TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINTS	ALLOWABLE VALUES
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water Level -- High-High	$\leq$ 67% of narrow range instrument span each steam generator	$\leq$ 68% of narrow range instrument span each steam generator
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	Not Applicable	Not Applicable
7. UNDERVOLTAGE, VITAL BUS		
a. Loss of Voltage	$\geq$ 70% of bus voltage	$\geq$ 65% of bus voltage
b. Sustained Degraded Voltage	$\geq$ 91.6% of bus voltage for $\leq$ 13 seconds	$\geq$ 91% of bus voltage for $\leq$ 15 seconds
8. AUXILIARY FEEDWATER		
a. Automatic Actuation Logic	Not Applicable	Not Applicable
b. Manual Initiation	Not Applicable	Not Applicable
c. Steam Generator Water Level-- Low-Low	$\geq$ 8.5% of narrow range instrument span each steam generator	$\geq$ 7.5% of narrow range instrument span each steam generator
d. Undervoltage - RCP	$\geq$ 70% RCP bus voltage	$\geq$ 65% RCP bus voltage
e. S.I.	See 1 above (All S.I. setpoints)	
f. Emergency Trip of Steam Generator Feedwater Pumps	Not Applicable	Not Applicable
g. Station Blackout	See 6 and 7 above (SEC and Undervoltage, Vital Bus)	

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINTS	ALLOWABLE VALUES
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water Level -- High-High	$\leq$ 67% of narrow range instrument span each steam generator	$\leq$ 68% of narrow range instrument span each steam generator
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	Not Applicable	Not Applicable
7. UNDERVOLTAGE, VITAL BUS		
a. Loss of Voltage	$\geq$ 70% of bus voltage	$\geq$ 65% of bus voltage
b. Sustained Degraded Voltage	$\geq$ 91.6% of bus voltage for $\leq$ 13 seconds	$\geq$ 91% of bus voltage for $\leq$ 15 seconds
8. AUXILIARY FEEDWATER		
a. Automatic Actuation Logic	Not Applicable	Not Applicable
b. Manual Initiation	Not Applicable	Not Applicable
c. Steam Generator Water Level-- Low-Low	$\geq$ 8.5% of narrow range instrument span each steam generator	$\geq$ 7.5% of narrow range instrument span each steam generator
d. Undervoltage - RCP	$\geq$ 70% RCP bus voltage	$\geq$ 65% RCP bus voltage
e. S.I.	See 1 above (All S.I. setpoints)	
f. Trip of Main Feedwater Pumps	Not Applicable	Not Applicable

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
Three Loops	1 T_{avg}/operating loop	1### T_{avg} in any operating loop	1 T_{avg} in any two operating loops		15
OR, COINCIDENT WITH					
Steam Line Pressure-Low				1, 2, 3###	
Four Loops Operating	1 pressure/ loop	1 pressure any 2 loops	1 pressure any 3 loops		14*
Three Loops Operating	1 pressure/ operating loop	1### pressure in any operating loop	1 pressure in any 2 operating loops		15
5. TURBINE TRIP & FEEDWATER ISOLATION					
a. Steam Generator Water level-- High-High	3/loop	2/loop in any operating loop	2/loop in each operating loop	1, 2, 3	14*
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	3	2	3	1, 2, 3, 4	13
7. UNDERVOLTAGE, VITAL BUS					
a. Loss of Voltage	1/bus	2	3	1, 2, 3	14*
b. Sustained Degraded Voltage	3/bus	2/bus	3/bus	1, 2, 3	14*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
Three Loops	1 T_{avg}/operating loop	1### T_{avg} in any operating loop	1 T_{avg} in any two operating loops		15
OR, COINCIDENT WITH					
Steam Line Pressure-Low				1, 2, 3##	
Four Loops Operating	1 pressure/loop	1 pressure any 2 loops	1 pressure any 3 loops		14*
Three Loops Operating	1 pressure/operating loop	1### pressure in any operating loop	1 pressure in any 2 operating loops		15
5. TURBINE TRIP & FEEDWATER ISOLATION					
a. Steam Generator Water level--High-High	3/loop	2/loop in any operating loop	2/loop in each operating loop	1, 2, 3	14*
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	3	2	3	1, 2, 3, 4	13
7. UNDERVOLTAGE, VITAL BUS					
a. Loss of Voltage	1/bus	2	3	1, 2, 3	14*
b. Sustained Degraded Voltage	3/bus	2/bus	3/bus	1, 2, 3	14*

ATTACHMENT 3

FAILURE MODE ANALYSIS

Failure	Normal Operation With Degraded Grid	LOCA & Degraded Grid
Undervoltage Relay	2 out of 3 logic will be made to load bus to diesel generator. Acceptable	2 out of 3 logic will be made to load bus to diesel generator. Acceptable
Timing Relay Failure	Same as above	Same as above
Undervoltage Auxiliary Relay Failure	Same as above	Same as above
HFA Relay Failure	Same as above	Same as above
Loss of 125 Volt Battery	Bus with failed battery system would maintain connection to grid. Buses without failed battery would load to diesel. Same as present design. Previously Analyzed	Bus with failed battery system would maintain connection to grid. Buses without failed battery would load to diesel. Same as present design. Previously Analyzed
Loss of 125 Volt DC Branch CKT	Same as above	Same as above
Loss of Cable from Bus to S.E.C.	Bus with failed cable would maintain connected to grid. Other buses would load to diesel. Two vital buses would be available for safe shutdown. Therefore previously analyzed.	Bus with failed cable would maintain connected to grid. Other buses would load to diesel. Two vital buses would be available for safe shutdown. Therefore previously analyzed.
62X Defeat Relay	Alarm in control room. Bus with failed 62X relay would maintain connection to grid. Other buses would load to diesel. Two Vital buses would be available for safe shutdown. Therefore previously analyzed.	Alarm in control room. Bus with failed 62X relay would maintain connection to grid. Other buses would load to diesel. Two Vital buses would be available for safe shutdown. Therefore previously analyzed.
Potential Transformer	Same as undervoltage relay failure	Same as undervoltage relay failure
Potential Transformer Primary Fuse	Same as undervoltage relay failure	Same as undervoltage relay failure

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