

ATTACHMENT 3

**PROPOSED TECHNICAL SPECIFICATIONS**

**Marked up Technical Specification Pages**

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TABLE 3.3-2 (Continued)  
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

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

(Insert)

TABLE 3.3-2 (Continued)  
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
6. Auxiliary Feedwater### (Continued)					
b. Stm. Gen. Water Level-- Low-Low	3/steam generator	2/steam generator in any steam generator	2/steam generator	1, 2, 3	15
c. Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
d. Bus Stripping	1/bus	1/bus	1/bus	1, 2, 3	23
e. Trip of All Main Feed- water Pumps Breakers	1/breaker	(1/breaker) /operating pump	(1/breaker) /operating pump	1, 2	23
7. Loss of Power					
a. 4.16 kV Busses A and B (Loss of Voltage)	2/bus	2/bus	2/bus	1, 2, 3, 4	18
b. 480 V Load Centers 3A, 3B, 3C, 3D and 4A, 4B, 4C, 4D Degraded Voltage	2 per load center	2 on any load center	2 per load center	1, 2, 3, 4	18
Coincident with: Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements				

TABLE 3.3-2 (Continued)

TABLE NOTATION

#Trip function may be blocked in this MODE below the Pressurizer Pressure Interlock Setpoint of 2000 psig.

##Channels are for particulate radioactivity and for gaseous radioactivity.

###Auxiliary feedwater manual initiation is included in Specification 3.7.1.2.

\*Trip function may be blocked in this MODE below the  $T_{avg}$ --Low Interlock Setpoint.

\*\*Only during CORE ALTERATIONS or movement of irradiated fuel within the containment.

ACTION STATEMENTS

- ACTION 14 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1, provided the other channel is OPERABLE.
- ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.
- ACTION 16 - With less than the Minimum Channels OPERABLE requirement, comply with the ACTION statement requirements of Specification 3.3.3:1 Item 1a of Table 3.3-4.
- ACTION 17 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### Steam Generator overfill protection is not part of the Engineered Safety Features Actuation System (ESFAS), and is added to the Technical Specifications only in accordance with NRC Generic Letter 89-19.

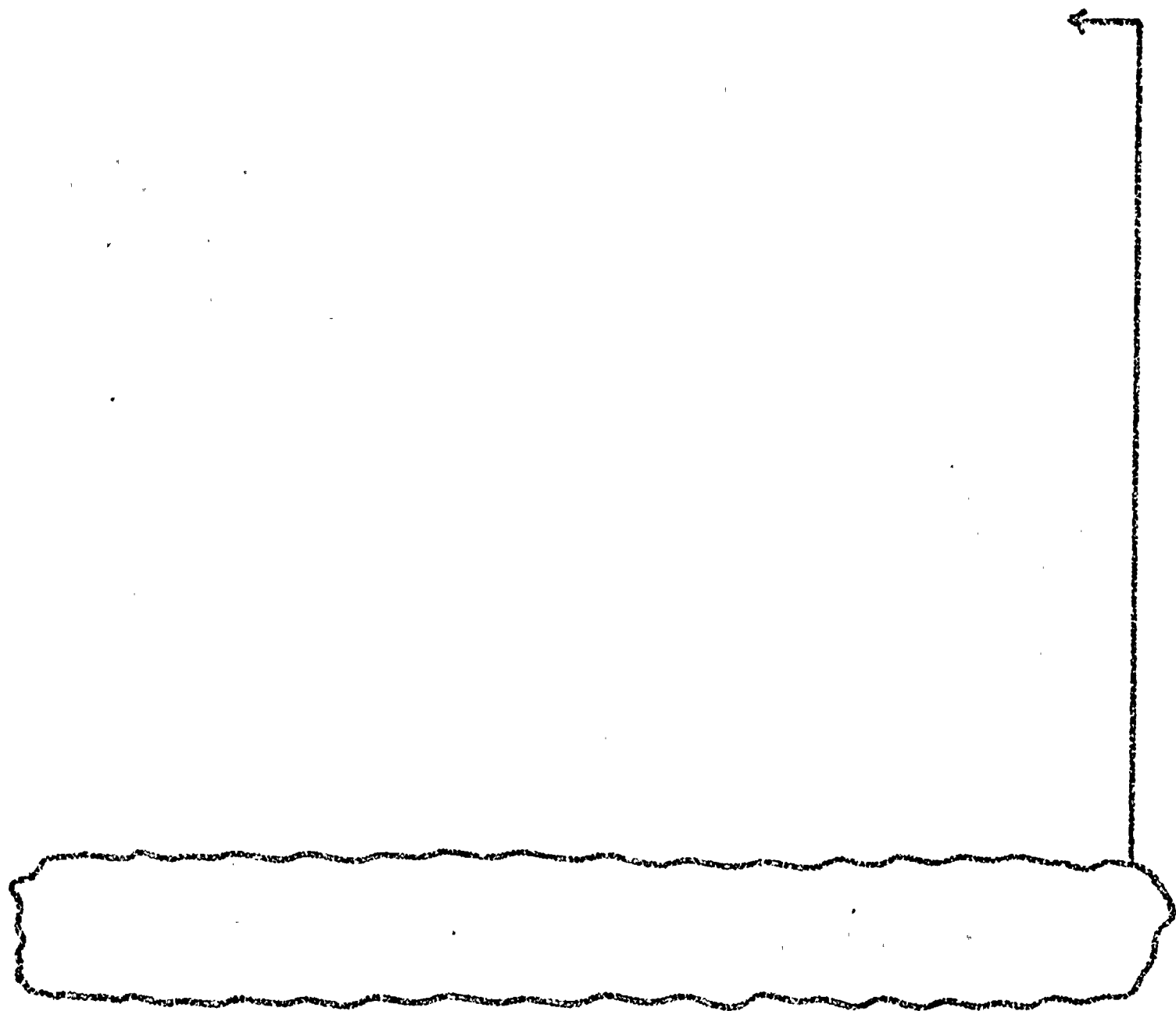


TABLE 3.3-3 (Continued)

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	21.3	2.7	0.0	≤20.0 psig	≤22.6 psig
High Coincident with: Containment Pressure--High	13.3	10.3	0.0	≤4.0 psig	≤4.5 psig
d. Steam Line Flow--High	16.7	2.86	3.9	<A function defined as follows: A Δp corresponding to 40% steam flow at 0% load increasing linearly from 20% load to a value corresponding to 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	≥614 psig	≥588 psig
or T <sub>avg</sub> --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.	
c. Stm. Gen. Water Level High- High	20.0	18.27	2.0	≤80% of narrow range instrument span	≤81.9% of narrow range instrument span

TURKEY POINT - UNITS 3 &amp; 4

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AMENDMENT NOS. 149 AND 144

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>ALLOWANCE (TA)</u>	<u>Z</u>	<u>S</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE#</u>
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% 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 Trip 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.

TURKEY POINT - UNITS 3

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AMENDMENT NOS. 146 AND 141



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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION  
SURVEILLANCE REQUIREMENTS

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

TURKEY POINT - UNITS 3 &amp; 4

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AMENDMENT NOS. 140 AND 135

### 3/4.3 INSTRUMENTATION

#### BASES

#### 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"

## INSTRUMENTATION

### BASES

#### 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



## INSTRUMENTATION

### BASES

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

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) feed water isolation, (4) startup of the emergency diesel generators, (5) containment spray pumps start and automatic valves position (6) containment ventilation 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, (11) intake cooling water and component cooling water pumps start and automatic valves position, and (12) Control Room Isolation and Ventilation Systems start.

(INSERT)

The Engineered Safety Features Actuation System interlocks perform the following functions:

**HIGH STEAM FLOW SAFETY INJECTION BLOCK** - This permissive is used to block the safety injection (SI) signal generated by High Steam Line Flow coincident with Low Steam Line Pressure or Low  $T_{avg}$ . The permissive is generated when two out of three Low  $T_{avg}$  channels drop below their setpoints and the manual SI Block/Unblock switch is momentarily placed in the block position. This switch is a spring return to the normal position type. The permissive will automatically be defeated if two out of three Low  $T_{avg}$  channels rise above their setpoints. The permissive may be manually defeated when two out of three Low  $T_{avg}$  channels are below their setpoints and the manual SI Block/Unblock switch is momentarily placed in the unblock position.

**LOW PRESSURIZER PRESSURE SAFETY INJECTION BLOCK** - This permissive is used to block the safety injection signals generated by Low Pressurizer Pressure and High Differential Pressure between the Steam Line Header and any Steam Line. The permissive is generated when two out of three pressurizer pressure permissive channels drop below their setpoints and the manual SI Block/Unblock switch is momentarily placed in the block position. This is the same switch that is used to manually block the High Steam Flow Safety Injection signals mentioned above. This permissive will automatically be defeated if two out of three pressurizer pressure permissive channels rise above their setpoints. The permissive may be manually defeated when two out of three pressurizer pressure permissive channels are below their setpoints and the manual SI Block/Unblock switch momentarily placed in the Unblock position.

This system also provides a feedwater system isolation to prevent SG overfill. Steam Generator overfill protection is not part of the Engineered Safety Features Actuation System (ESFAS), and is added to the Technical Specifications only in accordance with NRC Generic Letter 89-19.

