (Not Applicable) in Technical Specification Tables 2.2-1 and 3.3-4. The Setpoint Study would require revision to the TA, Z, and SE value for 12 of the 22 RTS Functional Units and 7 of the 9 ESFAS Functional Units. As a result, approximately three fourths of the TA, Z, and SE values listed in Technical Specification Tables 2.2-1 and 3.3-4 would be N.A. since the study used varying amounts of excess margin to maintain the safety analyses setpoints at their current values. As a practical matter, Equation 2.2-1 is not used to determine operability because the channel is declared inoperable and the appropriate action statements are followed during surveillance testing and the channel must be restored to within its associated AV prior to returning the channel to service.

CECo is requesting that the cycle specific requirements contained on page 2-8, Note 1, Parts (i), (ii), and (iii) be deleted since they are no longer applicable.

CECo is requesting that the cycle specific relief for BRNPS Technical Specification 3.3.2 be deleted since it is no longer applicable.

The proposed changes to the AVs for RTS and ESFAS Instrumentation will continue to ensure that the associated RTS or ESFAS actuation signals will be generated when required within the bounds of the plant's safety analyses.

The proposed changes to the RTS Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV will generate a reactor trip signal quicker than the current Technical Specification values due to the conservative nature of the change.

The proposed removal of the TA, Z, and SE values from the Technical Specifications will have no effect on plant operations.

The proposed removal of cycle specific relief no longer applicable from the Technical Specifications will have no effect on plant operations.

Some of the proposed changes to the AVs for RTS and ESFAS instrumentation are in the conservative direction with respect to the current Technical Specification value. This will cause the associated RTS or ESFAS actuation to occur sooner when the monitored parameter exceeds its AV. This will have an overall positive affect on reactivity management.

Many of the proposed changes to the AVs for RTS and ESFAS instrumentation are in the nonconservative direction with respect to the current Technical Specification value. This will cause a delay in the associated RTS or ESFAS actuation when the monitored parameter exceeds its AV. This will have an overall negative affect on reactivity management. However, all but two of the proposed changes were already bounded by the existing safety analyses. For those two proposed changes that were not, the Safety Analysis Limit (SAL) for the corresponding accidents were changed to bound the proposed changes without affecting the outcomes of the accident analyses. Therefore, the negative affect on reactivity management is acceptable.

The proposed change to the Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV will initiate a reactor trip sooner than the currently allowed Technical Specification values thus providing a positive affect on reactivity management.

The proposed removal of the TA, Z, and SE values from the Technical Specifications will have no effect on reactivity management.

The proposed removal of cycle specific relief no longer applicable from the Technical Specifications will have no effect on reactivity management.

The proposed changes to the AVs for RTS and ESFAS instrumentation will only affect the setpoint at which a piece of equipment is actuated. No physical equipment changes are being made, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

The proposed changes to the RTS Turbine Trip Emergency Trip Header Pressure Trip Setpoint and AV will will affect the setpoint at which a reactor trip signal is generated as a result of decreasing pressure in the main turbine emergency trip header. No physical equipment changes are being made, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

The proposed removal of the TA, Z, and SE values from the Technical Specifications will have no effect on plant equipment, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

The proposed removal of cycle specific relief no longer applicable from the Technical Specifications will have no effect on plant equipment, and therefore, no new equipment failure modes are being introduced as a result of these proposed changes.

The possibility of a new or different type of accident will not be created as a result of these proposed changes. Except for the two types of accidents previously discussed, these proposed changes were already bounded by the existing safety analyses. For the two accidents previously discussed, the corresponding SALs were changed to bound the proposed changes without affecting the outcomes of the corresponding safety analyses.

There is no reduction in the margin of safety from these proposed changes. Except for the two types of accidents previously discussed, these proposed changes were already bounded by the existing safety analyses. For the two accidents previously discussed, the corresponding SALs were changed to bound the proposed changes without affecting the outcomes of the corresponding safety analyses.

ATTACHMENT D

ENVIRONMENTAL ASSESSMENT

Commonwealth Edison has evaluated the proposed amendment against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10CFR51.21. It has been determined that the proposed change meets the criteria for a categorical exclusion as provided for under 10CFR51.22(c) (9).

The proposed change involves revisions to RTS and ESF Allowable Values and one ESFAS trip setpoint. No setpoints for containment isolation or other systems that could impact radiation releases are affected. All accident assumptions are preserved, or have been successfully re-evaluated. Also, none of the proposed changes involve irreversible consequences.

The proposed change does not involve a significant hazards consideration as discussed in Attachment C to this letter. Also, this proposed amendment will not involve significant changes in the types or amounts of any radioactive effluents nor does it affect any of the permitted release paths. In addition, this change does not involve a significant increase in individual or cumulative occupational exposure. Therefore, this change meets the categorical exclusion permitted by 10CFR51.22(c)(9).

ATTACHMENT E

Revised Values for TA, Z and SE

The following RTS and ESFAS Instrumentation values for TA, Z and SE were calculated as part of the Setpoint Study. The calculated values are included here for information only. "(N.A.)" is listed after the values for cases where the TA, Z and SE for this instrumentation cannot meet the Equation 2.2-1 if the setpoint is found outside the Allowable Value. This information will be maintained in CECo administrative programs and maintained through the 50.59 process.

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
1. Manual Reactor Trip	N.A	N.A.	N.A.
2. Power Range, Neutron Flux			
a. High Setpoint	7.5	4.56	0
b. Low Setpoint	8.33	4.56	0
3. Power Range, Neutron Flux, High Positive Rate	1.58	0.5	0
4. Power Range, Neutron Flux, High Negative Rate	1.58	0.5	0
5. Intermediate Range, Neutron Flux	17.0	8.41	0
6. Source Range, Neutron Flux	17.0	10.01	0
7. Overtemperature ΔT	9.65 (N.A.)	5.26 (N.A.)	(P)1.79(N.A.) (T)1.33(N.A.)
8. Overpower ΔT	4.75 (N.A.)	1.54 (N.A.)	1.88(N.A.)
9. Pressurizer Pressure-Low	5.0 (N.A.)	1.0 (N.A.)	2.5 (N.A.)
10. Pressurizer Pressure-High	6.9 (N.A.)	5.0 (N.A.)	1.5 (N.A.)
11. Pressurizer Water Level-High	5.0 (N.A.)	2.18 (N.A.)	2.75(N.A.)
12. Reactor Coolant Flow-Low	4.45 (N.A.)	3.6 (N.A.)	1.1 (N.A.)
13. Steam Generator Water Level Low-Low			
a. Unit 1	19.3 (N.A.)	15.1 (N.A.)	2.5 (N.A.)
b Unit 2	17.7 (N.A.)	15.08 (N.A.)	2.51(N.A.)
14. Undervoltage - Reactor Coolant Pumps	8.35	0.27	0
15. Underfrequency - Reactor Coolant Pumps	44.4	13.3	0

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
16. Turbine Trip			
a. Emergency Trip Header Pressure	N.A.	N.A	N.A.
b. Turbine Throttle Valve Closure	N.A.	N.A.	N.A.
17. Safety Injection Input from ESF	N.A.	N.A.	N.A.
18. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.	N.A.
19. Reactor Trip System Interlocks			
a. Intermediate Range Neutron Flux, P-6	N.A.	N.A.	N.A.
b. Low Power Reactor Trips Block, P-7			
1) P-10 input	N.A.	N.A.	N.A.
2) P-13 input	N.A.	N.A.	N.A.
c. Power Range Neutron Flux, P-8	N.A.	N.A.	N.A.
d. Power Range Neutron Flux, P-10	N.A.	N.A.	N.A.
e. Turbine Impulse Chamber Pressure, P-13	N.A.	N.A.	N .
20. Reactor Trip Breakers	N.A.	N.A.	N.A.
21. Automatic Trip and Interlocks Logic	N.A.	N.A.	N.A.
22. Reactor Trip Bypass Breakers	N.A.	N.A.	N.A.

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ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
1. Safety Injection (Reactor Trip, Feedwater Isolation, Start Diesel Generators, Containment Cooling Fans, Control Room Isolation, Phase"A" Isolation, Turbine Trip, Auxiliary Feedwater, Containment Vent Isolation and Essential Service Water)			
a. Manual Initiation	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
c. Containment Pressure-High-1	5.7	0.71	2.55
d. Pressurizer Pressure-Low (Above P-11)	16.1 (N.A.)	11.01 (N.A.)	2.5 (N.A.)
e. Steam Line Pressure-Low (Above P-11)	21.23	11.01	2.57
2. Containment Spray			
a. Manual Initiation	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
c. Containment Pressure-High-3	8.0	0.71	2.55

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
3. Containment Isolation			
a. Phase "A" Isolation			
1) Manual Initiation	N.A.	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
3) Safety Injection	See Item 1.		
b. Phase "B" Isolation			
1) Manual Initiation	N.A.	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
3) Containment Pressure-High-3	8.0	0.71	2.55
c. Containment Vent Isolation			
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
2) Manual Phase "A" Isolation	N.A.	N.A.	N.A.
3) Manual Phase "B" Isolation	N.A.	N.A.	N.A.
4) Safety Injection	See Item 1		

ENGINEERED SAFETY FEATURES ACTUATION YSTEM INSTRUMENTATION
TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
4. Steam Line Isolation			
a. Manual Initiation	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
c. Containment Pressure-High-2	7.7	0.71	2.55
d. Steam Line Pressure-Low (Above P-11)	21.23	11.01	2.57
e. Steam Line Pressure Negative Rate-High (Below P-11)	5.92	0.5	0
5. Turbine Trip and Feedwater Isolation			
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
b. Steam Generator Water Level-High-High (P-14)			
1) Unit 1	18.6	4.8	2.5
2) Unit 2	18.9	12.02	2.51
c. Safety Injection	See Item 1		

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
6. Auxiliary Feedwater			
a. Manual Initiation	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
c. Steam Generator Water Level-Low-Low-Start Motor-Driven Pump and Diesel-Driven Pump			
1) Unit 1	19.3 (N.A.)	1.51 (N.A.)	2.5 (N.A.)
2) Unit 2	17.7 (N.A.)	15.08 (N.A.)	2.51(N.A.)
d. Undervoltage-RCP Bus-Start Motor Driven Pump and Diesel-Driven Pump	N.A.	N.A.	N.A.
e. Safety Injection-Start Motor-Driven Pump and Diesel Driven Pump	See Item 1.		
f. Division 11 for Unit 1 (Division 21 for Unit 2) ESF Bus undervoltage - Start Motor-Driven Pump	N.A.	N.A.	N.A.
g. Auxiliary Feedwater Pump Suction Pressure-Low (Transfer to Essential Service Water)	N.A.	N.A.	N.A.
7. Automatic Opening of Containment Sump Suction Isolation Valves			
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.
b. RWST Level-Low-Low Coincident with Safety Injection			

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (SE)
8. Loss of Power			
a. ESF Bus Undervoltage	N.A.	N.A.	N.A.
b. Grid Degraded Voltage	N.A.	N.A.	N.A.
9. Engineered Safety Feature Actuation System Interlocks			
a. Pressurizer Pressure, P-11	N.A.	N.A.	N.A.
b. Reactor Trip, P-4	N.A.	N.A.	N.A.
c. Low-Low T_{avg}, P-12	N.A.	N.A.	N.A.
d. Steam Generator Water Level, P-14 (High-High)	See Item 5.b		