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SUBJECT: Submits addl info re proposed license amend revised Tech Specs.

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MHA-2

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NOVEMBER 0 3 1989

L-89-329
10 CFR 50.90

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

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Proposed License Amendment
Revised Technical Specifications
Additional Information

The purpose of this letter is to provide additional information to support the NRC review of FPL's proposed license amendment to implement the Revised Technical Specifications (RTS) for Turkey Point Units 3 and 4. This license amendment was submitted by an FPL letter (L-89-201) dated June 5, 1989 and a package of expected Final Safety Analysis Report (FSAR) revisions was provided by FPL letter (L-89-235) dated July 12, 1989. The following information is provided to further assist in the review process:

1. Attachment 1 contains proposed changes to the FSAR to add Reactor Protection System and Engineered Safety Feature Actuation setpoints to Chapter 7 and to delete reference to operational values of these setpoints found in various logic diagrams. Also included is a clarification of the description of control room ventilation isolation initiation.

2. Attachment 2 consists of proposed FSAR changes for Chapter 6 to add the list of existing automatic containment isolation valves which are required by RTS 3.6.4. New FSAR Table 6.6-3 lists automatic valves receiving Containment Phase A, Phase B, and Containment Ventilation Isolation signals in FSAR Table 6.6-1 which are required to meet Turkey Point General Design Criteria 53. This list does not represent a change from our current Technical Specification (T.S. 3.3.3) which specifies isolation valves receiving Phase A, Phase B and Containment Ventilation Isolation signals. The isolation times listed with the valves, reference the In Service Test (IST) program requirements with the exception of the

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A001
1/1

containment purge valves which are based on accident analysis assumptions. Minor text changes are also included which provide clarification and continuity.

3. Attachment 3 consists of proposed FSAR changes to clarify the auxiliary feedwater actuation signals. To clarify one of the actuating signals, a minor revision is also provided in the listing of Loss of Power setpoints. The coincident open diesel generator breaker, which is needed to complete the loss of power logic, is added to the engineered safety feature actuation system instrumentation setpoint table.

4. Attachment 4 provides an explanation of the basis for selected RTS parameters and setpoints. The majority of these parameters are not found in the Current Technical Specifications or in the FSAR.

As provided previously in our July 12, 1989 letter, the revisions proposed in Attachments 1, 2 and 3 are subject to subsequent modification for editorial purposes or to incorporate other non-related changes as part of the FSAR update activities performed under 10 CFR 50.71.

In addition, in order to clarify the testing requirements for the emergency containment coolers (ECCs) in RTS 4.6.2.2.a, we request that the Surveillance Requirements and the Bases for this specification be modified. The proposed RTS changes are indicated in Attachment 5. These changes were discussed with the NRC Staff on September 28, 1989. This modification clarifies the Surveillance Requirement to ensure that the cooling water flow obtained in the surveillance test correlates to the 2,000 gpm flow required for the design basis condition. The surveillance frequency shown in the RTS is also changed from monthly to once per 18 months. We understand the monthly frequency is more appropriate for plants using service water systems for cooling which could result in tube fouling if not checked on a frequent basis. Because Turkey Point uses component cooling water for ECC cooling, rapid fouling is not expected, and an 18-month interval is appropriate. This interval is consistent with the current technical specification surveillance requirement. Also included in this attachment are marked up pages to clarify the containment isolation initiation under safety injection and to clarify the manual alignment of containment spray. We understand these changes are acceptable to the NRC Staff.

The RTS represents a large increase in the level of detail compared to the current Technical Specifications. As the staff is aware, the Turkey Point FSAR does not contain a comparable level of

detail. Further, the FSAR often describes equipment capabilities, which do not represent design basis requirements. The NRC staff's independent auditor had comments on the comparison of sections of the RTS and FSAR. Resolution of these comments required no technical changes to the RTS. Proposed FSAR changes resulting from the auditor's comments are reflective of the Turkey Point FSAR level of detail and editorial style. Increasing the level of detail or descriptive style of the FSAR to match the RTS was not included in the scope of the upgrade project as previously agreed upon by FPL and NRC management.

Should there be any questions on this information, please contact us.

Very truly yours,

K.N. HARRIS by [signature]

K. N. Harris
Vice President
Turkey Point Plant Nuclear

KNH/PLP/gp

Attachments

cc: Mr. Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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ATTACHMENT 1

REACTOR PROTECTION SYSTEM AND ENGINEERED SAFETY FEATURES SETPOINTS FSAR CHANGES

During power operation, a sufficient amount of rapid shutdown capability in the form of control rods is administratively maintained by means of the control rod insertion limit monitors. Administrative control requires that all shutdown group rods be in the fully withdrawn position during power operation.

A list of reactor trips, means of actuation, and the coincident circuit requirements is given in Table 7.2-1. The interlock circuits, referred to in Table 7.2-1, are listed in Table 7.2-2.

Manual Trip

The manual actuating devices are independent of the automatic trip circuitry, and are not subject to failures which make the automatic circuitry inoperable. Either of two manual trip devices located in the control room can initiate a reactor trip.

High Nuclear Flux (Power Range) Trip

This circuit trips the reactor when two of the four power range channels read above the trip set-point. There are two independent trip settings, a high and a low setting. The high trip setting provides protection during normal power operation. The low setting which provides protection during startup can be manually bypassed when two out of the four power range channels read above approximately 10% power (P10). Three out of the four channels below 10% automatically reinstates the trip function. The high setting is always active.

High Nuclear Flux (Intermediate Range) Trip

This circuit trips the reactor when one out of the two intermediate range channels reads above the trip set-point. This trip which provides protection during reactor startup can be manually bypassed if two out of four power

TABLE 7.2-1

LIST OF REACTOR TRIPS & CAUSES OF ACTUATION OF: ENGINEERED SAFETY FEATURES, CONTAINMENT AND ~~STEAM~~ LINE ISOLATION & AUXILIARY FEEDWATER

	REACTOR TRIP	TRIP SETPOINT	COINCIDENCE CIRCUITRY AND INTERLOCKS	COMMENTS
1.	Manual	NA	1/2, no interlocks	
2.	High neutron flux	≤ 109% of RTP*	2/4, no interlocks	High and low settings; manual block and automatic reset of low setting by P-10, Table 7.2-2
3.	Overtemperature ΔT	NOTE 1	2/3, no interlocks	
4.	Overpower ΔT	NOTE 2	2/3, no interlocks	
5.	Low pressurizer pressure (fixed set point)	≥ 1835 psig	2/3, interlocked with P-7	
6.	High pressurizer pressure (fixed set point)	≤ 2385 psig	2/3, no interlocks	
7.	High pressurizer water level	≤ 92% of instrument span	2/3, interlocked with P-7	
8.	Low reactor coolant flow	≥ 80,550 gpm	2/3 per loop, interlocked with P-7, and P-8	Low flow in 2 loops permitted below P-7. Low flow in 1 loop permitted below P-8.
9.	Monitored electrical supply to reactor coolant pumps:			
9A.	Undervoltage	≥ 2496 Volts	Loss of power on 1 out of 2 on each of 2 buses	
9B.	Underfrequency	≥ 56.1 Hz	Under frequency on 1 out of 2 on each of 2 buses	Under frequency on 2 out of 2 buses will trip all reactor coolant pumps and consequently cause reactor trip; interlocked with P-7 and P-8.

* RTP = RATED THERMAL POWER

TABLE 7.2-1

	REACTOR TRIP	COINCIDENCE CIRCUITRY AND INTERLOCKS	COMMENTS
9C	Reactor coolant pump breakers	interlocked with P-7 and P-8	
10.	Safety injection signal (Actuation)	Low pressurizer pressure (2/3), or 2/3 high containment pressure; or 2/3 high differential pressure between any steam line header and steam line; or 2/3 high steam flow in coincidence with 2/3 low T_{avg} or 2/3 steam line pressure, or manual 1/2 (See 7.2 System Description-Protective Action for Interlocks).	
11.	Turbine-generator trip	2/3, low auto stop oil pressure interlocked with P-7, or 2/2 stop valve closure indication (interlocked with P-7)	
12.	Steam/Feedwater flow mismatch, coincident with low steam generator level	1/2, (steam/feedwater flow mismatch) in coincidence with 1/2 low steam generator water level per loop	
13.	Low-low steam generator water level	2/3, per loop	
14.	Intermediate range neutron flux	1/2, manual block permitted by P-10	Manual block and automatic reset
15.	Source range neutron flux	1/2, manual block permitted by P-6, interlocked with P-10	Manual block and automatic reset

INSERT I

INSERT 1

TRIP SETPOINT

9c. NA

10. NA

11. $\geq$ 45 psig
FULLY CLOSED

12. FEED FLOW $\leq$ 0.64 X 10^6 lb/hr
BELOW STEAM FLOW

$\geq$ 15% of narrow range instrument span

13. $\geq$ 15% of narrow range instrument span

14. $\leq$ 25% of RTP

15. $\leq$ 1 x 10^5 CPS

[illegible]

TABLE 7.2-1

CONTAINMENT ISOLATION ACTUATION	TRIP SET POINT	COINCIDENCE CIRCUITRY AND INTERLOCKS	COMMENTS
16. Phase A - Safety Injection Signal	NA	See Item 10; 2 momentary push buttons, pressing of either push button (1/2) will actuate.	Actuates all non-essential service containment isolation trip valves.
17. Phase B - Containment pressure	NA	Coincidence of two 2/3 containment Hi pressure and 2/3 Hi-Hi pressure, (same signal which actuates containment spray), or manual 2/2	Actuates all essential service containment isolation trip valves
18. High containment activity	INSERT A INSERT B	High activity signal, from air particulate detector or radiogas detector. (1/2)	This additional signal closes containment purge supply and exhaust valves.
ENGINEERED SAFETY FEATURES ACTUATION			
19. Safety injection signal (s)	INSERT 2	See Item 10	
20. Containment spray signal (P)	INSERT 3	2 out of 3 high containment pressure in coincidence with 2/3 High-High containment pressure; or manual 2 out of 2.	
21. Emergency containment cooling and filtering	NA	Safety injection signal initiates starting of all fans in accordance with the Safety Injection Starting Sequence.	

FD

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE#
3. Containment Isolation		
a. Phase "A" Isolation		
1) Manual Initiation	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
3) Safety Injection	See Item 1 above for all Safety Injection Trip Setpoints and Allowable Values.	
b. Phase "B" Isolation		
1) Manual Initiation	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
3) Containment Pressure--High-High	≤30.0 psig	≤[ ] psig
Coincident with: Containment Pressure--High	≤6.0 psig	≤[ ] psig
c. Containment Ventilation Isolation		
1) Containment Isolation Manual Phase A or Phase B	N.A.	N.A.
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
3) Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
4) Containment Radio-activity--High (1)	Particulate (R-11) <6.1×10^5 CPM Gaseous (R-12) See (2)	[ ]

INSERT A

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[illegible]

FY

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE#
9. Control Room Isolation (Continued)		
c. Containment Radioactivity--High (1)	Particulate (R-11) <6.1 x 10^5 CPM Gaseous (R-12) See (2)	[ ]
d. Containment Isolation Manual Phase A or Phase B	N.A.	N.A.
e. Air Intake Radiation Level	≤ 2 mR/hr	~~[ ]~~ 2.83 mR/hr

TABLE NOTATIONS

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

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

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

Setpoint may vary according to current plant conditions provided that the release rate does not exceed allowable limits provided in Specification 3.11.2.1.

INSERT B

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

#If no allowable value is specified so indicated by [ ], the trip setpoint shall also be the allowable value.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

INSERT 2

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE#
1. Safety Injection (Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Isolation, Start Diesel Generators, Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)		
a. Manual Initiation	N.A.	N.A.
b. Automatic Actuation Logic	N.A.	N.A.
c. Containment Pressure--High	≤6 psig	≤[ ] psig
d. Pressurizer Pressure--Low	≥1715 psig	≥[ ] psig
e. High Differential Pressure Between the Steam Line Header and any Steam Line.	≤150 psi	≤[ ] psi
f. Steam Line Flow--High	≤A function defined as follows: A Δp corresponding to 0.64×10^6 lbs/hr at 0% load increa-ing linearly to a Δp corresponding to 3.84×10^6 lbs/hr at full load.	[ ]
Coincident with: Steam Generator Pressure--Low	≥600 psig	≥[ ] psig
or T_{avg}--Low	≥531°F	≥[ ]°F
2. Containment Spray		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Containment Pressure--High-High Coincident with:	≤30.0 psig	≤[ ] psig
Containment Pressure--High	≤6.0 psig	≤[ ] psig

INSERT3

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STEAM LINES ISOLATION ACTUATION	TRIP SETPOINT	COINCIDENCE CIRCUITRY AND INTERLOCKS	COMMENTS
22. Steam Flow	INSERT 4	High steam line flow in 2 out of 3 loops coincident with either low T_{avg} in 2 out of 3 loops or low steam line pressure in 2 out of 3 loops.	
23. Containment pressure	high ≤ 6.0 psig high-high ≤ 30.0 psig	2/3 high containment pressure signal in coincidence with 2/3 high-high containment pressure	
24. Manual per steam loop	NA	1/1 per steam line	
AUXILIARY FEEDWATER ACTUATION			
25. Turbine driven pumps		Coincidence of 2/3 low-low level in any steam generator; or loss of voltage on both 4160 volt buses; or auto trip of main feed water pumps, or safety injection signal; or manual 1/2	
MAIN FEEDWATER ISOLATION			
26A. Close main feedwater control valves (fast closure)		Actuated by: 1. Safety injection (see #10) 2. 2/3 high-high feedwater level (80%) in steam generator 3. Reactor trip coincident with low T_{avg} (slow closure)	
26B. Close bypass feedwater control valves		1. Safety injection or high-high level in steam generators	
27. Trip steam generator feed pumps		Safety injection signal	
28. ~~Turbine and~~ Main feedwater pumps and Turbine trip		Coincidence of 2/3 high-high level (80%) in any steam generator	

+y

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM
INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE#
4. Steam Line Isolation		
a. Manual Initiation	N.A.	N.A
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
c. Containment Pressure--High-High Coincident with:	≤30.0 psig	≤[ ] psig
Containment Pressure--High	≤6.0 psig	≤[ ] psig
f. Steam Line Flow--High	≤A function defined as follows: A Δp corresponding to 0.64 x 10^6 lbs/hr at 0% load increasing linearly to a Δp corresponding to 3.84 x 10^6 lbs/hr at full load.	[ ] INSERT 4
Coincident with: Steam Line Pressure--Low	≥600 psig	≥[ ] psig
or T_{avg}--Low	≥531°F	≥[ ]°F
5. Feedwater Isolation		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
6. Auxiliary Feedwater (3)		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Steam Generator Water Level--Low-Low	≥15% of narrow range instrument span.	≥[ ]% of narrow range instrument span.
c. Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	

FEB 28 1993

TABLE 7.2-1 (Continued)

TABLE NOTATIONS

NOTE 1: OVERTEMPERATURE ΔT

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

Where:

ΔT	=	Measured ΔT by RTD Instrumentation;
$\frac{1}{1+\tau_1 S}$	=	Lag compensator on measured ΔT;
τ_1	=	Time constants utilized in the lag compensator for ΔT, ~~τ_1 = 2 s;~~ τ_1 + RTD Response time = 2.5 s;
ΔT_o	=	Indicated ΔT at RATED THERMAL POWER;
K_1	=	1.095;
K_2	=	0.0107/°F;
$\frac{1+\tau_2 S}{1+\tau_3 S}$	=	The function generated by the lead-lag compensator for T_{avg} dynamic compensation;
τ_2, τ_3	=	Time constants utilized in the lead-lag compensator for T_{avg}, τ_2 = 25s, τ_3 = 3 s;
T	=	Average temperature, °F;
$\frac{1}{1+\tau_4 S}$	=	Lag compensator on measured T_{avg};
τ_4	=	Time constant utilized in the measured T_{avg} lag compensator, ~~τ_4 = 2 s;~~ τ_4 + RTD response time = 2.5 s;
T'	≤	574.2°F (Nominal T_{avg} at RATED THERMAL POWER);
K_3	=	0.000453/psig;
P	=	Pressurizer pressure, psig;

~~TURKEY POINT - UNITS 3 & 4~~ 2-7 ~~AMENDMENT NOS. AND~~ ~~FEB 23 1989~~

TABLE 7.2-1 (Continued)

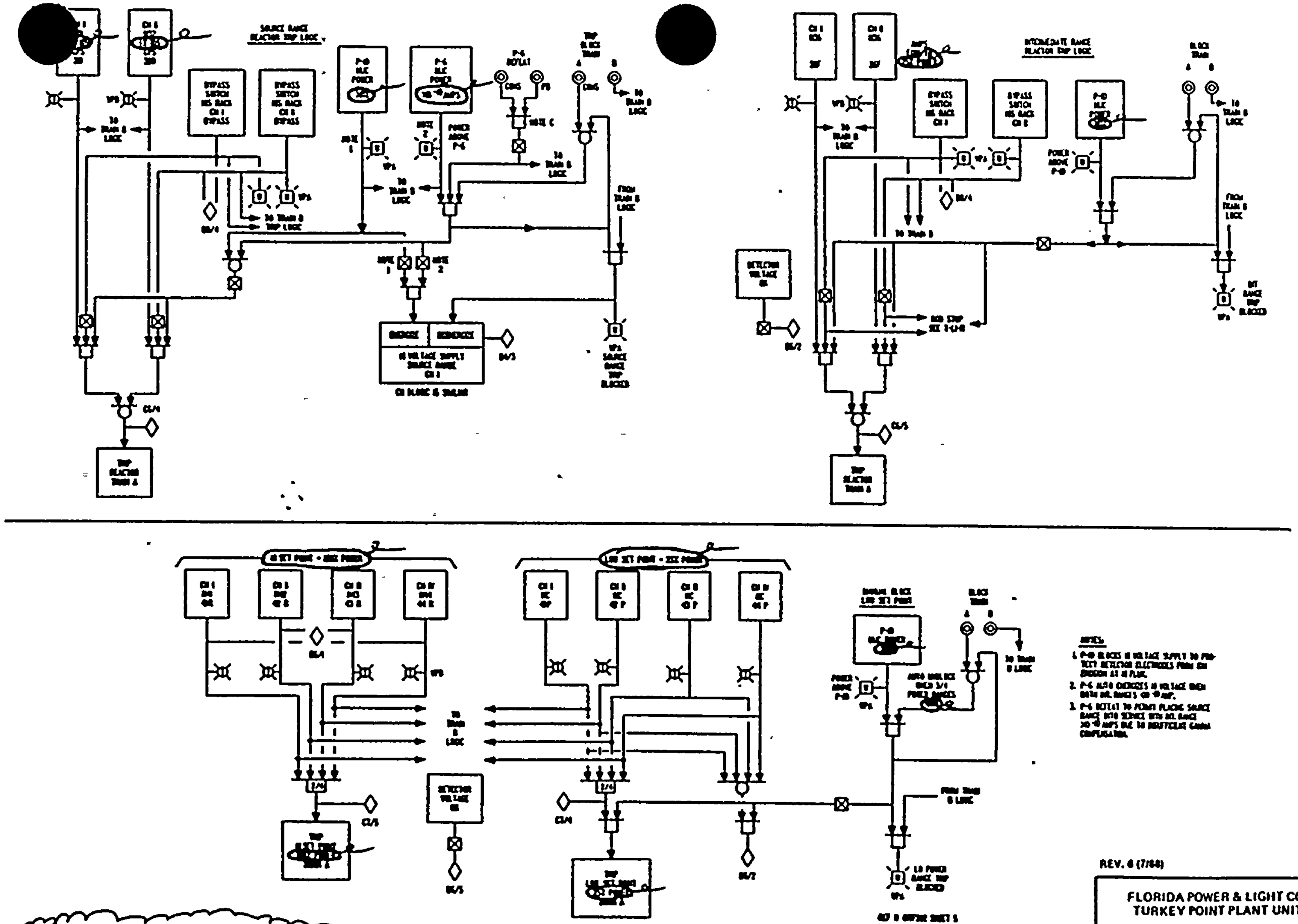
TABLE NOTATIONS (Continued)

NOTE 2: OVERPOWER ΔT

$$\Delta T \left(\frac{1}{1+\tau_1 S}\right) \le \Delta T_0 \left\{K_4 - K_5 \left(\frac{\tau_5 S}{1+\tau_5 S}\right)\left(\frac{1}{1+\tau_4 S}\right) T - K_6 \left[T \left(\frac{1}{1+\tau_4 S}\right) - T''\right] - f(\Delta I)\right\}$$

Where:

ΔT	=	As defined in Note 1,
$\frac{1}{1+\tau_1 S}$	=	As defined in Note 1,
τ_1	=	As defined in Note 1,
ΔT_0	=	As defined in Note 1,
K_4	=	1.09,
K_5	=	0.02/°F for increasing average temperature and 0 for decreasing average temperature,
$\frac{\tau_5 S}{1+\tau_5 S}$	=	The function generated by the rate-lag compensator for T_{avg} dynamic compensation,
τ_5	=	Time constants utilized in the rate-lag compensator for T_{avg}, τ_5 = 10 s,
$\frac{1}{1+\tau_4 S}$	=	As defined in Note 1,
τ_4	=	As defined in Note 1,



For Reactor Trip and Interlock Setpoints SEE TABLE 7.2-1

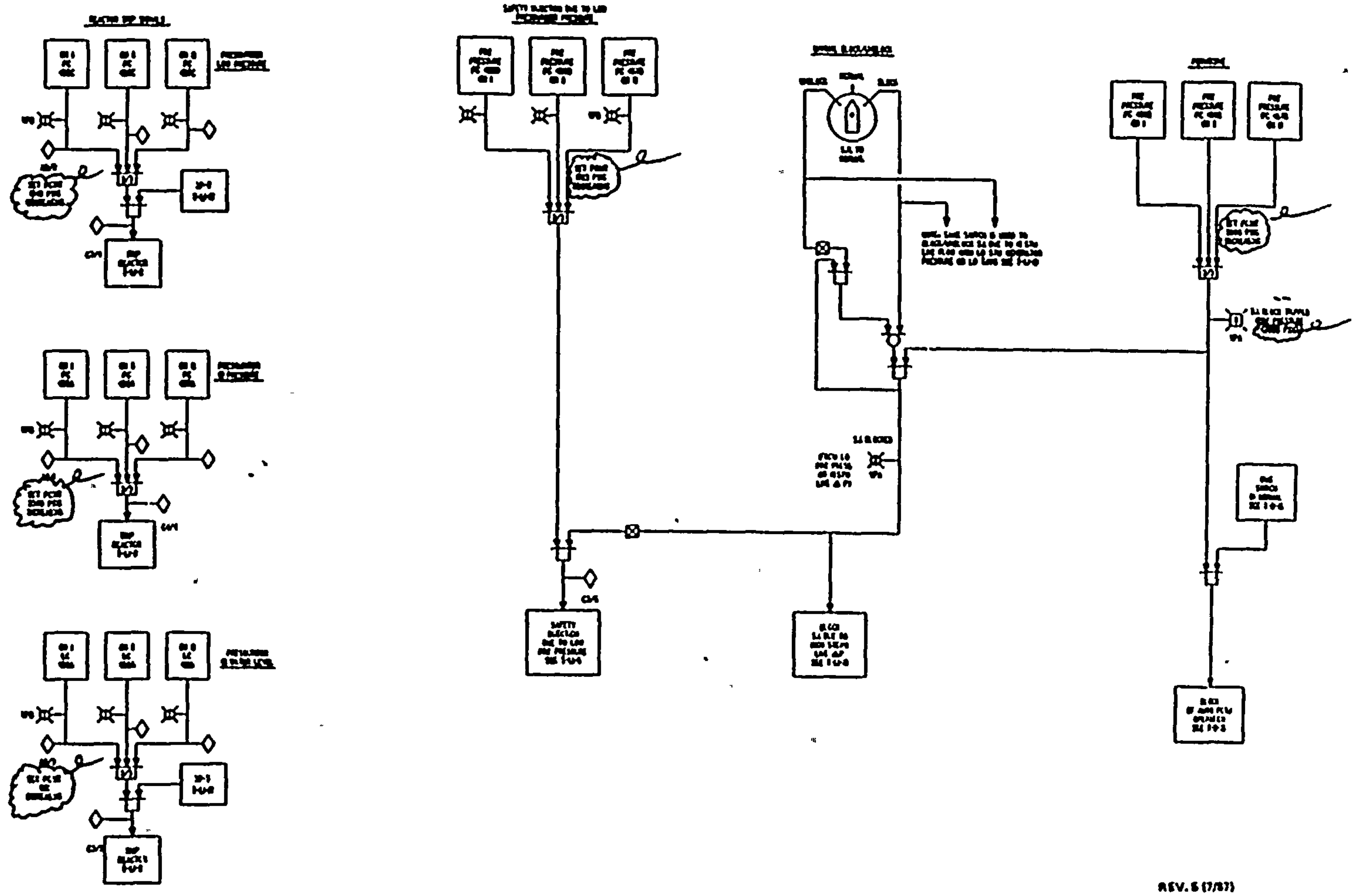
REV. 6 (7/88)

REF DWG: 5610-T-L1 SH. 10 (REV. 6)

FLORIDA POWER & LIGHT COMPANY
TURKEY POINT PLANT UNITS 3 & 4

NUCLEAR INSTRUMENTATION
TRIP SIGNALS
OPERATING DIAGRAMS

FIGURE 7.4-2a



For Reactor Trip and Interlock Setpoints SEE TABLE 7.2-1

REV. 6 (7/87)

REF DWG: 5610-T-LI SH. 18 (REV. 7)

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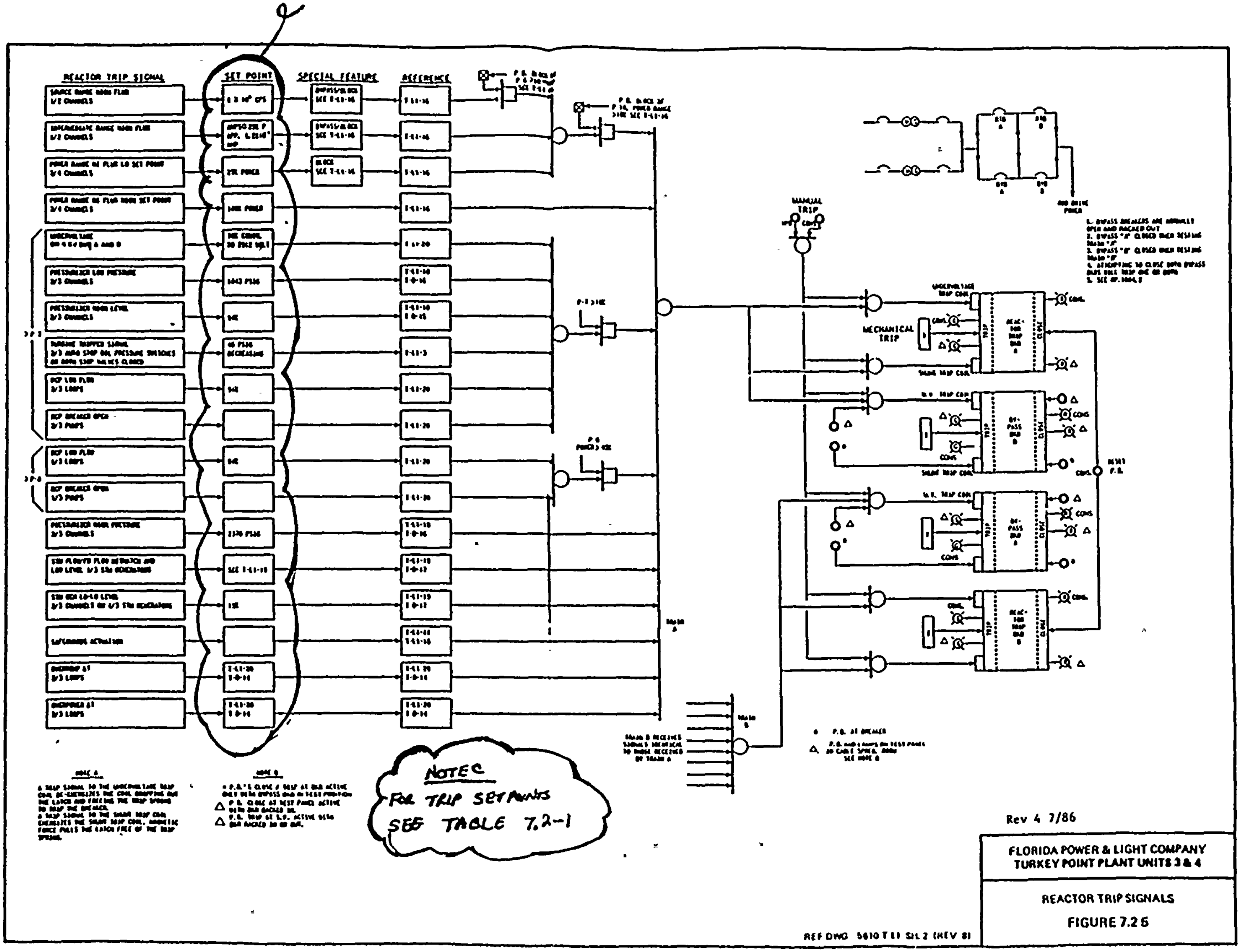
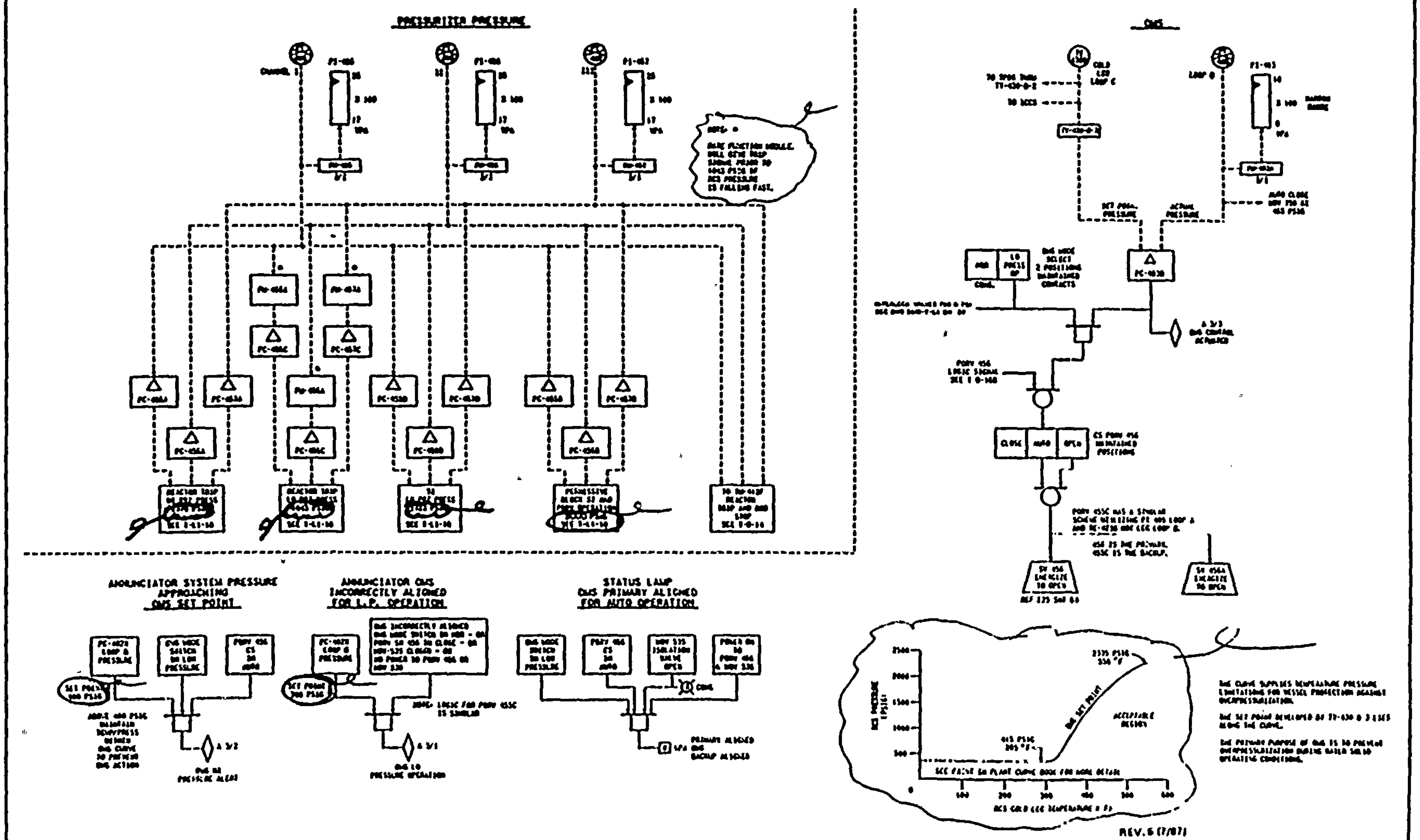
TURKEY POINT PLANT UNITS 3 & 4

PRESSURIZER CAUSED REACTOR TRIP & SAFETY INJECTION LOGIC DIAGRAM

FIGURE 7.2-8a


REACTOR TRIP SIGNAL
SET POINT
SPECIAL FEATURE
REFERENCE
MANUAL TRIP
MECHANICAL TRIP
NOTES
FOR TRIP SET POINTS
SEE TABLE 7.2-1
Rev 4 7/86
FLORIDA POWER & LIGHT COMPANY
TURKEY POINT PLANT UNITS 3 & 4
REACTOR TRIP SIGNALS
FIGURE 7.2 6



REV. 6 (7/87)

REF DWG 5610 T D 0016A SH 1 (REV 4)

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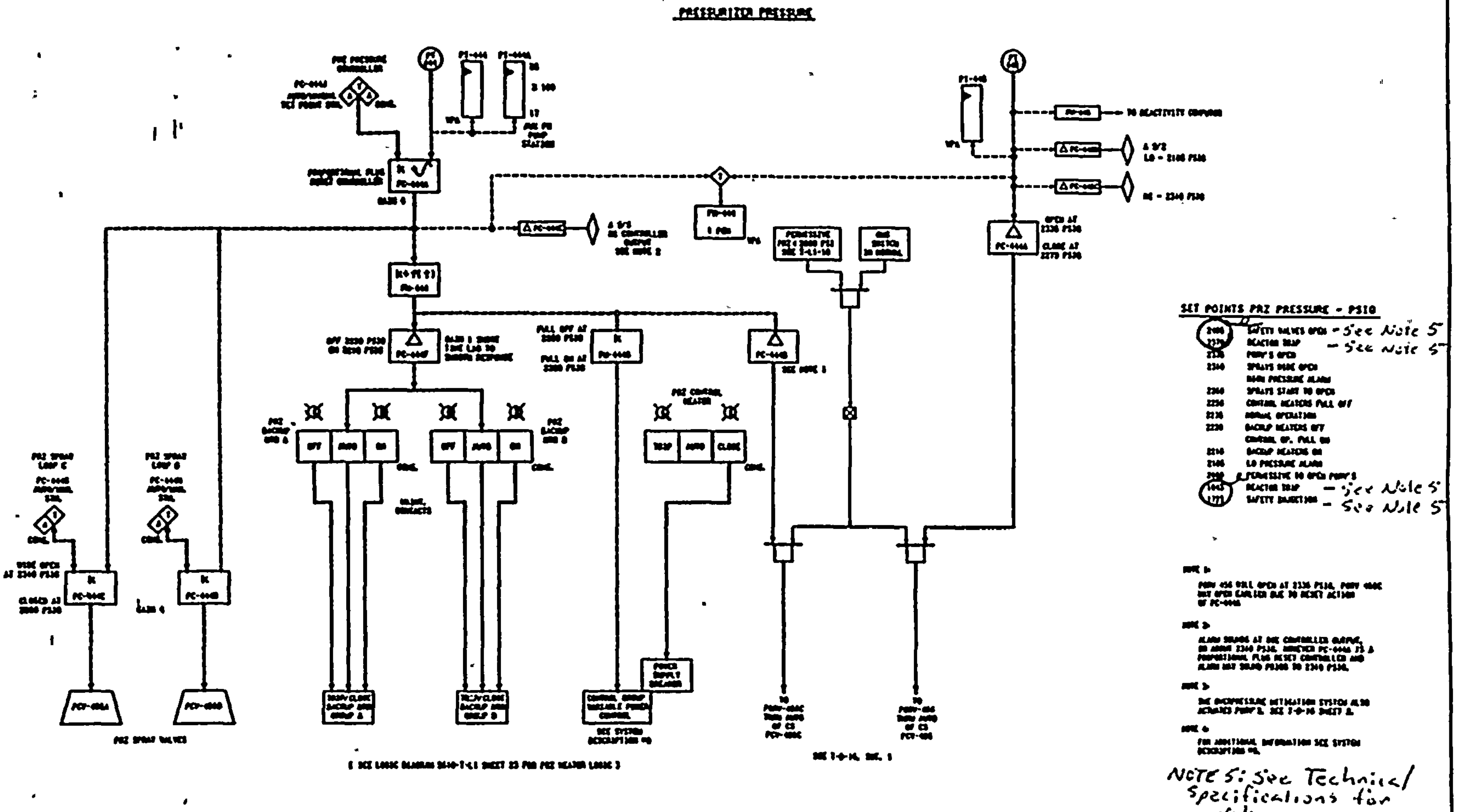
TURKEY POINT PLANT UNITS 3 & 4

PRESSURIZER PRESSURE PROTECTION & OVERPRESSURE MITIGATION SYSTEM CONTROL SYSTEM DIAGRAM

FIGURE 7.2-11a



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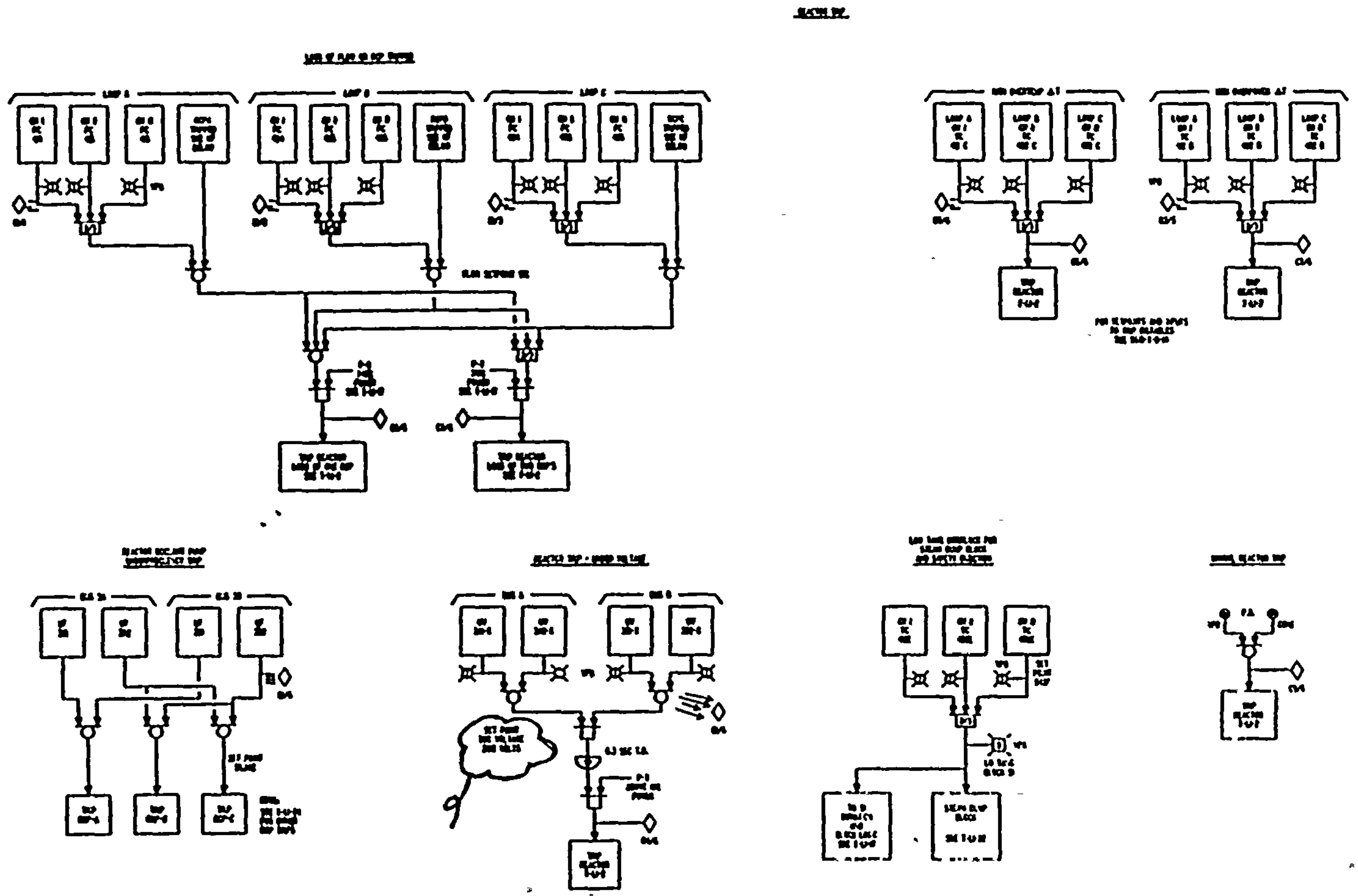
TURKEY POINT PLANT UNITS 3 & 4

PRESSURIZER PRESSURE CONTROL
CONTROL SYSTEM DIAGRAM

FIGURE 7.2-11b

REF DWG: 5610-T-D-0016B (REV. 1)



FOR SET POINTS SEE TABLE 7.2-1

REV. 8 (7/87)

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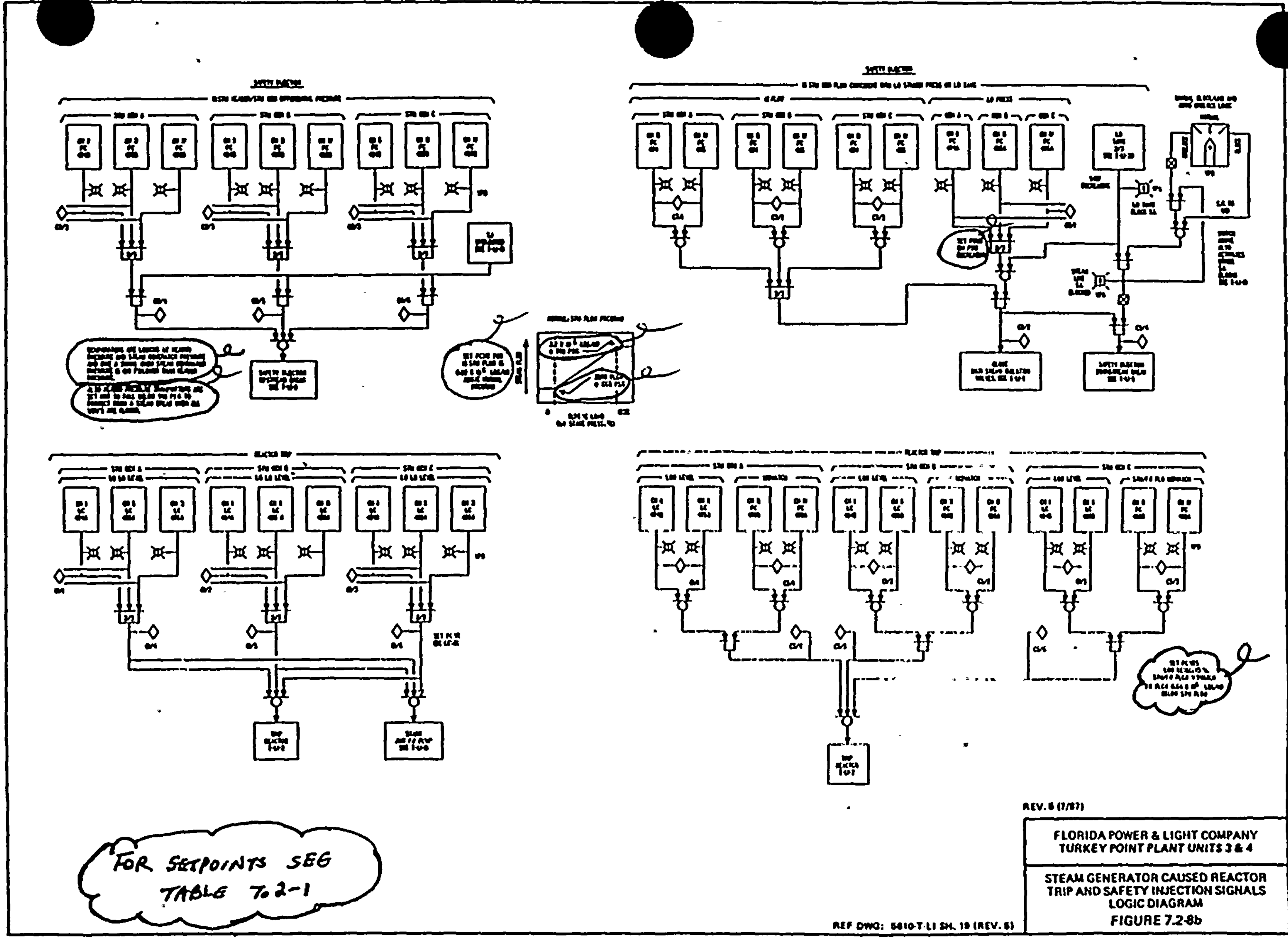
PRIMARY COOLING SYSTEM
REACTOR TRIP & TAVG INTERLOCK
LOGIC DIAGRAM
FIGURE 7.2-8c

REF DWG: 5610-T-L1 SH. 20 (REV. 8)



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TURKEY POINT PLANT UNITS 3 & 4

STEAM GENERATOR CAUSED REACTOR TRIP AND SAFETY INJECTION SIGNALS LOGIC DIAGRAM

FIGURE 7.2-8b

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]
[illegible]

9.9.3 CONTROL ROOM VENTILATION ISOLATION

Recirculation Phase

In the unlikely event of an MHA the control room air conditioning will automatically be placed in a recirculation phase. The fresh air dampers, exhaust fans and dampers to the cable spreading room, locker and toilet, and shower areas will automatically close. ~~The containment Phase A isolation signal which includes high containment pressure or SIS will automatically activate the recirculation phase.~~ INSERT A

The following provisions are made to reduce unfiltered infiltration and pressurize the control room:

1. Automatic start, opening or closing signal, as required for emergency for SF-1 and dampers D-1, D-2, D-3 and D-11.

2. Temporary motor operated isolation dampers at fans EF-8 and EF-9, including automatic closure signal to the damper D-14 to EF-9 and damper D-22 to EF-20.

3. Two volume control dampers, one in the emergency makeup supply D-20 and one in the recirculation duct D-21 to SF-1.

4. Supply and return ducts added to the mechanical equipment room. A controlled air leakage type door is installed.

5. Sealed opening in mechanical equipment room doors and walls, in Control Cabinet Rooms 212 and 213, in duct seams on the suction and supply side of Exhaust Fan EF-7, and in roof, floor and wall penetrations.

[illegible]

Insert A

"The recirculation phase is automatically actuated in the event of a safety injection signal, or high containment Radiation Monitor signal (R-11, R-12), or Air Intake Radiation level signal."

ATTACHMENT 2

CONTAINMENT ISOLATION VALVE CLOSURE TIMES

TABLE 6.6-3

CONTAINMENT ISOLATION VALVE CLOSURE TIMES

A. Phase "A" Isolation Valves

VALVE NUMBER (Note 1)	PENETR NUMBER	SYSTEM/FUNCTION	CLOSURE TIME (SECONDS)
CV-*-200A	14	CVCS Normal Letdown	Note 2
CV-*-200B	14	CVCS Normal Letdown	Note 2
CV-*-200C	14	CVCS Normal Letdown	Note 2
CV-*-204	14	CVCS Normal Letdown	Note 2
MOV-*-381	25	CVCS Excess Letdown/RCP Seal Water Return	Note 2
CV-*-516	5	PRT Gas Analyzer Sample	Note 2
CV-*-519A	7	PRT Makeup Primary Water Supply	Note 2
CV-*-739	13	CCW Return from Excess Letdown HX	Notes 3, 5
CV-*-855	42	Nitrogen Supply to Accumulators	Note 2
CV-*-956A	8	Pressurizer Steam Space Sample	Note 2
CV-*-956B	9	Pressurizer Liquid Space Sample	Note 2
CV-*-956D	55	Accumulator Sample	Note 2
MOV-*-1417	21	CCW Supply to Normal CTMT Coolers	Notes 2, 5
MOV-*-1418	22	CCW Return from Normal CTMT Coolers	Notes 2, 5
CV-*-2821	23	Containment Sump Discharge	Note 2
CV-*-2822	23	Containment Sump Discharge	Note 2
SV-*-2911	33	Containment Air Sample	Note 2
SV-*-2912	32	Containment Air Sample Return	Note 2
SV-*-2913	33	Containment Air Sample	Note 2
CV-*-4658A	10	RC Drain Tank Vent	Note 2
CV-*-4658B	10	RC Drain Tank Vent	Note 2
CV-*-4659A	31	RC Drain Tank Gas Analyzer Sample	Note 2
CV-*-4659B	31	RC Drain Tank Gas Analyzer Sample	Note 2
CV-*-4668A	52	RC Drain Tank Pump Discharge	Note 2
CV-*-4668B	52	RC Drain Tank Pump Discharge	Note 2
CV-*-6165	30	Breathing Air Supply	Note 4
SV-*-6385	5	PRT Gas Analyzer	Note 2
MOV-*-6386	25	CVCS Excess Letdown/RCP Seal Water Return	Note 2
SV-*-6428	20	RCS Hot Leg Sample	Note 2

TABLE 6.6-3 (continued)

CONTAINMENT ISOLATION VALVE CLOSURE TIMES

B Phase "B" Isolation Valves

VALVE NUMBER Note 1)	PENETR NUMBER	SYSTEM/FUNCTION	CLOSURE TIME (SECONDS)
MOV-*-626	43	CCW Return from RCP Thermal Barrier CLRS	Notes 2, 5
MOV-*-716A	3	CCW Supply to RCPs	Notes 2, 5
MOV-*-716B	3	CCW Supply to RCPs	Notes 2, 5
MOV-*-730	4	CCW Return from RCP Oil Coolers	Notes 2, 5

C Containment Ventilation Isolation Valves

VALVE NUMBER (Note 1)	PENETR NUMBER	SYSTEM/FUNCTION	CLOSURE TIME (SECONDS)
POV-*-2600	35	Containment Purge Supply	5
POV-*-2601	35	Containment Purge Supply	5
POV-*-2602	36	Containment Purge Exhaust	5
POV-*-2603	36	Containment Purge Exhaust	5
CV-*-2819	63	Instrument Air Bleed	Note 2
CV-*-2826	63	Instrument Air Bleed	Note 2

NOTES:

1. * = Unit number (3 or 4)

2. The isolation times of each automatic valve shall be within the limits established for testing in accordance with Section XI of ASME Boiler and Pressure Vessel code and applicable Addenda as required by 10 CFR 50.55 a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i).

3. Testing requirements are per letter L-89-358 from J. H. Goldberg to U. S. Nuclear Regulatory Commission dated October 3, 1989.

4. CV-*-6165 is locked closed, and is not required to be stroke time tested.

5. Valve is not subject to Type C local leak rate testing of 10CFR50, Appendix J.

[illegible]

event of a loss-of-coolant accident.

Isolation of a line inside the containment prevents flow from the reactor coolant system or any other large source of radioactive fluid in the event that a piping rupture outside the containment occurs. A piping rupture outside the containment, at the same time as a loss-of-coolant accident occurs, is not considered credible.

Closure times for the purge ~~isolation~~ valves are such that, upon demand by their respective isolation signal, the requirements of integrity at peak containment pressure and temperature for the double-ended coolant line break are met.

INSERT A

Containment isolation becomes mandatory under the same conditions that require operation of the other engineered safeguards. The containment isolation signal is derived from the same signals which automatically activate safety injection.

Main Steam, Blowdown, Feedwater and Engineering Safeguards Lines penetrating the containment have been designed to assure that they are capable of withstanding the maximum hypothetical earthquake.

To assure their adequacy in this respect:

(a) Valves are located in a manner to reduce the accelerations on the valves. Piping spans have been designed for adequacy of the loads to which the span would be subjected. Valves are mounted in the position recommended by the manufacturer.

(b) Earthquake forces on the operating parts of the valve are calculated to be small compared to the other forces present in the piping system.

(c) Control cables to the valve operators are designed and installed to assure that the flexure of the line does not endanger the control system. Appendages to the valve, such as position indicators and operators, are designed for structual adequacy.

Containment Isolation Valve Criterion

Penetrations that require closure for the containment functions are protected by ~~Isolation valves for all fluid system lines penetrating the containment provide~~ at least two barriers for redundancy against leakage of radioactive fluids to the environment in the event of a loss-of-coolant accident. These barriers, in the form of isolation valves or closed systems, are defined on an individual line basis. ~~In addition to satisfying containment isolation criteria, the valving is designed to facilitate normal operation and maintenance of the systems and to ensure reliable operation of other engineered safeguards systems.~~ INSERT B

With respect to numbers and locations of isolation valves, the criteria applied are generally those outlined by the five categories described herein.

6.6.2 SYSTEM DESIGN

The five general categories listed below, describe the methods by which lines penetrating containment may be classified. Also described are the basic isolation valve arrangements used to provide two barriers between the Reactor Coolant System or containment atmosphere and the environment. for those penetrations that are required for the containment function. System design is such that failure of one valve to close does not prevent isolation, and no manual operation is required for immediate isolation. ~~Automatic isolation is initiated by high containment pressure Safety Injection Signal and in the case of the purge valves by high radiation.~~

INSERT C

The end of the fuel transfer tube inside containment is closed by a double-gasketed blind flange, to prevent leakage of spent fuel pit water into the containment during operation. This flange also serves as protection against leakage from the containment following a loss of coolant accident. The space between these gaskets can also be pressurized by the penetration test system.

Also, as a special case, because of size, the containment purge supply and exhaust ducts are each equipped with two tight-sealing butterfly valves, one inside containment and one outside. As discussed in Subsection 9.8.2, the opening angle of the valves has been limited. These valves can be closed either manually or automatically upon a signal of high radioactivity level in the containment or by the containment isolation signal. These valves are normally closed during reactor power operation. See Table 6.6-2 for a single failure analysis of the containment purge valves. Debris screens are present upstream (with respect to Post LOCA flow) of the supply and exhaust purge valves. These debris screens will protect the containment isolation valves from debris that might follow as a result of a LOCA.

6.6.3 ISOLATION VALVES AND INSTRUMENTATION DIAGRAMS

Figure 6.6-1 shows all valve arrangements in lines leading to the atmosphere or to closed systems on both sides of the containment barrier. Figure 6.6-2 defines the nomenclature and symbols used.

Valve Parameters Tabulation

A summary of the fluid systems lines penetrating containment ~~and the valves and closed systems employed for containment isolation~~ is presented in Table 6.6-1. Each valve is described as to type, operator, position indication and open or closed status during normal operation, shutdown and accident conditions. Information is also presented on valve preferential failure mode and automatic trip by the containment isolation signal.

[illegible]

Containment isolation valves are provided with actuation and control equipment appropriate to the valve type. For example, air operated globe and diaphragm (Saunders Patent) valves are generally equipped with air diaphragm operators, with fail-safe operation ensured by redundant control devices in the instrument air supply to the valves. Motor operated gate valves are capable of being supplied from reliable on-site emergency power as well as their normal power source. Manual and check valves, of course, do not require actuation by control systems.

Containment isolation "trip" valves are actuated to the closed position by the containment isolation signal, derived automatically from the signals as listed in Table ~~6.6-1~~ 6.6-3. Non-automatic isolation valves, ie., remote stop valves and manual valves, are used in lines which must remain in service, at least for a time, following a MHA. These are closed manually if and when the lines are taken out of service. (INSERT D)

~~These valves equipped with air-diaphragm operators close in approximately two seconds. The typical closing time available for large motor operated gate valves is ten seconds.~~

The large butterfly valves used to isolate the containment purge ventilation ducts are equipped with air-cylinder operators, with spring returns. These valves fail to the closed position on loss of control signal or instrument air.

6.6.4 VALVE OPERABILITY

~~All containment isolation valves, actuators and controls are located so as to be protected against missiles which could be generated as the result of a loss-of-coolant accident. Only valves so protected are considered to qualify as containment isolation valves~~.

~~Only~~ Isolation valves located inside containment are subject to the high pressure, high temperature, steam laden atmosphere resulting from an accident. Operability of these valves in the accident environment is ensured by proper design, construction and installation, as reflected by the following considerations:

(a) All components in the valve installation, including valve bodies, trim and moving parts, actuators, instrument air lines and control and power wiring, are constructed of materials sufficiently temperature resistant to be unaffected by the accident environment. Special attention is given to electrical insulation, air operator diaphragms and stem packing material.

(b) In addition to normal pressures, the valves are designed to withstand maximum pressure differentials in the reverse direction imposed by the accident conditions. This criterion is particularly applicable to the butterfly type isolation valves used in the containment purge lines.

[illegible]

Insert A

"Closure times for other automatic isolation valves in lines that provide a direct pathway between the containment atmosphere and the environs are selected to minimize offsite radiological consequences and to assure that ECCS effectiveness is not degraded by a reduction in the containment backpressure following a LOCA."

INSERT B

"Table 6.6-3 provides a listing of required isolation valves that actuate on a Phase A, Phase B, or Containment Ventilation Isolation Signal. Automatic closure of the valves listed in Table 6.6-3 will achieve containment isolation in accordance with the requirements of GDC 53 and the plant Technical Specification. Additional automatic valves that receive an ESFA's signal for other than containment isolation purposes are not included in Table 6.6-3." Valves that provide a containment integrity function, but which are not isolated automatically (e.g., manual valves, check valves, remote manual valves) are also excluded from Table: 6.6-3.

INSERT C

Phase A Isolation is initiated by a Safety Injection signal. Phase B Isolation is initiated by Containment Pressure High-High coincident with Containment Pressure High. Containment Ventilation Isolation is initiated by Safety Injection or high Containment Radioactivity (R-11 or R12) signals.

INSERT D

"Table 6.6-3 lists closure times for containment isolation valves that receive an automatic isolation signal (Phase A, Phase B or Containment Ventilation Isolation). Valve capability to meet the required closure times is verified periodically during performance of the In-Service Testing (IST) Program. Operability requirements for these automatic isolation valves are as provided in the Technical Specifications."

ATTACHMENT 3

AUXILIARY FEEDWATER ACTUATION PARAMETERS

9.11.2 AUXILIARY FEEDWATER PUMPS

Three quick starting steam turbine driven, auxiliary feedwater pumps are provided for Turkey Point Units 3 and 4. Each pump is capable of delivering 600 gpm to the steam generators between 1085 psig at 5900 rpm and 120 psig at 3200 rpm.

The three pumps are installed such that each supplies auxiliary feedwater to either Unit 3 or 4, with any single pump supplying the total feedwater requirement of either unit. Two pumps (B&C) are normally aligned to AFW Train 2 and the third (A) is normally aligned to AFW Train 1.

The turbine driven pumps are supplied with steam from the unit which has lost its normal feedwater supply. RPM indicators are provided locally and in the control room to provide indication that the AFW pump/turbine is running. The turbines have an atmospheric exhaust. Steam can also be supplied from the unit having normal feedwater supply or from an auxiliary steam connection to Units 1 and 2. The supply valves will automatically open by any one of the following four signals.

1. Safety Injection
2. Low-Low Level in any of the three steam generators.
3. ~~Loss of voltage on either the A or B 4.16 kv bus.~~
4. Loss of both feedwater pumps under normal operating conditions.
5. ~~Undervoltage on one 480v load center and the diesel generator breaker open.~~

INSERT A

The turbine casing is provided with a sentinel type relief valve for warning purposes only.

Impulse type steam traps are provided upstream of the MOVs and drain to the condenser. The turbine casing drains, the exhaust pipe drain, the gland seal drain, the governor valve and the HP and LP steam leakoffs in the throttle trip valve drain to a drain trough. The pump recirculation is controlled by an orifice in the recirculation piping. The pumps continue to supply reduced amounts of water to the steam generators until steam pressure is reduced to 120 psig. The pump output in pounds per hour is greater than the steam consumption until the 120 psig point is reached. At this point the Residual Heat Removal System is started and the auxiliary feedwater pumps are shutdown.

Insert A

4. Bus Stripping

   a. Loss of voltage on either the A or B 4.16 KV bus.

   b. Degraded voltage on one 480V load center (instantaneous) coincident with safety injection and the diesel generator breaker open.

   c. Degraded voltage on one 480V load center (delayed) coincident with the diesel generator breaker open.

STEAM LINES ISOLATION ACTUATION	COINCIDENCE CIRCUITRY AND INTERLOCKS	COMMENTS
22. Steam Flow	High steam line flow in 2 out of 3 loops coincident with either low T_{avg} in 2 out of 3 loops or low steam line pressure in 2 out of 3 loops.	
23. Containment pressure	2/3 high containment pressure signal in coincidence with 2/3 high-high containment pressure	
24. Manual per steam loop	1/1 per steam line	
AUXILIARY FEEDWATER ACTUATION		
25. Turbine driven pumps	Coincidence of 2/3 low-low level in any steam generator; ~~or loss of voltage on both 4160 volt buses~~ or Bus Stripping; or auto trip of main feed water pumps, or safety injection signal; or manual 1/2	
MAIN FEEDWATER ISOLATION		
26A. Close main feedwater control valves (fast closure)	Actuated by: 1. Safety injection (see #10) 2. 2/3 high-high feedwater level (80%) in steam generator 3. Reactor trip coincident with low T_{avg} (slow closure)	
26B. Close bypass feedwater control valves	1. Safety injection or high-high level in steam generators	
27. Trip steam generator feed pumps	Safety injection signal	
28. Turbine and main feedwater pumps trip	Coincidence of 2/3 high-high level (80%) in any steam generator	

ATTACHMENT 4

SELECTED RTS SETPOINTS AND PARAMETERS

ADDITIONAL INFORMATION ON REVISED TECHNICAL SPECIFICATIONS PARAMETERS

RTS Table 2.2-1

PARAMETER: Intermediate Range Neutron Flux

DOCUMENT/SECTION/VALUE:

RTS: Table 2.2-1 CTS: N/A

$\leq$ 25% RTP

DISCUSSION: This trip provides core protection during reactor startup to mitigate the consequences of an uncontrolled rod cluster control assembly bank withdrawal from a subcritical condition. This value was provided by Westinghouse, and is the STS "generic" value for this function. This value is applicable to Turkey Point.

RTS Table 2.2-1

PARAMETER: Source Range Neutron Flux

DOCUMENT/SECTION/VALUE:

RTS: Table 2.2-1 CTS: N/A

$\leq 10^5$ CPS

DISCUSSION: This trip provides core protection during reactor startup to mitigate the consequences of an uncontrolled rod cluster control assembly bank withdrawal from a subcritical condition. This value was provided by Westinghouse, and is the STS "generic" value for this function. This value is applicable to Turkey Point.

RTS Table 2.2-1

PARAMETER: Reactor Coolant Flow-Low

DOCUMENT/SECTION/VALUE:

RTS: Table 2.2-1	CTS: 2.3
$\geq$ 90% of loop design flow	$\geq$ 90% of normal indicated flow

DISCUSSION: The RTS value is consistent with CTS 3.1.6.C, which requires Reactor Coolant flow of $\geq$ 268,500 gpm during power operation. This is equivalent to 89,500 gpm/loop, which is the RTS value for loop design flow.

RTS Table 2.2-1

PARAMETER: RTS Interlock, Intermediate Range Neutron Flux, P-6

DOCUMENT/SECTION/VALUE:

RTS: Table 2.2-1	CTS: N/A
$\geq 1 \times 10^{-10}$ amp	

DISCUSSION: On increasing power P-6 allows the manual block of the Source Range trip (i.e., prevents premature block of Source Range trip) and de-energizes the high voltage to the detectors. On decreasing power, Source Range Level trips are automatically reactivated and high voltage restored. (RTS Bases)

The setpoint of 1×10^{-10} amp provides a transition point between the Source Range and Intermediate Range. It is a STS "generic" value provided by Westinghouse, and is typical of many other Westinghouse plants. This value is applicable to Turkey Point.

RTS Table 2.2-1

PARAMETER: RTS Interlock, Low Power Reactor Trip Block, P-7

DOCUMENT/SECTION/VALUE:

RTS: Table 2.2-1	CTS: 2.3
≤ 10% RTP (P-10 Input)	≤ 10% RTP
≤ 10% Turbine Power (Turbine First Stage Pressure)	

DISCUSSION: RTS/CTS are equivalent for pressurizer low pressure, pressurizer high level and low flow in more than one reactor coolant loop. The RTS bases also specifies enables for two or more RCP breakers open, RCP bus undervoltage, and turbine trip. The RTS turbine power setpoint is an STS "generic" value supplied by Westinghouse, and is typical of many other Westinghouse plants. The generic interlock setpoint is applicable to Turkey Point because the Turkey Point reactor protection system setpoints are similar to other Westinghouse plants.

RTS B.2.2.1

PARAMETER: Trip delay and block on undervoltage trip (P-7)

DOCUMENT/SECTION/VALUE:

RTS: B.2.2.1	CTS: N/A
≤ 1.3 second delay from 10% power with 1st stage turbine pressure at 10%	

DISCUSSION: The RTS 1.3 second delay was verified by Westinghouse to be consistent with the Turkey Point Safety Analysis. The FSAR value of 1.6 seconds includes the time for reactor trip breaker to open and the rod to release.

RTS 3.1.1.4

PARAMETER: RCS Lowest Tavg

DOCUMENT/SECTION/VALUE:

RTS: 3.1.1.4 CTS: N/A

RCS lowest Tavg
≥ 541°F

DISCUSSION: The value of 541°F was provided by Westinghouse as the appropriate value. This limit ensures that (1) the moderator temperature coefficient is within its analyzed temperature range; (2) the trip instrumentation is within its normal operating range; (3) the pressurizer is capable of being in an OPERABLE status with a steam bubble; and (4) the reactor vessel is above its minimum RTNDT temperature (RTS BASES).

RTS 3.1.2.4.a.1

PARAMETER: BAST Volume, Modes 5 and 6

DOCUMENT/SECTION/VALUE:

RTS: 3.1.2.4.a.1 CTS: N/A

BAST indicated vol.
of 500 gal in Modes
5 and 6

DISCUSSION: This BAST volume for the RTS was provided by Westinghouse. The BAST volume compensates for RCS contraction and temperature induced reactivity due to cooldown from 200°F to ambient.

RTS 3.1.2.4.a.2

PARAMETER: BAST Boron Concentration, Modes 5 and 6

DOCUMENT/SECTION/VALUE:

RTS: 3.1.2.4.a.2 CTS: N/A

BAST boron con.
between 20,000
and 22,500 ppm

DISCUSSION: The BAST Boron Concentration in Modes 5 and 6 is identical to the CTS BAST Boron Concentration required by CTS 3.6.b.3 for Modes 1 and 2. The min and max values are used in the safety analysis for determining shutdown margin and to ensure solubility. The tech spec max and min values are consistent with the analysis values.

RTS 3.1.2.4.b.1

PARAMETER: RWST Volume, Modes 5 and 6

DOCUMENT/SECTION/VALUE:

RTS: 3.1.2.4.b.1 CTS: N/A

≥ 20,000 gal.

DISCUSSION: This RWST volume for the RTS was provided by Westinghouse. The RWST volume compensates for RCS contraction and temperature induced reactivity due to cooldown from 200°F to ambient.

RTS 3.1.2.4.b.2

PARAMETER: RWST Boron Con., Modes 5 and 6

DOCUMENT/SECTION/VALUE:

RTS: 3.1.2.4.b.2 CTS: N/A

≥ 1950 ppm

DISCUSSION: The RWST Boron Concentration in Modes 5 and 6 is identical to the CTS RWST Boron Concentration in CTS 3.6.b.3 for Modes 1 and 2.

[illegible]

RTS 3.1.2.5.b 3 & 4

PARAMETER: RWST Temp.

DOCUMENT/SECTION/VALUE:

RTS: 3.1.2.5.b.3 & 4 CTS: N/A

39°F - 100°F

DISCUSSION: These values are assumed in the containment integrity and large break LOCA analyses.

RTS 3.1.3.2

PARAMETER: Group demand position for Control Rods - (Operating)

DOCUMENT/SECTION/VALUE:

RTS: 3.1.3.2 CTS: N/A

± 2 steps

DISCUSSION: This is the accuracy of the setpoint for rod position upon an operator command. The basis for this tolerance is from the Westinghouse Vendor Manual, "Rod Position Indication System". The accuracy associated with the control band output voltage is ±1% of full scale voltage span. The integer of 1% full scale is ±2 steps.

RTS 3.1.3.3

PARAMETER: Group demand position for Control Rods - (Shutdown)

DOCUMENT/SECTION/VALUE:

RTS: 3.1.3.3 CTS: N/A

± 2 steps

DISCUSSION: This is the accuracy of the setpoint for rod position upon an operator command. The basis for this tolerance is from the Westinghouse Vendor Manual, "Rod Position Indication System". The accuracy associated with the control band output voltage is ±1% of full scale voltage span. The integer of 1% full scale is ±2 steps.

RTS 3.2.4

PARAMETER: Quadrant Power Tilt Ratio (QPTR)

DOCUMENT/SECTION/VALUE:

RTS: 3.2.4	CTS: 3.2.6.h
≤ 1.02	≤ 2%
> 1.02 and ≤ 1.09	> 2% and ≤ 10%
> 1.09	> 10%

DISCUSSION: The safety analysis for Turkey Point 3 & 4 assumes a QPTR of 2% or 1.02 at the start of a DBA. The RTS LCO and action statements are more conservative.

RTS 3.2.5

PARAMETER: DNB Limits: Tavg Pressurizer Pressure, RCS flow

DOCUMENT/SECTION/VALUE:

RTS: 3.2.5	CTS: 3.1.6
Tavg ≤ 576.6°F	Tavg ≤ 578.2°F
Pressurizer Pressure ≥ 2209 psig	Pressurizer Pressure ≥ 2220 psia
RCS flow ≥ 277,900 gpm	RCS flow ≥ 268,500 gpm

DISCUSSION: These values are more conservative than the CTS values. These values represent the allowable values with greater margin from the respective Safety Analysis limits. In STS Rev. 5, the DNB parameters are defined as indicated values, implying an allowance for instrument error. Westinghouse provided these numbers.

RTS Table 3.3-3

PARAMETER: Loss of Power - 480 Load Centers
Instantaneous Relays
Degraded Voltage

DOCUMENT/SECTION/VALUE:

RTS: Table 3.3-3	CTS: Table 3.5-4
3A 436V ± 5v (10 sec ± 1 sec delay)	3A 436V (10 sec delay)
3B 416V ± 5v (10 sec ± 1 sec delay)	3B 416V (10 sec delay)
3C 417V ± 5v (10 sec ± 1 sec delay)	3C 417V (10 sec delay)
3D 428V ± 5v (10 sec ± 1 sec delay)	3D 428V (10 sec delay)
4A 415V ± 5v (10 sec ± 1 sec delay)	4A 415V (10 sec delay)
4B 414V ± 5v (10 sec ± 1 sec delay)	4B 414V (10 sec delay)
4C 401V ± 5v (10 sec ± 1 sec delay)	4C 401V (10 sec delay)
4D 403V ± 5v (10 sec ± 1 sec delay)	4D 403V (10 sec delay)
	all with tolerance of ± 5v

DISCUSSION: The CTS calls out a 10 sec. delay. The RTS adds an explicit tolerance limit of ± 1 sec. to the 10 sec. delay. The repeat accuracy of the setting is 15%, therefore a tolerance of ± 1 sec. has been added as representative. The analytical requirements for these relays is a delay time of > 7 seconds and < 20 seconds.

RTS Table 3.3-3

PARAMETER: Control Room Air Intake Radiation Level

DOCUMENT/SECTION/VALUE:

RTS: Table 3.3-3   CTS: Table N/A

≤ 2 mR/hr (Setpoint)
≤ 2.83 mR/hr (Allowable)

DISCUSSION: This parameter is from the Radiation Monitoring Instrumentation Table in the STS. This value applies to Turkey Point and is the specified setpoint per the modification which installed this system. The allowable value is based on the measured instrument accuracy/drift.

[illegible]

RTS 3.3.3.1

PARAMETER: SFP Unit 3 High Gaseous

DOCUMENT/SECTION/VALUE:

RTS: Table 3.3-4 CTS: N/A

< 5.5×10^{-2}
uCi/cc

DISCUSSION: The SFP alarm setpoints were obtained from the ODCM (Off-Site Dose Calculation Manual).

RTS: 3.3.3.1

PARAMETER: SFP Unit 4 High Gaseous

DOCUMENT/SECTION/VALUE:

RTS: Table 3.3-4 CTS: N/A

< 2.8×10^{-2}
uCi/cc or
< 10^{6} cpm

DISCUSSION: The SFP alarm setpoints were obtained from the ODCM (Off-Site Dose Calculation Manual).

RTS 3.3.3.2

PARAMETER: # Detector Thimbles

DOCUMENT/SECTION/VALUE:

RTS: 3.3.3.2	CTS: 3.2.7
16 to calibrate Excore Neutron Flux and Monitor Quadrant Tilt Ratio, 2 per quadrant; 38 to monitor $FN_{\Delta}H$, $F_Q(Z)$, $F_{xy}(Z)$	16 thimbles, 2 per quadrant

DISCUSSION: The RTS requirement (38 operable thimbles) for F_Q and $FN_{\Delta}H$ surveillance is the generic STS limit (i.e., 75% of total thimbles) and is related to the generic F_Q and $FN_{\Delta}H$ surveillance uncertainty in Spec 3/4.2.2 and 3/4.2.3 (i.e., 5% on F_Q and 4% on $FN_{\Delta}H$). In the CTS, the same generic F_Q and $FN_{\Delta}H$ uncertainties apply with no corresponding thimble OPERABILITY requirement.

RTS 3.4.1.3

PARAMETER: Core Outlet Temp. Below Saturation (Mode 4)

DOCUMENT/SECTION/VALUE:

RTS: 3.4.1.3*	CTS: N/A
10°F below saturation	

DISCUSSION: This tech spec ensures that the primary coolant remains in the liquid phase. Any amount of subcooling will meet this requirement. 10°F is an STS value, which provides an allowance for instrument uncertainty. This is a generic Westinghouse value that is applicable to Turkey Point.

RTS 3.4.1.4.1*
3.4.1.4.2**

PARAMETER: Core Outlet Temp Below Saturation (Mode 5)

DOCUMENT/SECTION/VALUE:

RTS: 3.4.1.4.1* (loops filled) 3.4.1.4.2** (loops not filled)	CTS: N/A
$\geq$ 10°F below saturation	

DISCUSSION: This tech spec ensures that the primary coolant remains in the liquid phase. Any amount of subcooling will meet this requirement. 10°F is an STS value, which provides an allowance for instrument uncertainty. This is a generic Westinghouse value that is applicable to Turkey Point.

RTS 3.4.3

PARAMETER: Pressurizer Heater Capacity

DOCUMENT/SECTION/VALUE:

RTS: 3.4.3	CTS: 3.1.1.d
2 Groups, $\geq$ 125 KW each	1 group $\geq$ 125 KW if RCS $\geq$ 350°F.

DISCUSSION: The requirement for 2 groups is generic STS. 2 groups provides redundancy of function to improve system reliability relative to single failures and it is more restrictive than CTS.

RTS 3.5.1.d

PARAMETER: Accumulator Nitrogen Pressure

DOCUMENT/SECTION/VALUE:

RTS: 3.5.1.d 3.1.9-2	CTS: 3.4.1.a.3
600-675 psig	≥ 600 psig

DISCUSSION: The upper limit is based on the nitrogen cover gas pressure regulator. In an accident analysis, the minimum accumulator pressure is limiting. No accident analysis assumption is sensitive to the maximum pressure. The regulator setpoint prevents pressure from exceeding the FSAR design limit of 700 psig. The "normal" pressure listed in the FSAR is a nominal value, and has no safety significance within the RTS range of 600-675 psig.

The RTS limit on max. pressure is consistent with the generic STS format which includes minimum and maximum accumulator pressure values.

RTS 4.5.2.b.3

PARAMETER: RHR Pump Parameters

DOCUMENT/SECTION/VALUE:

RTS: 4.5.2.b.3	CTS: 4.5.2.a.2
Must meet Fig. 3.5-1 Pump Curve	Pumps shall start and reach required head for normal or recirc. flow, whichever is greater.

DISCUSSION: These values are from a safety evaluation performed per 10 CFR 50.59 to determine pump flows. The values for pump heads/flows were provided by Westinghouse and are acceptable with regard to the applicable accident analyses.

RTS 4.5.2.c.1

PARAMETER: SI Pump Parameters

DOCUMENT/SECTION/VALUE:

RTS: 4.5.2.c.1	CTS: 4.5.2.a.2
≥ 1126 psid @ ≥ 300 gpm normal alignment or ≥ 1156 psid @ ≥ 280 gpm	Pumps shall start and reach required head for normal or recirc. flow, whichever is greater.

DISCUSSION: These values are from FPL Calculation, "ECCS Pump Minimum Static Heads at Various Flows." The input values for pump head/flows were provided by Westinghouse and are based on flows (at various RCS pressures) assumed in the applicable accident analyses.

RTS 3.5.4.c & d

PARAMETER: RWST Temp.

DOCUMENT/SECTION/VALUE:

RTS: 3.5.4.c & d 6.2.11-2	CTS: N/A
≥ 39°F ≤ 100°	

DISCUSSION: These values are assumed in the containment integrity and large break LOCA analyses.

RTS 3.6.1.3

PARAMETER: Air Lock Leakage

DOCUMENT/SECTION/VALUE:

RTS: 3.6.1.3.b	CTS: 4.4.1& 4.4.2
≤ 0.05 La at Pa, 49.9 psig	Sum of local leak rate tests is ≤ 0.60 La

DISCUSSION: CTS 4.4.1 and 4.4.2 require only that the local leak rate tests is ≤ 0.60 La. The RTS value of 0.05 La is an STS value which will allow detection of gross failure of the airlock seal before the total containment leakage limit is exceeded.

RTS 3.6.1.5

PARAMETER: Containment Air Temp.

DOCUMENT/SECTION/VALUE:

RTS: 3.6.1.5	CTS: N/A
≤ 125°F; limited to 336 equivalent hrs/yr above 120°F	

DISCUSSION: The RTS value of 125°F is based on recent FPL analysis performed under the requirements of 10 CFR 50.59.

RTS 4.6.1.6.1a&b

PARAMETER: Containment Vessel Structural Integrity

DOCUMENT/SECTION/VALUE:

RTS: 4.6.1.6	CTS: 4.4.5
12 random tendons within lift-off limit; 240,000 psi for wire strand samples; Hoop 5 Vertical 4 Dome 3	9 select tendons Horizontal 3 Vertical 3 Dome 3

DISCUSSION: 240,000 psi is the minimum ultimate strength requirement specified in ASTM A421-65 which is the standard to which the prestressing wires were purchased. 12 tendons were proposed by FPL to comply with a proposed Reg. Guide. It is more conservative than the CTS requirement of 9 tendons.

RTS 4.6.1.7.2

PARAMETER: Purge Valves Leakage

DOCUMENT/SECTION/VALUE:

RTS: 4.6.1.7.2	CTS: N/A
≤ 0.05 La at Pa	

DISCUSSION: This limit is an STS generic limit. CTS 4.4.2 only requires that the sum of all local leak rate tests be ≤ 60% of the total allowable leakage (0.60 La at Pa).

RTS 4.6.2.1.b

PARAMETER: Containment Spray Pump Parameters

DOCUMENT/SECTION/VALUE:

RTS: 4.6.2.1.b	CTS: N/A
≥ 241.6 psid in recirc.	

DISCUSSION: These values are from a safety evaluation performed per 10 CFR 50.59 to determine pump flows. The values for pump heads/flows were provided by Westinghouse and are acceptable with regard to the applicable accident analyses.

RTS 4.6.3

PARAMETER: Emergency Containment Filters

DOCUMENT/SECTION/VALUE:

RTS: 4.6.3	CTS: 4.7.1.1 and 4.7.1.2.a
37,500 ± 10% CFM; pressure drop < 6" H_2O; ≥ 99% DOP removal, ≥ 99% halogenated hydrocarbon > 99.9% elemental iodine	37,500 ± 10% CFM pressure drop < 6" H_2O; ≥ 99% DOP removal, ≥ 99% halogenated hydrocarbon > 99.9% elemental iodine

DISCUSSION: RTS/CTS values are identical. FSAR removal values are reflective of design capabilities and not design bases requirements.

RTS 3.7.1.4

PARAMETER: Secondary Specific Activity

DOCUMENT/SECTION/VALUE:

RTS: 3.7.1.4	CTS: 3.8.2
≤ 0.10 uCi/gm Dose Equiv. I-131	≤ 0.67 uCi/gm Dose Equiv. I-131

DISCUSSION: The RTS value is an STS "generic" value, and is more restrictive than the CTS.

RTS 3.7.4

PARAMETER: Ultimate Heat Sink

DOCUMENT/SECTION/VALUE:

RTS: 3.7.4	CTS: N/A
average supply water temp. to ICWS ≤ 100°F	

DISCUSSION: 100°F in conjunction with CCW/ICW technical specification requirements for heat exchanger cleanliness, ensures capability to remove accident heat loads, as analyzed in a 10 CFR 50.59 evaluation.

RTS 4.7.8.1.3

PARAMETER: Fire Pump Diesel Starting Battery

DOCUMENT/SECTION/VALUE:

RTS: 4.7.8.1.3	CTS: N/A
Electrolyte level above plates. Battery voltage ≥ 24 volts	

DISCUSSION: Electrolyte level and voltage are STS criteria which ensure battery operability and are applicable to the Turkey Point equipment.

RTS 3.9.3

PARAMETER: Decay Time

DOCUMENT/SECTION/VALUE:

RTS: 3.9.3	CTS: 3.10.5
Reactor shall be subcritical for at least 100 hrs.	Reactor shall be subcritical for at least 100 hrs.

DISCUSSION: RTS/CTS values are identical. The FSAR value of 96 hours is the design time that shielding design is based on. The RTS/CTS duration is conservative with respect to this design value.

RTS 3.9.6

PARAMETER: Manipulator Crane Capacity

DOCUMENT/SECTION/VALUE:

RTS: 3.9.6 CTS: N/A

Capacity ≥
2750 lbs
cutoff limit ≤
2700 lbs.

DISCUSSION: These limits are STS values, and were provided by Westinghouse. They are applicable to Turkey Point because Turkey Point fuel assemblies are the same as those on which the STS values are based.

RTS 3.9.6

PARAMETER: Aux. hoist capacity

DOCUMENT/SECTION/VALUE:

RTS: 3.9.6 CTS: N/A

Capacity ≥
610 lb.
load indicator
> 600 lb.

DISCUSSION: These limits are STS values, and were provided by Westinghouse. They are applicable to Turkey Point because Turkey Point drive rods are the same as those on which the STS values are based.

RTS 4.9.8.1.1 & 4.9.8.2

PARAMETER: RHR flow

DOCUMENT/SECTION/VALUE:

RTS: 4.9.8.1.1 & 4.9.8.2	CTS: N/A
≥ 3000 gpm	

DISCUSSION: The 3000 gpm RHR flow is a generic STS limit, used in many Westinghouse STS plant specs. The safety analysis basis for the flow is to ensure uniform boron concentration within the RCS. The STS generic limit is applicable to Turkey Point based on the Turkey Point RHR system design flow rate.

The FSAR value represents the pump design flow, not a system requirement.

RTS 3.10.3

PARAMETER: Special Test: Power, Intermediate Range & Power Range Setpoints, RCS Lowest Loop Tavg

DOCUMENT/SECTION/VALUE:

RTS: 3.10.3	CTS: Several
≤ 5% RTP ≤ 25% RTP Trip Setpoint ≥ 531°	Example 3.2.1.a: "except for physics tests"

DISCUSSION: This TS allows suspension of various TS during low power physics tests as long as the listed parameters are maintained. The CTS physics test exceptions do not explicitly call out compliance with the listed parameters.

RTS 4.10.5

PARAMETER: Position Indication System - Special Test

DOCUMENT/SECTION/VALUE:

RTS: 4.10.5 CTS: N/A

12 steps-stationary
24 steps-during
motions

DISCUSSION: This is a generic STS surveillance to ensure position indication system operability during rod drop time measurements. The Rod Position Indication is calibrated to an accuracy of ± 5.0% of full scale rod withdrawal, which corresponds to the limit of ± 12 steps.

During calibration of the rod position indication, the distance between calibration points is approximately 24 steps. The case of a rod being in motion will correspond to the additional uncertainty in position between statically calibrated points. This additional uncertainty will be at its worst at the midpoint between any two such static points. This will add an additional ± 12 steps for a total of ± 24 steps for total uncertainty.

RTS 5.6.1.1.a & b

PARAMETER: d-K/K uncertainty in fuel racks

DOCUMENT/SECTION/VALUE:

RTS: 5.6.1.1.a & b CTS: N/A

Keff = ≤ 0.95
single region 2.55% d-k/k
Region 1: 0.97% d-k/k
Region 2: 1.96% d-k/k

DISCUSSION: The Region 1 and Region 2 dk/k uncertainties were provided by Westinghouse. This is historical design information used in the design of the fuel racks.

ATTACHMENT 5

MARKED UP SPECIFICATION PAGES

CONTAINMENT SYSTEMS

EMERGENCY CONTAINMENT COOLING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.2 Three emergency containment cooling units shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one of the above required emergency containment cooling units inoperable restore the inoperable cooling unit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two or more of the above required emergency containment cooling units inoperable, restore at least two cooling units to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore all of the above required cooling units to OPERABLE status within 72 hours of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 Each emergency containment cooling unit shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1) Starting each cooler unit from the control room and verifying that each unit motor reaches the nominal operating current for the test conditions and operates for at least 15 minutes, and

2) Verifying a cooling water flow rate of greater than or equal to 2000 gpm to each cooler.

b. At least once per 18 months by: i) verifying that each unit starts automatically on a safety injection (SI) test signal, and

FEB 28 1989

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CONTAINMENT VENTILATION SYSTEM (Continued)

resilient material seal degradation and will allow opportunity for repair before gross leakage failures could develop. The 0.60 L_a leakage limit of Specification 3.6.1.2b. shall not be exceeded when the leakage rates determined by the leakage integrity tests of these valves are added to the previously determined total for all valves and penetrations subject to Type B and C tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the Containment Spray System ensures that containment depressurization capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The allowable out-of-service time requirements for the Containment Spray System have been maintained consistent with that assigned other inoperable ESF equipment and do not reflect the additional redundancy in cooling capability provided by the Emergency Containment Cooling System. Pump performance requirements are obtained from the accidents analysis assumptions.

3/4.6.2.2 EMERGENCY CONTAINMENT COOLING SYSTEM

The OPERABILITY of the Emergency Containment Cooling System ensures that adequate heat removal capacity is available during post-LOCA conditions. The emergency containment coolers are a full capacity system and are redundant to the spray system in terms of heat removal function for design basis accident.

The allowable out-of-service time requirements for the Containment Cooling System have been maintained consistent with that assigned other inoperable ESF equipment and do not reflect the additional redundancy in cooling capability provided by the Containment Spray System.

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3/4.6.3 EMERGENCY CONTAINMENT FILTERING SYSTEM

The OPERABILITY of the Emergency Containment Filtering System ensures that sufficient iodine removal capability will be available in the event of a LOCA. The reduction in containment iodine inventory reduces the resulting SITE BOUNDARY radiation doses associated with containment leakage. The operation of this system and resultant iodine removal capacity are consistent with the assumptions used in the LOCA analyses. System components are not subject to rapid deterioration. Visual inspection and operating/performance tests after maintenance, prolonged operation, and at the required frequencies provide assurances of system reliability and will prevent system failure. Filter performance tests are conducted in accordance with the methodology and intent of ANSI N510- 1975.

MAY 0 5 1989

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The surveillance requirement for ECC flow is verified by correlating the test configuration value with the design basis assumptions for system configuration and flow. An 18-month surveillance interval is acceptable based on the use of water from the CCW system, which results in a low risk of heat exchanger tube fouling.

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3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent Containment Spray Systems shall be OPERABLE with each Spray System capable of taking suction from the RWST and manually transferring suction to the Containment sump via the RHR system.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one Containment Spray System inoperable restore the inoperable Spray System to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two Containment Spray Systems inoperable restore at least one Spray System to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both Spray Systems to OPERABLE status within 72 hours of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each Containment Spray System shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position and that power is available to flow path components that require power for operation;

b. By verifying that on recirculation flow, each pump develops the indicated differential pressure, when tested pursuant to Specification 4.0.5:

Containment Spray Pump $\geq$241.6 psid while aligned in recirculation mode.

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TABLE 3.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

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

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE#
1. Safety Injection (Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room Ventilation Isolation, Start Diesel Generators, Containment Phase A Isolation (except manual SI), Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)		
a. Manual Initiation	N.A.	N.A.
-- b. Automatic Actuation Logic	N.A.	N.A.
c. Containment Pressure--High	≤6 psig	≤[ ] psig
d. Pressurizer Pressure--Low	≥1715 psig	≥[ ] psig
e. High Differential Pressure Between the Steam Line Header and any Steam Line.	≤150 psi	≤[ ] psi
f. Steam Line Flow--High	≤A function defined as follows: A Δp corresponding to 0.64×10^6 lbs/hr at 0% load increaing linearly to a Δp corresponding to 3.84×10^6 lbs/hr at full load.	[ ]
Coincident with: Steam Generator Pressure--Low	≥600 psig	≥[ ] psig
or T_{avg}--Low	≥531°F	≥[ ]°F
2. Containment Spray		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Containment Pressure--High-High Coincident with:	≤30.0 psig	≤[ ] psig
Containment Pressure--High	≤6.0 psig	≤[ ] psig

FEB 28 1989

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4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST#	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Safety Injection (Reactor Trip, Turbine Trip, Feedwater Isolation, Control Room [Ventilation] Isolation, Start Diesel Generators, [Containment Phase A Isolation (except manual SI)] Containment Cooling Fans, Containment Filter Fans, Start Sequencer, Component Cooling Water, Start Auxiliary Feedwater and Intake Cooling Water)						
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	1, 2, 3(~~4~~ 3)
c. Containment Pressure--High	N.A.	R	N.A.	~~9 N~~ N.A.	M(1)	1, 2, 3
d. Pressurizer Pressure--Low	S	R	M(~~6~~ 5)	N.A.	N.A.	1, 2, 3(~~4~~ 3)
e. High Differential Pressure Between the Steam Line Header and any Steam Line	S	R	M(~~6~~ 5)	N.A.	N.A.	1, 2, 3(~~4~~ 3)
f. Steam Line Flow--High Coincident with:	S	R	M(~~6~~ 5)	N.A.	N.A.	1, 2, 3(~~4~~ 3)
Steam Generator Pressure--Low	S	R	M(~~6~~ 5)	N.A.	N.A.	1, 2, 3(~~4~~ 3)
or						
T_{avg}--Low	S	R	M(~~6~~ 5)	N.A.	N.A.	1, 2, 3(~~4~~ 3)