50-302

DOCUMENT TRANSMITTAL FORM 83273

FOR DOCUMENTS TRANSMITTED TO DC DESK (NRC)*

DATE: 16 DEC 1992
BATCH: 100

DOCUMENT NUMBER	SHEET NUMBER	REVISION NUMBER	COPY NUMBER
AR 958		04	24
VP 580		20	20

INSTRUCTIONS TO THE ADDRESSEE

COMPLETE EACH OF THE INSTRUCTIONS BELOW WHICH ARE MARKED WITH AN " x "

_X_ (1) VERIFY THE DOCUMENTS RECEIVED AGREE WITH THE ABOVE DESCRIPTION
_X_ (2) INCORPORATE THE TRANSMITTED DOCUMENTS INTO YOUR FILES
_X_ (3) DESTROY DOCUMENTS OR PORTIONS OF DOCUMENTS SUPERSEDED BY THE ABOVE
_X_ (4) SIGN AND DATE IN THE SPACES BELOW INDICATING THAT YOU COMPLETED THESE INSTRUCTIONS.
___ (5) SIGN BELOW INDICATING THAT YOU HAVE READ AND UNDERSTOOD THE CHANGES AS IDENTIFIED
_X_ (6) RETURN TO DOCUMENT CONTROL, CRYSTAL RIVER UNIT 3, MAC# NA1C___
NR2A_X_ SA1G___ FLORIDA POWER CORP., P.O. BOX 219
CRYSTAL RIVER FLA 34423-0219
___ (7) QUALITY PROGRAMS PERSONNEL HAVE READ AND UNDERSTOOD THE CHANGES TO THE AFFECTED QAP'S

SIGNATURE OF ADDRESSEE _____ DATE _____

INDEPENDENT VERIFICATION _____ DATE _____ (OPS)

080028

A045
0/1

PLANT SAFETY VERIFICATION PROCEDURE

This Procedure Addresses Safety Related Components

Approved by NSS [signature] Date 12-16-92

1.0 REACTIVITY CONTROL

ACTIONS	DETAILS
1.1 IF Rx tripped, THEN verify Immediate Actions of AP-580, Rx Trip, are completed.	o CRD Groups 1 thru 7 are fully inserted. o Intermediate range flux decreasing or source range detectors energized and decreasing. o TVs or GVs closed. o "MAIN FW BLOCK"s closed. o "LO LOAD FW BLOCK"s closed. o PZR level ≥ 50 inches. o Steam Hdr PRESS ≈ 1010 psig. o Output Bkrs open. o Verify ICS and NNI power is available.

Note

NI-14-NI1 and NI-15-NI1, neutron flux monitors may not be reliable under accident conditions, due to cable assemblies possibly leaking.

1.2 IF Neutron flux is NOT decreasing, THEN verify Emergency Boration	o Refer to EP-140, Emergency Reactivity Control.

1.0 REACTIVITY CONTROL (CONT'D)

ACTIONS	DETAILS
1.3 IF >1 control rod NOT fully inserted, THEN verify Emergency Boration	o IF > 1 control rod is stuck THEN continue boration until either of the following: o Actual boron concentration ≥ 1925 ppmb OR o Actual boron concentration ≥ value determined by the Reactor Engineer
1.4 IF Rx is NOT tripped, THEN observe plant parameters AND determine if Rx should be tripped.	o Limiting Safety System Setting exceeded. o 2 or more MSIVs are closed. o All MFW is lost ≥ 15% FP. o PZR level ≥ 290 inches. o PZR level cannot be maintained > 100 inches during SGTR with HPI. o SWT-1 < 1 ft. and level cannot be restored. o SW flow is lost and cannot be restored. o 2 or more CRDM stator TEMPs ≥ 180° F
1.5 Verify 480V Bkrs are closed: o Bkr 3305 o Bkr 3312	

2.0 THERMAL CONTROL

ACTIONS	DETAILS

2.1 Verify RCS heat production is balanced to OTSG heat removal.	o SPDS indicates stable temp & press. and parameters are within the post trip box.
	o IF NOT, THEN determine cause of mismatch and make appropriate recommendations.
	o IF unexplained and significant RC pressure decrease exists, THEN ensure proper operation:
	  o RCV-10, PORV
	  o RCV-14, PZR Spray Valve
	  o PZR Heaters
	o IF SPDS is NOT operable, THEN record RCS PRESS and TEMP on Enclosure 1 until plant is stable for ≈ 30 min.

Note

Due to possible high radiation conditions, Th and Tc indications may become unreliable 24 hrs after a LOCA.

2.2 IF RCP's are NOT operating, THEN verify Nat Circ. exists or is developing. IF Nat Circ is NOT verified AND adequate subcooling margin exists, THEN refer to AP-530, Natural Circulation.	Indications of Nat Circ: o Verify Tc ≈ Tsat of OTSG. o Verify core ΔT develops and stabilizes. o Verify incore TEMPs follows Th within 10° F. o WHEN OTSG PRESS is lowered, THEN verify Tc, incore TEMPs, and Th lower.

ACTIONS | DETAILS

Note

Enclosure 2 contains EFW inventory requirements during a loss of offsite power cooldown to DHR.

2.3 IF Nat Circ exists, THEN verify proper Nat Circ coo'down rate.

Nat Circ Cooldown Rates

RCS Tc	°F/hr
> 280°F	≤ 10°F
280 to 150°F	≤ 5°F
< 150°	≤ 2.5°F
*	≤ 50°F

* Only to be used if RCS PRESS is maintained above Nat Circ cooldown curve.

2.4 IF Adequate subcooling margin does NOT exist, THEN verify:

- o Full HPI or LPI flow,
- o No RCPs operating,
- o OTSGs at 95%

Tsat Monitor
Adequate Subcooling Margin

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

- o Refer to AP-380, ES Actuation.
- o Refer to AP-360, Loss of DHR.

2.0 THERMAL CONTROL (CONT'D)

ACTIONS	DETAILS
2.5 IF HPI actuated, THEN verify HPI flows balanced and MUV-27 closed.	
2.6 IF RCS PRESS is > 2400 psig, THEN verify PORV OR high point vents are used to reduce RCS PRESS.	Refer to SPDS AND abnormal or emergency operating procedures in use to determine RCS PRESS limits.
2.7 IF RCS pressure is ≤ 200 psig AND adequate subcooling margin does not exist THEN verify boron precipitation actions are complete within 24 hours of the event.	OP-404, Decay Heat Removal System, Section 4.13, Long-Term Post-Accident Cooling.
2.8 IF any of the following conditions exist: ○ RCPs NOT operating, AND HPI flow exists through any nozzle while RCS TEMP is < 500°F. ○ STS cooldown rate limits exceeded while RCS TEMP is < 380°F. THEN verify EP-220, PTS, is being performed.	STS cooldown rate limits:

RCS TEMP °F	RATE LIMIT
> 280	≤ 50° ½ hr
280 to 151	≤ 25° ½ hr
≤ 150	≤ 10°F/hr

2.0 THERMAL CONTROL (CONT'D)

ACTIONS	DETAILS

2.9 IF Subcooling Margin is > 100°F, THEN verify operation in accordance with abnormal and emergency operating procedure in use:

- o HPI,LPI
- o MFW, EFW, EFIC
- o OTSG PRESS and level

2.10 Verify required OTSG level.

Required OTSG levels

Condition	Level
Inadequate subcooling margin	80%-90%
NO RCPs and adequate subcooling margin	60%-70%
RCPs and adequate subcooling margin	Low Level Limits

IF OTSG Tube leak exists, AND adequate subcooling margin does NOT exist, AND ≥ 2 HPI pumps are available, THEN verify affected OTSG is NOT being fed.

2.11 IF EFW and MFW are NOT available, THEN verify HPI\PORV cooling.

2.12 IF OTSG Tube Rupture has occurred, THEN verify proper cooldown rate.

Refer to EP-390, OTSG Tube Leak.

ACTIONS	DETAILS
2.13 IF incores indicate superheated conditions, THEN verify EP-290, Inadequate Core Cooling, is being performed AND monitor RCS inventory.	Instrumentation for monitoring RCS inventory: o Reactor Coolant Inventory Tracking System - will be affected by HPI, LPI, or Natural Circulation flow. o Reactor Coolant Pump Void Trend Monitoring System is effective only when RCPs are operating.

3.0 RADIOACTIVE INVENTORY CONTROL

ACTIONS	DETAILS
3.1 Observe radiation monitors for unexplained trends.	IF any monitor is indicating, an unexplained upward trend THEN advise SSOD of trend OR IF any monitor is in alarm, THEN refer to AP-250, Radiation Monitor actuation.
3.2 Observe MS radiation monitors and RMA-12 for unexplained trends.	IF any MS radiation monitor or RMA-12 indicates OTSG leakage, THEN refer to EP-390, Steam Generator Tube Leak.
3.3 Observe for increased RCS leakage.	o Observe: o RCP seals and dumpsters, o PZR level, o RCDT level, o MUT level, o ho sump level, o Relief valve tailpipe TEMPS. o Refer to STS 3.4.6.2, Operational Leakage.
3.4 Verify fuel integrity.	Observe RML-1 Alarms and trends.

4.0 EQUIPMENT AVAILABILITY

ACTIONS	DETAILS
4.1 Verify availability of borated water sources for HPI/LPI pumps. IF NOT, THEN REFER TO: o If in Modes 1, 2 or 3, AP-380, ES Actuation, o If in Modes 4, 5 or 6, AP-360, Loss of DHR.	o MUT level o BWST level
4.2 Verify availability of HPI, LPI and BS pumps.	o Cooling water - SW,RW,DC o Max flow for HPI pump 540 gpm o Min flow for HPI pump with recirc valve closed 100 gpm. o With suction from RB sump limit LPI flow to ≈ 2000 gpm & BS flow to ≈ 1200 gpm per train.
4.3 Verify water sources for OTSG cooling.	o EF Tank level ≥ 15 ft. o CST level ≥ 5 ft. o Hotwell level at 7 to 9 ft. - 84 to 109 inches. o See Enclosure 2 for EFW requirements. o See Enclosure 3 for other sources of water.
4.4 IF RCS PRESS < 600 psig AND adequate subcooling margin does NOT exist, THEN verify CFTs not isolated.	

4.0 EQUIPMENT AVAILABILITY (CONT'D)

ACTIONS	DETAILS
4.5 Verify SW and RW available and SW cooling to the RCP's. IF NOT, THEN ENSURE AP-330, LOSS of SW, is being performed.	o SW PRESS ≥ 110 psig. o Stable SW & RW Motor Current.
4.6 Verify DC Cooling, if required. IF NOT, THEN ensure AP-360, Loss of DH, is being performed.	o Stable DCP motor current and discharge PRESS. o DC Heat Exchanger Outlet TEMP < 105 F.
4.7 Verify ES busses energized & Instrumentation power available.	o ES 4160V "A" & "B". o ES 480V "A" & "B". o ICS, NNI-X and NNI-Y.
4.8 IF offsite power is NOT available, AND offsite power will NOT be restored within 2 hours, THEN verify EDG operation is within fuel oil consumption limits and fuel oil reserves are adequate.	IF within 2 hours offsite power has NOT been restored, AND 2 EDGs are running THEN notify the SSOD to: o Order additional fuel oil for emergency delivery within next 10 hours. o Reduce and maintain combined EDG loads to ≤ 2330 KW within next 10 hours.
4.9 Verify Instrument Air pressure available.	IA & SA Low pressure alarms at ≤ 85 psig. o SA-4-PI o IA-4-PI

ACTIONS	DETAILS
4.10 Verify EFW available.	o EFW is required when: o MFW not available or o No RCPs operating or o Adequate SCM does not exist
4.11 Evaluate RB temp. & press. AND inform SSOD of any abnormalities.	o Strip charts located on back of main control board.
4.12 WHEN VP-580 is stopped, THEN notify SSOD.	

Note

Enclosures 4 through 7 are flow diagrams which provide an overview of symptom oriented transients:

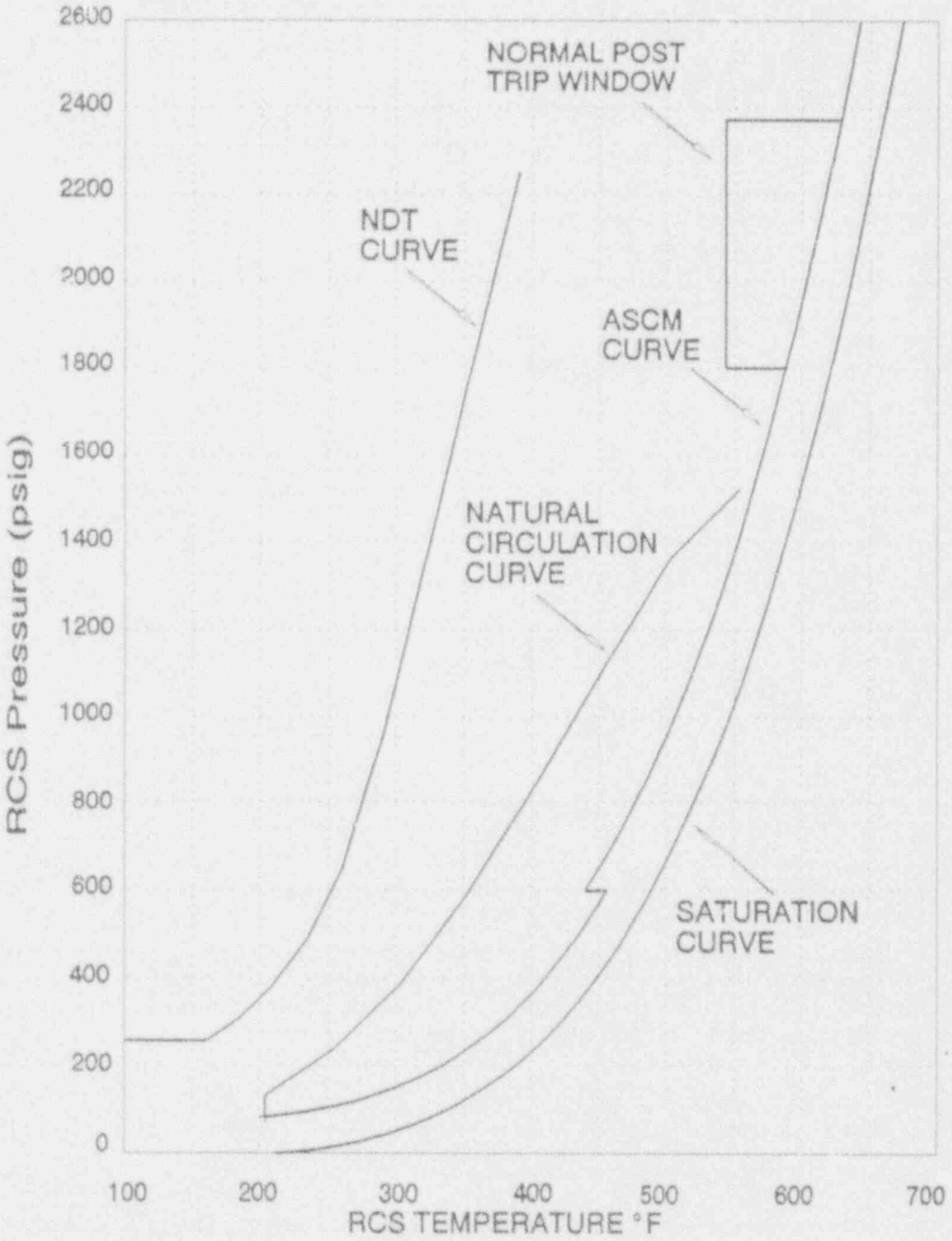
- o Enclosure 4 - LOSS OF SUBCOOLING MARGIN
- o Enclosure 5 - INADEQUATE CORE COOLING
- o Enclosure 6 - EXCESSIVE HEAT TRANSFER
- o Enclosure 7 - STEAM GENERATOR TUBE RUPTURE

Note

When the plant has been placed in a stable safe condition then review Emergency Plan Classifications and NRC reporting requirements. Perform AI-704 as time permits.

ENCLOSURE 1

Cooldown Curve for Natural Circulation and Forced Flow



Acceptable region is:

- o below and to the right of the NDT curve
- o above and to the left of the ASCM curve
- o above and to the left of the Natural Circulation curve if RCPs are off and cooldown rate $\geq 10^{\circ}F/hr$

ENCLOSURE 2

Cooldown Requirements Vs. Nat Circ Cooldown Rates

1) FW requirements and the time to cooldown are controlled primarily by the characteristics of the ADVs and the cut-in conditions for the DHR system.

2) The time to cooldown from Rx trip is about 150 hrs.

3) The FW requirement to cooldown is about 735,000 gal.

4) The minimum cooldown rate consistent with the above minimum time and FW requirements is about 8.5°F/hr.

5) Cooldown rates in excess of 8.5°F/hr do not decrease the FW or time requirements for cooldown.

6) Cooldown rates less than 8.5°F/hr increase both the FW and the time requirements for cooldown.

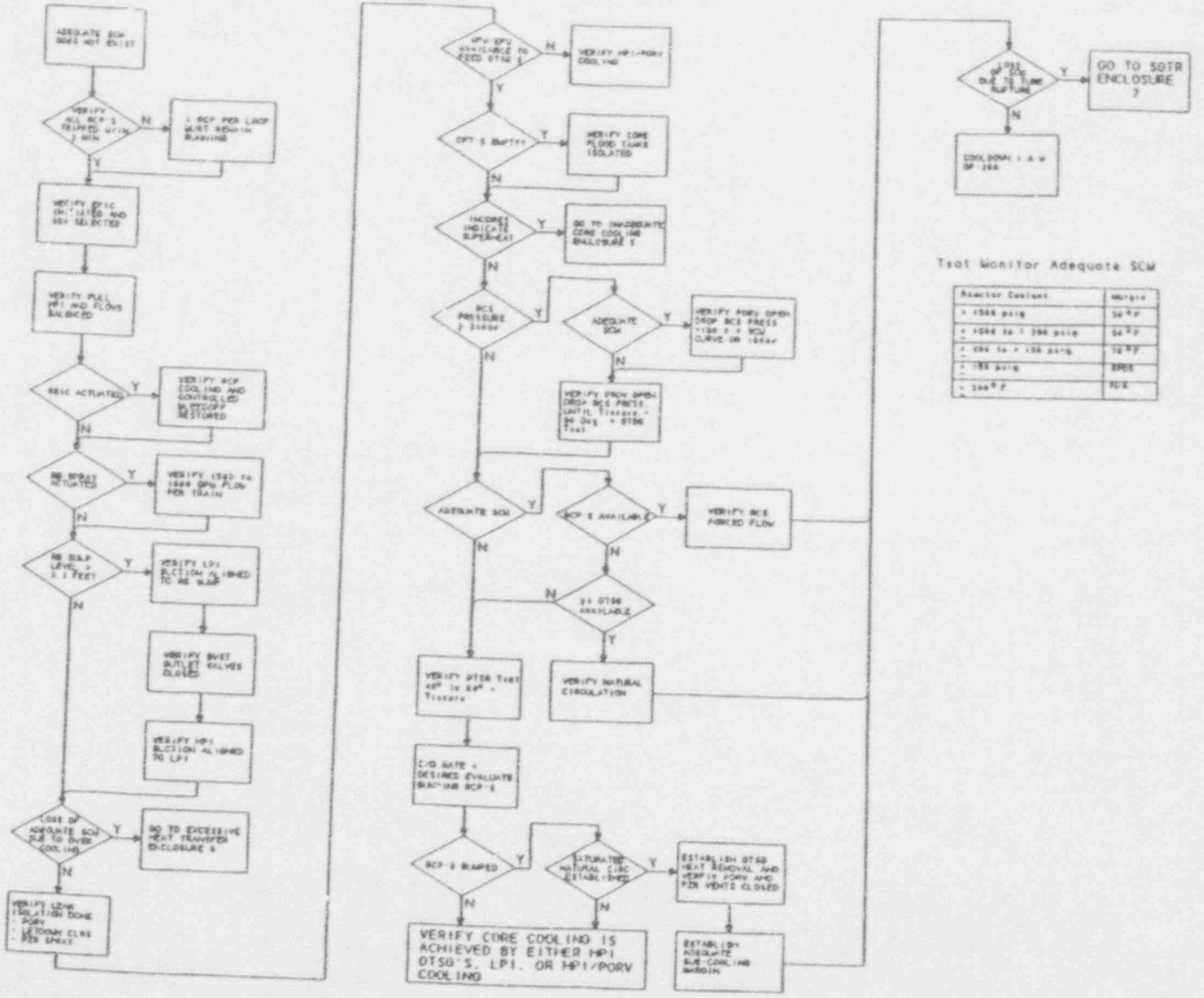
7) A time delay of 28 hours from Rx trip will not significantly affect FW or time requirements if a cooldown rate of 50°F/hr is then utilized. For smaller time delays smaller cooldown rates may be utilized.

Sources of Emergency Feedwater (EFW) at the Crystal River Site

Condensate - Grade Sources

Source	Volume (gal)
Dedicated EFW Tank (EFT-2)	150,000
Condensate Storage Tank	139,000
Condenser Hotwells	150,000
DW Storage Tank, Unit 3	450,000
DW Storage Tank, Unit 1	147,000
DW Storage Tank, Unit 2	147,000
DW Storage Tank, Unit 4/5	500,000
CD Storage Tank, Unit 4	500,000
CD Storage Tank, Unit 5	500,000
AB DW Storage Tank, Unit 3	5,000

Loss of Subcooling Margin

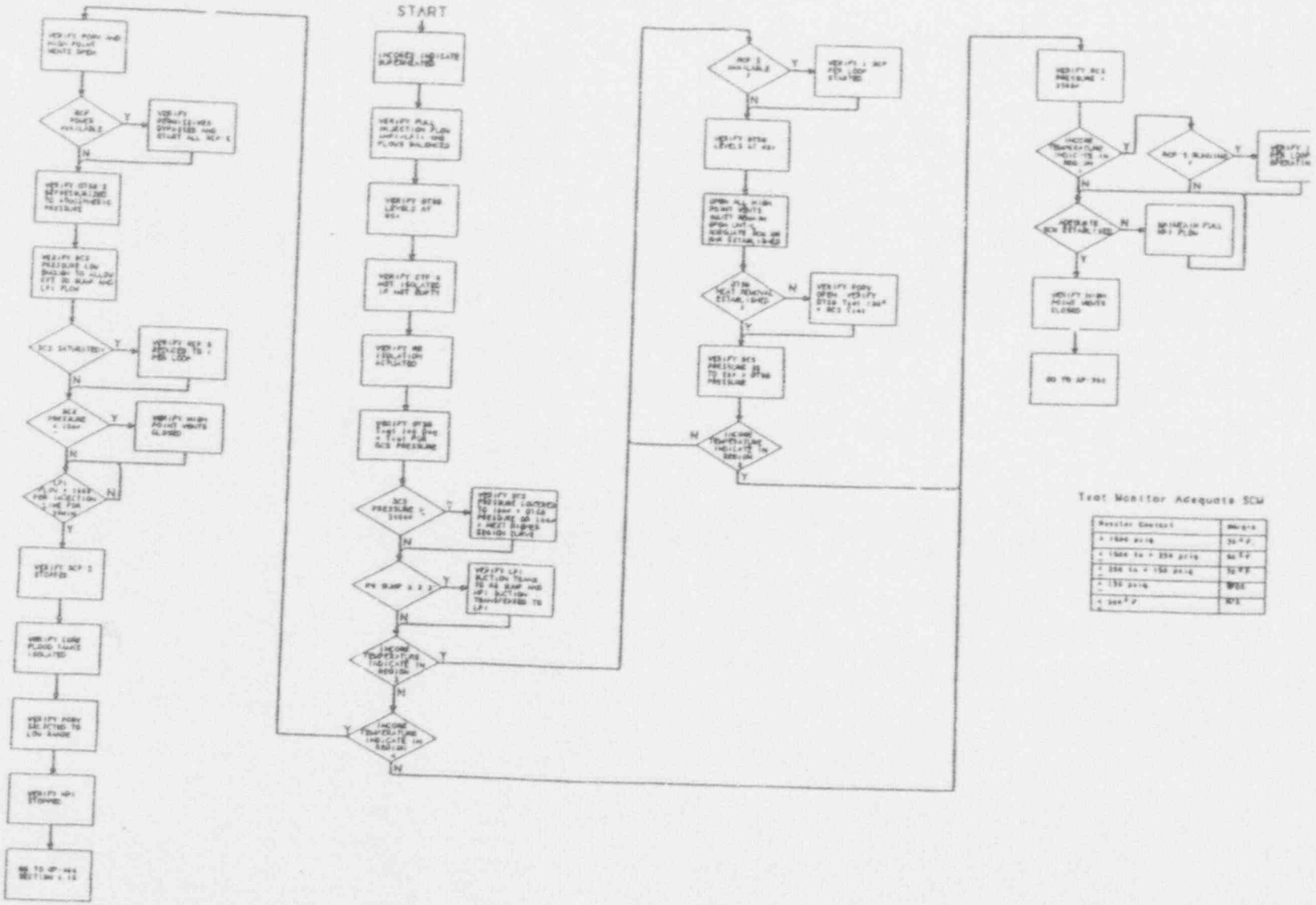


Tsat Monitor Adequate SCM

Reactor Coolant	Margin
> 1500 psig	50°F
< 1500 to > 300 psig	50°F
< 300 to > 100 psig	10°F
< 100 psig	ERROR
< 200°F	N/A

ENCLOSURE 5

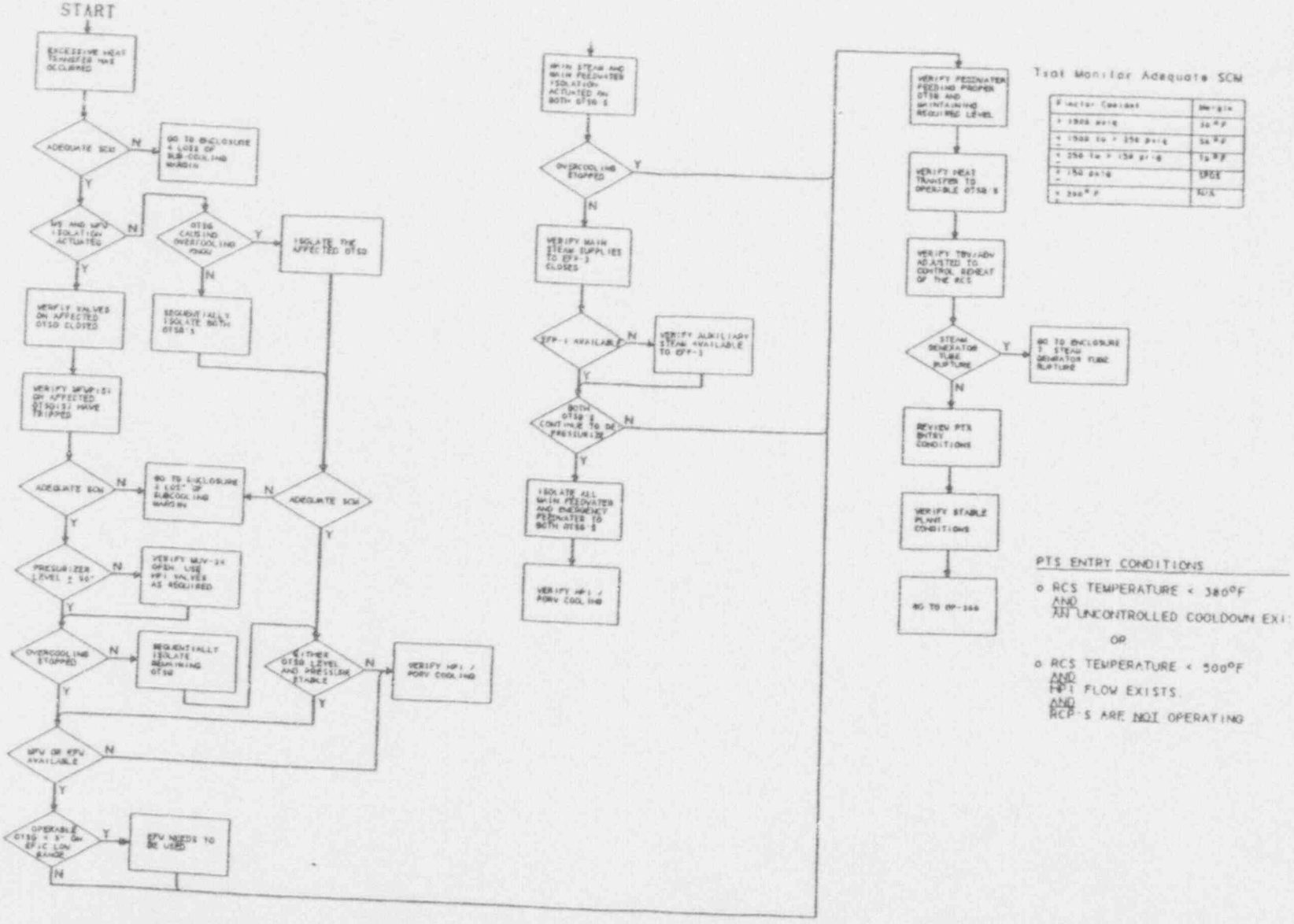
Inadequate Core Cooling



Text Monitor Adequate SCM

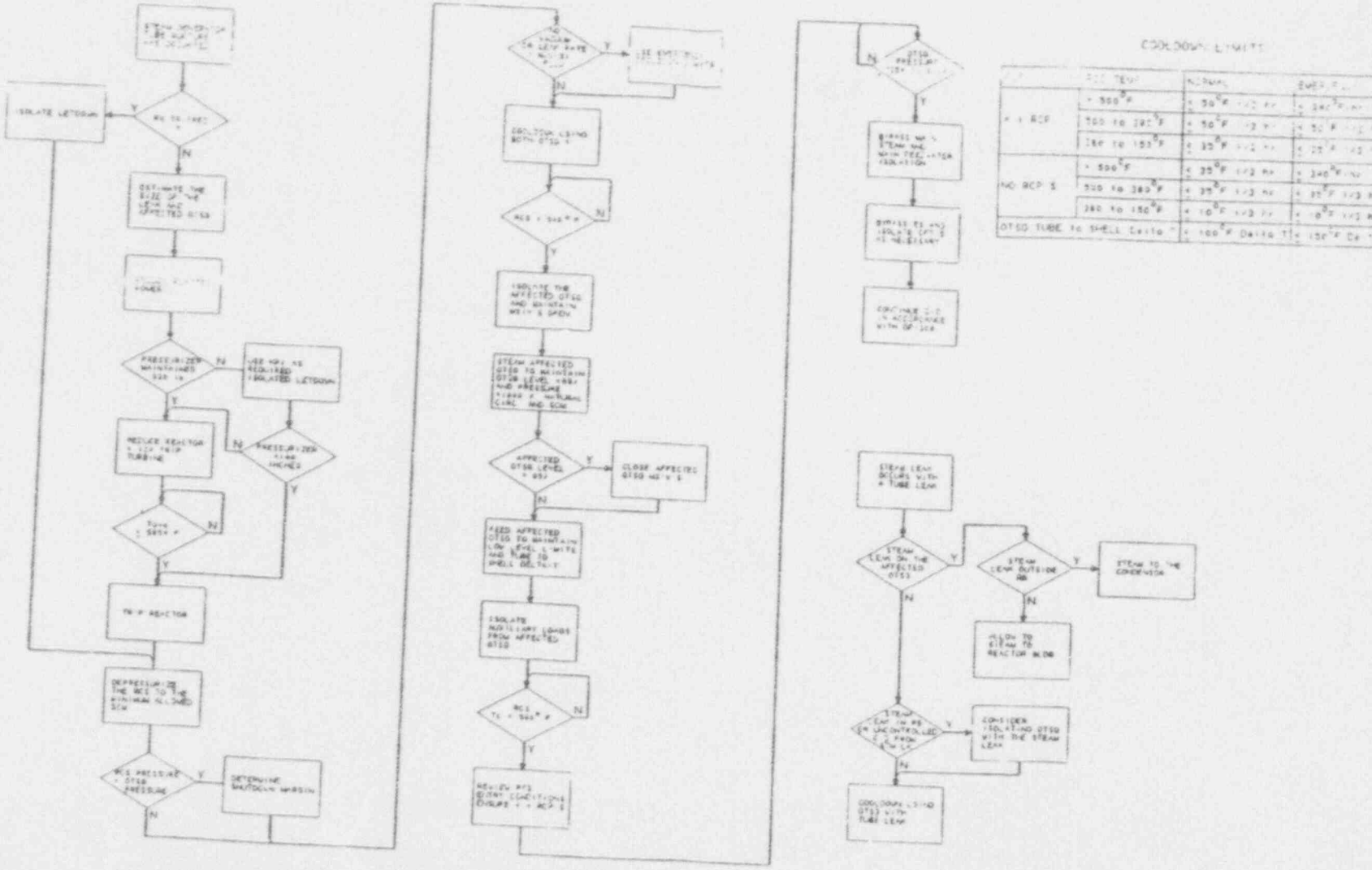
Monitor Content	Weight
> 1500 psig	32 F
< 1500 to > 250 psig	64 F
< 250 to > 150 psig	32 F
< 150 psig	8 F
< 300 F	8 F

Excessive Heat Transfer



ENCLOSURE 7

Steam Generator Tube Rupture



VP-580	REV 20	PAGE 19 of 19	PSVP

Rev. 4 12/09/92

Effective Date 12/16/92

ANNUNCIATOR RESPONSE

AR-958

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

WDH ANNUNCIATOR RESPONSE

THIS PROCEDURE ADDRESSES SAFETY RELATED COMPONENTS

APPROVED BY: Interpretation Contact

W. Marshall

DATE: 12/15/92

Interpretation Contact: Manager, Nuclear Plant Operations

TABLE OF CONTENTS

SECTION			PAGE
1.0	PURPOSE		1
2.0	REFERENCES		1
	2.1	IMPLEMENTING REFERENCES	1
	2.2	DEVELOPMENTAL REFERENCES	1
3.0	PERSONNEL INDOCTRINATION		1
4.0	INSTRUCTIONS		1
5.0	FOLLOW-UP ACTIONS		1

ENCLOSURE

1	Annunciator Response	2

1.0 PURPOSE

1.1 Establish a reference document for each Annunciator Window on the WD-WV Panel Lampbox.

1.2 Establish operator actions for valid Annunciator alarms on the WD-WV Panel Lampbox.

1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the WD-WV Panel Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

None

2.2 DEVELOPMENTAL REFERENCES

2.2.1 INPO 90-021, Good Practice OP-217, Alarm Response Procedures.

2.2.2 Annunciator Window Engraving Drawing E-224-050.

3.0 PERSONNEL INDOCTRINATION

None

4.0 INSTRUCTIONS

4.1 Respond to alarms on the WD-WV Panel Lampbox as indicated on Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP ACTIONS

None

ANNUNCIATOR PANEL LOCATION RADWASTE DISPOSAL CUBICLE | ANNUNCIATOR PANEL WD-WV (H) | HORIZONTAL ROW 1

WINDOW TITLE	1. INDICATED CONDITION 2. CONTROL ROOM OR AUXILIARY BUILDING INDICATION WHICH VERIFY OR PINPOINT TROUBLE	1. AUTO ACTION 2. OPERATOR ACTION - VALID ALARM	SETPOINT	SENSING ELEMENT NUMBER & LOCATION	REFERENCE
EVAP CDSTE DEMIN "A" HIGH TEMP WV-1-1	1. a) Evap CDSTE demin "A" temp > 120°F. 2. a) Evap CDSTE demin "A" temp indicator on WD panel.	1. a) None. 2. a) Stop flow to demineralizer. b) Determine cause of high temperature and correct.		WD-91-TS	WD-141
EVAP CDSTE DEMIN "B" HIGH TEMP WV-1-2	1. a) Evap CDSTE demin "B" temp > 120°F. 2. a) Evap CDSTE demin "B" temp indicator on WD panel.	1. a) None. 2. a) Stop flow to demineralizer. b) Determine cause of high temperature and correct.		WD-92-TS	WD-141
EVAP CDSTE DEMIN "A" HIGH DIFF PRESS WV-1-3	1. a) Evap CDSTE demin "A" diff press > 40 psid. 2. a) Evap CDSTE demin "A" diff press indicator on WD panel.	1. a) None. 2. a) Sluice resin out and replace.		WD-211-PS	WD-141
EVAP CDSTE DEMIN "B" HIGH DIFF PRESS WV-1-4	1. a) Evap CDSTE demin "B" diff press > 40 psid. 2. a) Evap CDSTE demin "B" diff press indicator on WD panel.	1. a) None. 2. a) Sluice resin out and replace.		WD-212-PS	WD-141
EVAP CDSTE STOR TANK "A" HIGH LEVEL WV-1-5	1. a) Evap CDSTE storage tank "A" level > 97.6%. 2. a) Evap CDSTE storage tank "A" level indicator on WD panel.	1. a) None. 2. a) Open tank drain to maintain level. b) Determine cause of high level and correct.		WD-97-LS1	WD-141
EVAP CDSTE STOR TANK "A" LOW LEVEL WV-1-6	1. a) Evap CDSTE storage tank "A" level < 21.4%. 2. a) Evap CDSTE storage tank "A" level indicator on WD panel.	1. a) None. 2. a) Stop evap cond. pump 3A. b) Determine cause of low level and correct.		WD-97-LS2	WD-141
EVAP CDSTE STOR TANK "B" HIGH LEVEL WV-1-7	1. a) Evap CDSTE storage tank "B" level > 97.6%. 2. a) Evap CDSTE storage tank "B" level indicator on WD panel.	1. a) None. 2. a) Open tank drain to maintain level. b) Determine cause of high level and correct.		WD-98-LS1	WD-141
EVAP CDSTE STOR TANK "B" LOW LEVEL WV-1-8	1. a) Evap CDSTE storage tank "B" level < 21.4%. 2. a) Evap CDSTE storage tank "B" level indicator on WD panel.	1. a) None 2. a) Stop evap cond. pump 3B. b) Determine cause of low level and correct.		WD-98-LS2	WD-141

ANNUNCIATOR PANEL LOCATION RADWASTE DISPOSAL CUBICLE ANNUNCIATOR PANEL WD-WV (H) HORIZONTAL ROW 2

WINDOW TITLE	1. INDICATED CONDITION 2. CONTROL ROOM OR AUXILIARY BUILDING INDICATION WHICH VERIFY OR PINPOINT TROUBLE	1. AUTO ACTION 2. OPERATOR ACTION - VALID ALARM	SETPOINT	SENSING ELEMENT NUMBER & LOCATION	REFERENCE
WASTE GAS SURGE TANK HIGH DIFF PRESS WV-2-1	1. a) Waste gas surge tank diff press > 2.0 PSIG. 2. a) Local indicator.	1. a) None. 2. a) Check valve lineup, determine cause and correct.		WD-203-PS3	WD-141
WASTE GAS COMPRESSOR 3B HIGH TEMP WV-2-2	1. a) Waste gas compressor 3B outlet gas temperature > 150°F. 2. a) WDP-1B temperature indicator on WD panel.	1. a) None. 2. a) Check SW cooling water to compressor. b) Transfer to 3A compressor.		WD-152-TS	WD-141
WASTE GAS COMPRESSOR 3A HIGH TEMP WV-2-3	1. a) Waste gas compressor 3A outlet gas temperature > 150°F. 2. a) WDP-1A temperature indicator on WD panel.	1. a) None. 2. a) Check SW cooling water to compressor. b) Transfer to 3B compressor.		WD-153-TS	WD-141
CATION DEMIN "A" & "B" STRAIN HIGH D/P WV-2-4	1. a) Cation demin "A" & "B" outlet strainer differential pressure > 5 psid. 2. a) Local indicator.	1. a) None. 2. a) Flush strainer to spent resin storage tank.		WD-228-PS WD-229-PS	WD-141
DRAIN POT HIGH LEVEL WV-2-5	1. a) Waste Gas Surge Tank Drain pot level >18" H_2O. 2. a) Local level indication at the drain pot.	1. a) None. 2. a) Open drain valve for drain pot to maintain proper level. b) Determine cause of high level and correct.		WD-3-LS	WD-141
DEBOR DEMIN HIGH INLET TEMP WV-2-6	1. a) Debor demin inlet header temperature > 120°F. 2. a) Demin 1A/1B T-inlet temperature indicator on WD panel.	1. a) None. 2. a) Secure flow to demineralizer. b) Determine cause of high temperature and correct.		WD-45-TS	WD-141
DEBOR DEMIN "A" HIGH DIFF PRESS WV-2-7	1. a) Debor demin 3A differential pressure > 40 psid. 2. a) Debor demin 3A D/P indicator on WD panel indicates that demin is filled solid (3.25 psid).	1. a) None. 2. a) Sluice resin and replace.		WD-207-PS1	WD-141
DEBOR DEMIN "B" HIGH DIFF PRESS WV-2-8	1. a) Debor demin 3B differential pressure > 40 psid. 2. a) Debor demin 3B D/P indicator on WD panel indicates that demin is filled solid (3.25 psid).	1. a) None 2. a) Sluice resin and replace.		WD-208-PS1	WD-141