INFORMATION ONLY

Holder # 1242

ANNUNCIATOR RESPONSE

AR-304

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

ESD ANNUNCIATOR RESPONSE

APPROVED BY: Procedure Owner

(SIGNATURE ON FILE)

DATE:

9/29/98

PROCEDURE OWNER: Manager, Nuclear Plant Operations

Support

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1.0 PURPOSE

- 1.1 Establish a reference document for each Annunciator Window on the ES (B)-JH1 Lampbox.
- 1.2 Establish operator actions for valid Annunciator alarms on the ES (B)-JH1 Lampbox.
- 1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the ES(B)-JH1 Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

- 2.1.1 EOP, Emergency Operating Procedure
- 2.1.2 OP-404, Decay Heat Removal System
- 2.1.3 OP-703, Plant Distribution System
- 2.1.4 AP-880, Fire Protection

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-224-048
- 2.2.3 PT-169B, Decay Heat Removal/Building Spray Instrumentation Train "B"
- 2.2.4 SP-132, Engineered Safeguards Channel Calibration

3.0 PERSONNEL INDOCTRINATION

3.1 The Annunciator System is powered from VBDP-5 Breaker 28.

4.0 INSTRUCTIONS

4.1 Respond to alarms on the ES(B)-JH1 Lampbox as indicated on Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP ACTIONS

None

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HPI ES B ACTUATION

EVENT POINT 0923

INDICATED CONDITION:

O HPI ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RCS PRESSURE <1500 PSIG
- o RCS PRESSURE <500 PSIG
- o RB PRESSURE >4 PSIG
- O MANUAL ACTUATION OF HPI
- O ES STATUS LIGHTS FOR AFFECTED CHANNELS CHANGE STATE

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

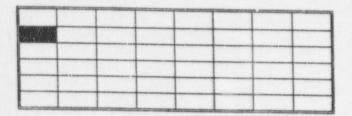
THIS ALARM INDICATES HPI HAS ACTUATED, OR SHOULD HAVE ACTUATED BY EITHER 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM LPI OR 4 PSIG REACTOR BUILDING PRESSURE. UPON RECEIPT OF THIS ALARM ES SHOULD BLOCK LOAD.

HPI BI-STABLES WILL TRIP AT ≤ 1540 PSIG AS SENSED BY RC-3B-PT3

REFERENCES: DRAWING 208-028 SHEET ESB-31

SENSING ELEMENT: 63-Z1A/RC-1, RC-2, RC-3, ES ACTUATION RELAY RC-3B-PT3

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LOAD SEQUENCE BLOCK 2 ACTUATION B

EVENT POINT 1023

INDICATED CONDITION:

o LOADING SEQUENCE BLOCK 2 ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O ES CHANNEL STATUS INDICATION
- O LOSS OF POWER TO AN ES ACTUATION CHANNEL CABINET
- O FAILURE OF AN ES CHANNEL SENSING ELEMENT
- O ES CHANNEL TESTING IN PROGRESS

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

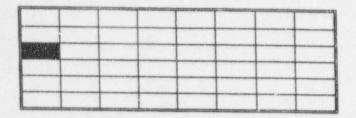
HPI HAS ACTUATED EITHER BY 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM LPI OR 4# RB PRESSURE AND ES EQUIPMENT STARTS OR

ONLY ONE OF THE HPI ACTUATION RELAYS HAS ACTUATED, AN ES CABINET HAS LOST POWER OR A SENSING ELEMENT HAS FAILED AND ES EQUIPMENT IS NOT STARTING

REFERENCES: DRAWING 208-028 SHEET ESB-25

SENSING ELEMENT: 62X1/RC-1, RC-2, RC-3, ES ACTUATION RELAYS

ESD ANNUNCIATOR RESPONSE	ES-JH1-01-03	D-01-03
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BLOCK 3 ACTUATION B

EVENT POINT 1025

INDICATED CONDITION:

o LOADING SEQUENCE BLOCK 3 ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O ES CHANNEL STATUS INDICATION
- O LOSS OF POWER TO AN ES ACTUATION CHANNEL CABINET
- O FAILURE OF AN ES CHANNEL SENSING ELEMENT
- O ES CHANNEL TESTING IN PROGRESS

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

HPI HAS ACTUATED EITHER BY 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM LPI OR 4# RB PRESSURE AND ES EQUIPMENT STARTS OR

ONLY ONE OF THE HPI ACTUATION RELAYS HAS ACTUATED, AN ES CABINET HAS LOST POWER OR A SENSING ELEMENT HAS FAILED AND ES EQUIPMENT IS NOT STARTING

REFERENCES: DRAWING 208-028 SHEET ESB-25

SENSING ELEMENT: 62X2B/RC-1, RC-2, RC-3 ES ACTUATION RELAY

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BLOCK 4
ACTUATION B

EVENT POINT 1026

INDICATED CONDITION:

o LOADING SEQUENCE BLOCK 4 ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O ES CHANNEL STATUS INDICATION
- O LOSS OF POWER TO AN ES ACTUATION CHANNEL CABINET
- O FAILURE OF AN ES CHANNEL SENSING ELEMENT
- O ES CHANNEL TESTING IN PROGRESS

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

HPI HAS ACTUATED EITHER BY 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM LPI OR 4# RB PRESSURE AND ES EQUIPMENT STARTS OR

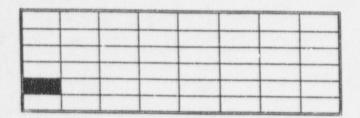
ONLY ONE OF THE HPI ACTUATION RELAYS HAS ACTUATED, AN ES CABINET HAS LOST POWER OR A SENSING ELEMENT HAS FAILED AND ES EQUIPMENT IS NOT STARTING TO RESET A BLOCK 4 ACTUATION THE HPI SEAL-IN RESET PUSH-BUTTON MUST BE DEPRESSED.

REFERENCES: DRAWING 208-028 SHEET ESB-25

SENSING ELEMENT: 62X3/RC-1, RC-2, RC-3 ES ACTUATION RELAYS

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BLOCK 5
ACTUATION B

EVENT POINT 0853

INDICATED CONDITION:

O LOADING SEQUENCE BLOCK 5 ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O ES CHANNEL STATUS INDICATION
- O LOSS OF POWER TO AN ES ACTUATION CHANNEL CABINET
- O FAILURE OF AN ES CHANNEL SENSING ELEMENT
- O ES CHANNEL TESTING IN PROGRESS

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

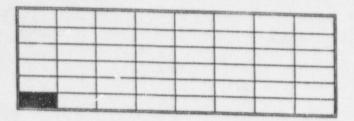
HPI HAS ACTUATED EITHER BY 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM LPI OR 4# RB PRESSURE AND ES EQUIPMENT STARTS OR

ONLY ONE OF THE HPI ACTUATION RELAYS HAS ACTUATED, AN ES CABINET HAS LOST POWER OR A SENSING ELEMENT HAS FAILED AND ES EQUIPMENT IS NOT STARTING

REFERENCES: DRAWING 208-028 SHEET ESB-25

SENSING ELEMENT: 62X4/RC1, 62X4/RC2, 62X4/RC3

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BLOCK 6
ACTUATION B

EVENT POINT 1019

INDICATED CONDITION:

o LOADING SEQUENCE BLOCK 6 ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O ES CHANNEL STATUS INDICATION
- O LOSS OF POWER TO AN ES ACTUATION CHANNEL CABINET
- O FAILURE OF AN ES CHANNEL SENSING ELEMENT
- O ES CHANNEL TESTING IN PROGRESS

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

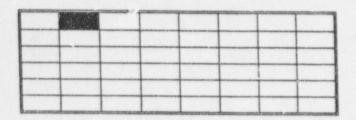
HPI HAS ACTUATED EITHER BY 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM LPI OR 4# RB PRESSURE AND ES EQUIPMENT STARTS

ONLY ONE OF THE HPI ACTUATION RELAYS HAS ACTUATED, AN ES CABINET HAS LOST POWER OR A SENSING ELEMENT HAS FAILED AND ES EQUIPMENT IS NOT STARTING TO RESET A BLOCK 6 ACTUATION THE HPI SEAL-IN RESET PUSH-BUTTON MUST BE DEPRESSED.

REFERENCES: DRAWING 208-028 SHEET ESB-25

SENSING ELEMENT: 62X5 ES ACTUATION RELAY

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DIVERSE CONTAINMENT ISOLATION B

EVENT POINT 1114

INDICATED CONDITION:

o PARTIAL CONTAINMENT ISOLATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O AUTOMATIC ACTUATION HPI "B"

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

THIS ALARM INDICATES A PARTIAL CONTAINMENT ISOLATION HAS OCCURRED. THE FOLLOWING VALVES SHOULD CLOSE:

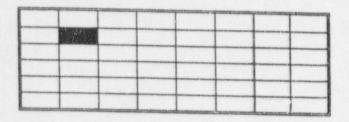
LRV-71	LRV-73	CAV-2	CAV-6	CAV-7	CAV-431	CFV-25
CFV-26	CFV-27	CFV-28	CFV-29	CFV-42	MUV-49	MSV-130
MSV-148	WDV-4	WDV-61	WDV-62	WDV-405	DWV-160	MUV-27

REFERENCES: DRAWING 208-028 SHEET ESB-55

SENSING ELEMENT: 63Z-4B ES ACTUATION RELAY

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HPI B FLOW HIGH/LOW

EVENT POINT 1069

INDICATED CONDITION:

o LOOP B1 HPI FLOW IS >263 CPM AS SENSED BY MU-23-FS1

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HPI WIDE RANGE FLOW METER, MU-23-FI1

OPERATOR ACTIONS FOR A VALID MEARM:

- O REFER TO EOP-13 FOR HPI THEOTTLING REQUIREMENTS
- O THROTTLE MUV-25 AS REQUIRED

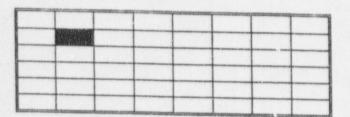
DISCUSSION:

RUNOUT CONDITIONS FOR A MAKEUP PUMP MAY BE VERIFIED BY OBSERVING MAKE UP PUMP CURRENT INDICATION FOR FLUCTUATIONS. ALSO FLOW OSCILLATIONS MAY OCCUR DURING HIGH FLOW CONDITIONS. IF ANY OF THESE SYMPTOMS ARE EVIDENT ON OPERATING MAKE UP PUMPS CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE MAKE UP PUMP.

REFERENCES: DRAWING 208-041 SMEET MU-047

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HPI B FLOW HIGH/LOW

EVENT POINT 1070

INDICATED CONDITION:

o LOOP B2 HPI FLOW IS >263 GPM AS SENSED BY MU-23-FS3

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HPI WIDE RANGE FLOW METER, MU-23-FI3

OPERATOR ACTIONS FOR A VALID ALARM:

- o REFER TO EOP-13 FOR HPI THROTTLING REQUIREMENTS
- O THROTTLE MUV-26 AS REQUIRED

DISCUSSION:

RUNOUT CONDITIONS FOR A MAKEUP PUMP MAY BE VERIFIED BY OBSERVING MAKE UP PUMP CURRENT INDICATION FOR FLUCTUATIONS. ALSO FLOW OSCILLATIONS MAY OCCUR DURING HIGH FLOW CONDITIONS. IF ANY OF THESE SYMPTOMS ARE EVIDENT ON OPERATING MAKE UP PUMPS CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE MAKE UP PUMP.

REFERENCES: DRAWING 208-041 SHEET MU-047

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HPI B FLOW HIGH/LOW

EVENT POINT 1073

INDICATED CONDITION:

O LOOP B1 HPI FLOW IS <75 GPM AS SENSED BY MU-23-FS1 COINCIDENT WITH A HPI ACTUATION SIGNAL

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O HPI LOW RANGE FLOW METER, MU-23-FI5-1

OPERATOR ACTIONS FOR A VALID ALARM:

- O REFER TO EOP-13 FOR HPI THROTTLING REQUIREMENTS
- O VERIFY PROPER MAKE UP PUMP OPERATION
- O ENSURE EITHER, >200 GPM TOTAL HPI FLOW PER RUNNING MAKEUP PUMP OR BOTH MAKE UP PUMP RECIRC VALVES, MUV-53 AND MUV-257 ARE OPEN OR HPI RECIRC VALVES TO RB SUMP (MUV-543, 544, 545, & 546) ARE OPEN PER AP-404, EOP-4, OR EOP-13

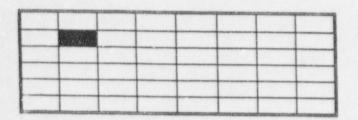
DISCUSSION:

LOW FLOW CONDITIONS FOR AN OPERATING MAKE UP PUMP CAN RESULT IN MAKE UP PUMP DAMAGE. DURING PERIODS OF LOW FLOW THE MAKE UP PUMP RECIRC VALVES MUST BE OPEN.

REFERENCES: DRAWING 208-041 SHEET MU-047

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HPI B FLOW HIGH/LOW

EVENT POINT 1074

INDICATED CONDITION:

O LOOP B2 HPI FLOW IS <75 GPM AS SENSED BY MU-23-FS3 COINCIDENT WITH A HPI ACTUATION SIGNAL

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HPI LOW RANGE FLOW METER, MU-23-FI7-1

OPERATOR ACTIONS FOR A VALID ALARM:

- o REFER TO EOP-13 FOR HPI THROTTLING REQUIREMENTS
- O VERIFY PROPER MAKE UP PUMP OPERATION
- ENSURE EITHER, >200 GPM TOTAL HPI FLOW PER RUNNING MAKEUP PUMP OR BOTH MAKE UP PUMP RECIRC VALVES, MUV-53 AND MUV-257 ARE OPEN OR HPI RECIRC VALVES TO RB SUMP (MUV-543, 544, 545, & 546) ARE OPEN PER AP-404, EOP-4, OR EOP-13

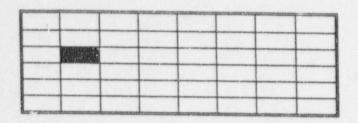
DISCUSSION:

LOW FLOW CONDITIONS FOR AN OPERATING MAKE UP PUMP CAN RESULT IN MAKE UP PUMP DAMAGE. DURING PERIODS OF LOW FLOW THE MAKE UP PUMP RECIRC VALVES MUST BE OPEN.

REFERENCES: DRAWING 208-041 SHEET MU-047

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LPI (DHV-6) OPEN

EVENT POINT 0218

INDICATED CONDITION:

o DHV-6 NOT FULL CLOSED AND RCS PRESSURE >200 PSIG AS SENSED BY RC-3A-PS4

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o DHV-6 INDICATION
- o RCS PRESSURE INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

- o REFER TO EOP-08 IF ON LPI.
- O IF ON DECAY HEAT REMOVAL THEN ENSURE PROPER DH FLOW PATH.
- O REFER TO OP-404 FOR MINIMUM FLOW LIMITATIONS.

DISCUSSION:

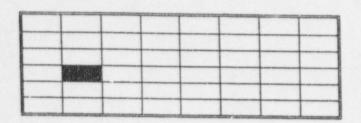
THIS ALARM MAY INDICATE THE ACI SETPOINT IS BEING APPROACHED (ABOUT 250#) IF THIS IS OCCURRING THEN THE OPERATOR SHOULD REDUCE RCS PRESSURE. CARE SHOULD BE TAKEN AS TO NOT OVERPRESSURIZE THE DECAY HEAT SYSTEM. WHILE ON LPI THIS ALARM WOULD INDICATE A LOW FLOW CONDITION ON THE OPERATING DECAY HEAT PUMP.

REFERENCES: DRAWING 208-021 SHEET DH-06

SENSING ELEMENT: RC-3A-PS4 AND 33 AC (CLOSED LIMIT SWITCH FOR DHV-6)

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LPI B FLOW HIGH/LOW

EVENT POINT 0228

INDICATED CONDITION:

O DHP-1/ FLOW >3750 GPM AS SENSED BY DH-1-FS2 (3650 TO 3850 GPM)

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O DECAY HEAT FLOW INDICATOR, DH-1-FI-2 INDICATES HIGH FLOW

OPERATOR ACTIONS FOR A VALID ALARM:

- O REFER TO OP-404 FOR MAXIMUM DECAY HEAT FLOW LIMITATIONS
- O VERIFY PROPER OPERATION OF DHV-111, "B" DECAY HEAT CONTROL VALVE.
- o REDUCE FLOW BY EITHER THROTTLING DHV-111 OR DHV-6, CLOSED.

DISCUSSION:

THIS ALARM MAY INDICATE THE DECAY HEAT PUMP IS EXCEEDING ITS MAXIMUM FLOW. IF THIS OCCURS PUMP DAMAGE MAY RESULT FROM CAVITATION INDUCED BY PUMP RUNOUT. IF INDICATIONS OF CAVITATION EXIST THEN CONSIDERATION SHOULD BE GIVEN TO SECURING THE DECAY HEAT PUMP.

REFERENCES: DRAWING 208-021 SHEET DH-24

SENSING ELEMENT: DH-1-FS2

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ESD ANNUNCIATOR RESPONSE

LPIB FLOW HIGH/LOW

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EVENT POINT 0230

INDICATED CONDITION:

O DHP-18 FLOW <2800 GPM AS SENSED BY DH-1-FS2 FOR >5 SEC COINCIDENT WITH LPI ACTUATION "B" (2700 TO 2900 GPM)

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o DECAY HEAT FLOW INDICATOR, DH-1-FI2 INDICATES LOW FLOW

OPERATOR ACTIONS FOR A VALID ALARM:

- O REFER TO EOP
- o VERIFY PROPER OPERATION OF DHP-18
- O VERIFY PROPER OPERATION OF DHV-111, "B" DECAY HEAT CONTROL VALVE.
 O INCREASE FLOW BY EITHER THROTTLING DHV-111 OR DHV-6, OPEN.

DISCUSSION:

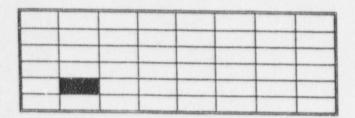
REFERENCES: DRAWING 208-021 SHEET DH-24

SENSING ELEMENT: DH-1-FS2

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ES-3H1-02-05

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ES B ACTUATION NOT BYPASSED

EVENT POINT 0930

INDICATED CONDITION:

- O RCS PRESSURE <1G40 PSIG AND HPI NOT BYPASSED
- O RCS PRESSURE <750 PSIG AND LPI NOT BYPASSED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RCS PRESSURE INDICATION
- O ES STATUS LIGHTS INDICATE ES NOT BYPASSED

OPERATOR ACTIONS FOR A VALID ALARM:

O IF DIRECTED BY AN APPROVED PROCEDURE AND WITH THE CONCURRENCE OF THE NSS/ANSS, THEN BYPASS HPI AND/OR LPI AS REQUIRED.

DISCUSSION:

THIS ALARM INDICATES THE ES SYSTEMS ARE STILL ABLE TO ACTUATE AND RCS PRESSURE IS DECREASING. IF THIS CONDITION OCCURS DURING A NORMAL PLANT COOLDOWN THEN ES MUST BE BYPASSED IN ORDER TO PREVENT INADVERTENT ACTUATION. IF, HOWEVER A PLANT TRANSIENT IS IN PROGRESS THIS ALARM INFORMS THE OPERATOR THAT ES ACTUATION IS IMMINENT.

REFERENCES: DRAWING 208-028 SHEET ESAB-06

SENSING ELEMENT: 62-B ES ACTUATION RELAY

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ES B ACTUATION NOT RESET

EVENT POINT 0928

INDICATED CONDITION:

- O RCS PRESSURE >1640 PSIG AND HPI NOT RESET
- O RCS PRESSURE >750 PSIG AND LPI NOT RESET

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RCS PRESSURE INDICATION
- O ES STATUS LIGHTS INDICATE ES NOT RESET

OPERATOR ACTIONS FOR A VALID ALARM:

O IF DIRECTED BY AN APPROVED PROCEDURE AND WITH THE CONCURRENCE OF THE NSS/ANSS, THEN RESET HPI AND/OR LPI AS REQUIRED.

DISCUSSION:

THIS ALARM INDICATES THE ES SYSTEMS ARE STILL BYPASSED AND RCS PRESSURE IS INCREASING. IF HPI/LPI RC PRESSURE BI-STABLES ARE NOT RESET PRIOR TO EXCEEDING 1750 PSIG (HPI) OR 900 PSIG (LPI), HPI AND LPI WILL ACTUATE WHEN THE ACTUATION CIRCUIT BYPASS BI-STABLE AUTOMATICALLY RESETS AND REMOVES THE CHANNEL FROM BYPASS.

REFERENCES: DRAWING 208-028 SHEET ESAB-06

SENSING ELEMENT: RC-3A-PS5, RC-3A-PS6

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LPI ES B ACTUATION

ES-JH1-03-01

EVENT POINT 0924

INDICATED CONDITION:

- o RCS PRESSURE IS <500 PSIG
- O REACTOR BUILDING PRESSURE >4 PSIG
- O MANUAL ACTUATION OF LPI "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RCS PRESSURE INDICATION
- o RB PRESSURE INDICATION
- O ES STATUS LIGHTS FOR AFFECTED CHANNELS CHANGE STATE

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

DISCUSSION:

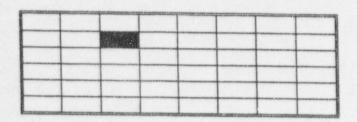
THIS ALARM INDICATES LPI HAS ACTUATED OR SHOULD HAVE ACTUATED BY EITHER 2 OUT OF 3 LPI BI-STABLES TRIPPED OR BY THE CASCADE ACTUATION FROM 4 PSIG REACTOR BUILDING PRESSURE OR THAT A MANUAL LPI ACTUATION HAS OCCURRED. LPI BI-STABLES WILL TRIP AT \leq 560 PSIG AS SENSED BY RC-3B-PT3

REFERENCES: DRAWING 208-028 SHEET ESB-42

SENSING ELEMENT: 63Z3 ES ACTUATION RELAY, RC-3B-PT3

ES-JH1-03-02

D-03-02



DH PUMP B TRIP

EVENT POINT 0220

INDICATED CONDITION:

O DHP-18 BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O GREEN INDICATOR LIGHT IS ON WITH A RED FLAG ON DHP-1B CONTROL STATION
- O AMBER ES STATUS LIGHT FOR DHP-18

OPERATOR ACTIONS FOR A VALID ALARM:

- o REFER TO EOP-11, LOSS OF DECAY HEAT REMOVAL
- O PLACE "A" DECAY HEAT TRAIN IN SERVICE PER OP-404
- O INVESTIGATE CAUSE OF PUMP TRIP

DISCUSSION:

IF CAUSE OF PUMP TRIP IS NOT APPARENT CARE SHOULD BE EXERCISED IN STARTING DHP-1A PUMP. SUCTION AND DISCHARGE FLOW PATHS SHOULD BE VERIFIED PRIOR TO ALTERNATE DECAY HEAT TRAIN STARTUP.

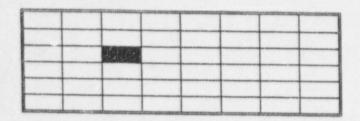
REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-021 SHEET ESB-42

SENSING ELEMENT: DHP-1B CONTROL SWITCH CONTACTS CS/SC AND CS/O

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ES-JH1-03-03 | D-03-03



DH PUMP B MOTOR **OVERLOAD**

EVENT POINT 0224

INDICATED CONDITION:

o DHP-18 MOTOR AMPS >115% RATED LOAD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o DHP-1B HIGH MOTOR AMPS
- o DHP-18 TRIPS

OPERATOR ACTIONS FOR A VALID ALARM:

- o REDUCE DHP-1B LOAD BY THROTTLING DHV-111 OR DHV-6
- O IF LOAD REMAINS HIGH ON DHP-18 CONSIDER ALTERNATING DECAY HEAT TRAINS PER OP-404
- O HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS

DISCUSSION:

THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

IT IS POSSIBLE TO HAVE THIS ALARM PRIOR TO THE BREAKER TRIP.

REFERENCES: DRAWING 208-021 SHEET DH-02

SENSING ELEMENT: DHP-1B OVERCURRENT DEVICES (51 IOC OR 51 TOC)

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	-	 -	 	-
-	ALCOHOLD STATE	 	 	-
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ESD ANNUNCIATOR RESPONSE

ES-JH1-03-04

D-03-04

OUT OF SERVICE

DH PUMP B

EVENT POINT 0222

O DHP-1B BREAKER IS RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O NO INDICATING LIGHTS ON CONTROL STATION
- O NO ES STATUS INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

O INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT

DISCUSSION:

ADDRESS TS REQUIREMENTS CONCERNING THIS CONDITION

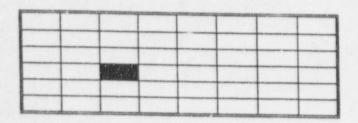
REFERENCES: DRAWING 208-021 SHEET DH-02

SENSING ELEMENT: DHP-1B BREAKER RELAY (52 H)

ESD	ANNUNCIAT	OR	RESPONSE
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ES-JH1-03-04

D-03-04



DH PUMP B OUT OF SERVICE

EVENT POINT 0243

INDICATED CONDITION:

O DHP-18 BREAKER HAS NO DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O NO INDICATING LIGHTS ON DHP-1B CONTROL STATION
- O ES STATUS LIGHTS INDICATE BREAKER POSITION

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY CLOSED DPDP-5B SWITCH 10
- O VERIFY DC KNIFE SWITCH FOR DHP-1B IS CLOSED

DISCUSSION:

THIS CONDITION DISABLES REMOTE BREAKER OPERATION AND PROTECTIVE RELAYING. REFER TO OP-703 FOR INSTRUCTIONS ON LOCAL BREAKER OPERATION.

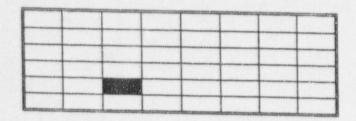
REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-021 SHEET DH-02

SENSING ELEMENT: DHP-1B BREAKER RELAY (27C)

ESD ANNUNCIATOR RE	SPON	SE
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ES-3H1-03-05 | D-03-05



DH PUMP B SUCT TEMP HIGH

EVENT POINT 0232

INDICATED CONDITION:

o DHP-1B SUCTION TEMP IS >280°F AS SENSED BY DH-6-TS2

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o DHP-1B SUCTION TEMP. INDICATOR, DH-6-TI2 INDICATES HIGH

OPERATOR ACTIONS FOR A VALID ALARM:

- O VERIFY PROPER "B" DC SYSTEM OPERATION BY CHECKING DC SURGE TANK LEVEL, DC PUMP RUNNING AND DC CONTROL VALVES SETPOINT NORMAL.
- O VERIFY PROPER DC RAW WATER OPERATION BY CHECKING RWP-3B RUNNING, RWP-3B DISCHARGE PRESSURE GOOD AND DC RAW WATER TEMP NORMAL
- O INCREASE DC COOLING TO THE DC HEAT EXCHANGER BY INCREASING SETPOINT
- O IF RCS TEMPERATURE CONTINUES TO RISE CONSIDER ALTERNATING DECAY HEAT TRAINS PER OP-404.

DISCUSSION:

THIS ALARM INDICATES A LOSS OF COOLING TO THE RCS IS OCCURRING. CORE COOLING MUST BE REGAINED AS SOON AS POSSIBLE.

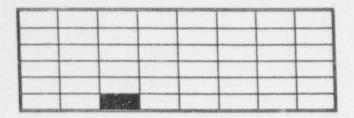
REFERENCES: DRAWING 208-021 SHEET DH-24

SENSING ELEMENT: DH-6-TS2

ESD ANNUNCIATOR RE	ESPON!	5E
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ES-JH1-03-06

D-03-06



PLOW FLOW LOW

EVENT POINT 0226

INDICATED CONDITION:

O DHP-1B FLOW RATE <1500 GPM AS SENSED BY DH-1-FS4 WITH THE DHP-1B CONTROL HANDLE IN NORMAL AFTER START.

DHP-1B RUNNING AND MOTOR AMPERAGE IS BELOW THE OPERATOR ADJUSTED SETPOINT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o DECAY HEAT FLOW INDICATOR, DH-1-FI2 INDICATES LOW FLOW
- O DHP-1B CONTROL STATION AMP METER

OPERATOR ACTIONS FOR A VALID ALARM:

- o INCREASE DHP-1B FLOW BY THROTTLING OPEN DHV-111 OR DHV-6
- O REFER TO OP-404 CONCERNING DECAY HEAT PUMP LOW FLOW OPERATION.
- READJUST DHP-1B AMP MONITOR, DH-57-IR, LOCATED INSIDE MCB ON HVC SECTION, IF NECESSARY PER OP-404
- O IF DH FLOW CANNOT BE RECOVERED THEN CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS PER OP-404.

DISCUSSION:

OPERATION AT LOW FLOW RATES MAY REDUCE DH PUMP LIFE, AND SHOULD BE AVOIDED.

DHP-1B AMP MONITOR CAN BE ADJUSTED TO ALARM AT SLIGHTLY LESS THAN DHP STEADY STATE OPERATION.

REFERENCES: DRAWING 208-021 SHEET DH-02

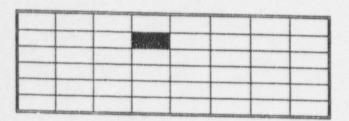
SENSING ELEMENT: DH-1-FS4, DHP-1B CONTROL HANDLE CONTACTS AND DH-57-IR

ENCLOSURE 1 (Page 24 of 56)

ESD ANNUNCIATOR RESPONSE

ES-JH1-04-02

D-04-02



DC PUMP B

EVENT POINT 0203

INDICATED CONDITION:

O DCP-18 BREAKER OPEN AND CONTROL HANDLE IN NORMAL AFTER START

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O GREEN INDICATOR LIGHT WITH A RED FLAG ON DCP-1B CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- O IF DH SYSTEM IS OPERATING, CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS PER OP-404
- O INVESTIGATE DCP-18 PUMP, MOTOR, AND BREAKER

DISCUSSION:

DCP-1B TRIP REMOVES COOLING FOR THE DH PUMP, BS PUMP, DC RW PUMP AND THE DC COOLED MAKE UP PUMP. ANY OF THESE PUMPS RUNNING WHEN THE DC PUMP TRIPS SHOULD BE SECURED AS SOON AS POSSIBLE. WITH THE EXCEPTION OF THE MAKE UP PUMP WHICH SHOULD BE SWAPPED OVER TO SW COOLING, PER OP-408.

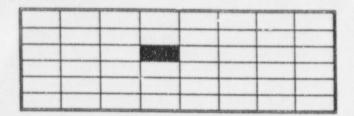
REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: CS/SC, CS/O, R/B (CONTROL STATION CONTACTS)

ENCLOSURE 1 (Page 25 of 56)

ESD ANNUNCIATOR RESPONSE ES-JH1-04-03 D-04-03



DC PUMP B MOTOR OVERLOAD

EVENT POINT 0201

INDICATED CONDITION:

O DCP-18 MOTOR AMPS >115% RATED LOAD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o DCP-1B HIGH MOTOR AMPS

OPERATOR ACTIONS FOR A VALID ALARM:

O INSPECT PUMP AND MOTOR FOR PROPER OPERATION

O IF INSPECTION REVEALS MOTOR OR PUMP MALFUNCTION CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DH TRAINS PER OP-404

DISCUSSION:

THE LOSS OF A DC PUMP REMOVES COOLING FOR THE DH PUMP, BS PUMP, DC RW PUMP AND THE DC COOLED MAKE UP PUMP. ANY OF THESE PUMPS RUNNING WHEN THE DC PUMP TRIPS SHOULD BE SECURED AS SOON AS POSSIBLE. WITH THE EXCEPTION OF THE MAKE UP PUMP WHICH SHOULD BE SWAPPED OVER TO SW COOLING. IF DC PUMP HAS TO BE TRIPPED AFTER AN ES ACTUATION, HPI SEAL-IN RESET MUST BE DEPRESSED BEFORE THE PUMP CAN BE SECURED.

REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: 49X RELAY IN BREAKER CUBICLE

ENCLOSURE 1 (Page 26 of 56)

ESD ANNUNCIATOR RESPONSE ES-JH1-04-04 D-04-04 DC PUMP B OUT OF SERVICE **EVENT POINT 0211** INDICATED CONDITION: O DCP-1B BREAKER IS RACKED OUT REDUNDANT INDICATION WHICH WILL VERIFY ALARM: O NO INDICATING LIGHTS ON DCP-1B CONTROL STATION O NO ES STATUS INDICATION OPERATOR ACTIONS FOR A VALID ALARM: O INVESTIGATE THE CAUSE FOR DCP-1B BREAKER BEING RACKED OUT DISCUSSION: ADDRESS TS REQUIREMENTS CONCERNING THIS CONDITION. THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS. REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: B/P CONTACTS IN THE DC PUMP BREAKER CUBICLE

ESD ANNUNCIATOR	RESPONSE	ES-JH1-04-04	D-04-04

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DC PUMP B OUT OF SERVICE

EVENT POINT 0213

INDICATED CONDITION:

O DCP-1B BREAKER HAS NO DC CONTROL POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o NO INDICATING LIGHTS ON DCP-1B CONTROL STATION
- O ES STATUS LIGHTS INDICATE BREAKER POSITION

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY CLOSED DPDP-5B SWITCH 9
- o VERIFY DC CONTROL POWER TOGGLE SWITCH ON DCP-1B BREAKER IS "ON"

DISCUSSION:

THIS CONDITION DISABLES REMOTE BREAKER OPERATION AND PROTECTIVE RELAYING. REFER TO OP-703 FOR INSTRUCTIONS ON LOCAL BREAKER OPERATION.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: 27C RELAY IN BREAKER CUBICLE

ESD ANNUNCIATOR RESPONSE

ES-JH1-04-05

D-04-05



DC PUMP B DISCH PRESS LOW

EVENT POINT 0202

INDICATED CONDITION:

O DCP-1B DISCHARGE PRESSURE IS <30 PSIG FOR > 5 SEC. AS SENSED BY DC-56-PS, WITH DCP-1B BREAKER CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o DCP-1B DISCHARGE PRESSURE INDICATOR, DC-6-PI
- o DCP-1B CURRENT INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY DC SURGE TANK IS >8.5 FEET, IF NOT, NOTIFY AUX BLDG OPERATOR TO MANUALLY FILL DCT-1B
- O IF DISCHARGE PRESSURE CANNOT BE RECOVERED THEN CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS PER OP-404

DISCUSSION:

THE LOSS OF A DC PUMP REMOVES COOLING FOR THE DH PUMP, BS PUMP, DC RAW PUMP AND THE DC COOLED MAKE UP PUMP. ANY OF THESE PUMPS RUNNING WHEN THE DC PUMP IS LOST SHOULD BE SECURED AS SOON AS POSSIBLE, WITH THE EXCEPTION OF THE MAKE UP PUMP, WHICH SHOULD BE SWAPPED OVER TO SW COOLING. IF DC PUMP HAS TO BE TRIPPED AFTER AN ES ACTUATION, HPI SEAL-IN RESET MUST BE DEPRESSED BEFORE THE PUMP CAN BE SECURED.

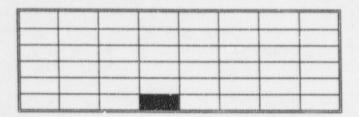
REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: DC-56-PS

ESD ANNUNCIATOR R	ESPONSE
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ES-JH1-04-06

D-04-06



DC TANK B LEVEL HIGH/LOW

EVENT POINT 0207

INDICATED CONDITION:

o "B" DC SURGE TANK LEVEL IS >11" AS SENSED BY DC-52-LS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o DC SURGE TANK LEVEL INDICATION, DC-54-LI
- O LOCAL SURGE TANK LEVEL INDICATION
- O DECREASING RCS LEVEL WHILE ON DECAY HEAT

OPERATOR ACTIONS FCP A VALID ALARM:

- O VERIFY AUTOMATIC DC SURGE TANK FILL VALVE, DCV-12 IS CLOSED IF NOT THEN MANUALLY ISOLATE DCV-12 BY CLOSING DCV-60
- O VERIFY "B" DC SYSTEM RADIATION MONITOR, RML-6 READING IS NORMAL
- O IF ON DECAY HEAT REFER TO AP-404
- o CONSIDERATION SHOULD BE GIVEN TO ALTERNATE DH TRAINS PER OP-404

DISCUSSION:

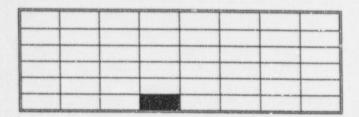
IF THE HIGH SURGE TANK LEVEL IS DUE TO A DH TO DC LEAK THEN THE DC SURGE TANK MAY CONTINUE TO FILL. THE DC SURGE TANK VENTS TO THE AUX BLDG VENT HEADER SO CONSIDERATION SHOULD BE GIVEN TO DRAINING DC TO THE AUX BLDG SUMP TO PREVENT OVERFLOWING THE TANK TO THE VENT DUCT AND ALIGNING THE DC SURGE TANK VENT TO THE WASTE GAS SYSTEM.

DC SURGE TANK FILL VALVE, DCV-12 SHOULD OPEN AT 8'6" AND CLOSE AT 11"

REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: DC-52-LS

ESD ANNUNCIATOR	RESPONSE	ES-JH1-04-06	D-04-06
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DC TANK B LEVEL HIGH/LOW

EVENT POINT 0208

INDICATED CONDITION:

o "B" DC SURGE TANK LEVEL IS <8'6" AS SENSED BY DC-52-LS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O DC SURGE TANK LEVEL INDICATION, DC-54-LI
- O LOCAL SURGE TANK LEVEL INDICATION
- o OSCILLATING CURRENT INDICATIONS ON DCP-1B

OPERATOR ACTIONS FOR A VALID ALARM:

- O VERIFY AUTOMATIC DC SURGE TANK FILL VALVE, DCV-12 IS OPEN
- O HAVE AUX BLDG OPERATOR FILL DC SURGE TANK LOCALLY
- o CONSIDERATION SHOULD BE GIVEN TO ALTERNATE DH TRAINS PER OP-404

DISCUSSION:

FILL SOURCE FOR DC SURGE TANK IS UNIT 1/2 DEMIN WATER

DC SURGE TANK FILL VALVE, DCV-12 SHOULD OPEN AT 8'6" AND CLOSE AT 11'"

REFERENCES: DRAWING 208-019 SHEET DC-02

SENSING ELEMENT: DC-52-LS

ESD ANNUNCIATOR RESPONSE	ES-JH1-05-01	D-05-01

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RC LOOP B VENT VLVS OPEN

EVENT POINT 1877

INDICAT	FD	CON	DIT	TON .

o BOTH "B" LOOP VENT VALVES, RCV-163 AND RCV-164 ARE ENERGIZED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOOP VENT VALVE POSITION INDICATION IS OPEN ON MCB
- o LOOP VENT VALVE FLOW WHITE INDICATING LIGHT IS ON
- o RCS PRESSURE DECREASING

OPERATOR ACTIONS FOR A VALID ALARM:

O CLOSE THE OPEN VENT VALVE IF NECESSARY

DISCUSSION:

THE LOOP VENT VALVES ARE MOUNTED IN SERIES SO OPENING ONE VALVE SHOULD NOT CAUSE AN RCS LEAK.

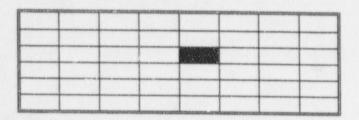
REFERENCES: DRAWING 208-047 SHEET RC-33

SENSING ELEMENT: POSITION SWITCH ON VALVES (33)

ESD ANNUNCIATOR R	ESPONSE
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ES-JH1-05-03

D-05-03



AH FAN 15B TROUBLE

EVENT POINT 0398

INDICATED CONDITION:

O AHF-15B BREAKER OPEN AND CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O GREEN LIGHT WITH A RED FLAG ON CONTROL STATION
- O AMBER ES STATUS LIGHT

OPERATOR ACTIONS FOR A VALID ALARM:

- o START AHF-15A
- O INVESTIGATE CAUSE OF AIR HANDLING FAN TRIP.

DISCUSSION:

AHF-15B IS THE COOLING FAN FOR DCP-1A AND DCP-1B. THE PUMPS NORMALLY OPERATE WITHOUT EITHER AIR HANDLING FAN IN OPERATION BUT ARE REQUIRED DURING ACCIDENT SCENARIOS WHEN HEAT LOAD IN THE SEA WATER ROOM IS HIGH.

REFERENCES: DRAWING 208-005 SHEET AH-43

SENSING ELEMENT: CS/SC, CS/O, 42/B RELAY

D-05-03

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ESD ANNUNCIATOR RESPONSE

AH FAN 15B TROUBLE

EVENT POINT 0399

ES-JH1-05-03

INDICATED CONDITION:

O AHF-15B AIR FLOW IS <0.058" WATER AS SENSED BY AH-408-DPS AND THE CONTROL HANDLE IS IN NORMAL AFTER START.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- o START AHF-15A
- O INVESTIGATE CAUSE OF LOW AIR FLOW.

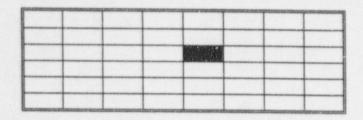
DISCUSSION:

AHF-15B IS THE COOLING FAN FOR DCP-1A AND DCP-1B. THE PUMPS NORMALLY OPERATE WITHOUT EITHER AIR HANDLING FAN IN OPERATION BUT ARE REQUIRED DURING ACCIDENT SCENARIOS WHEN HEAT LOAD IN THE SEA WATER ROOM IS HIGH. PRIMARY PLANT OPERATOR MAY CHECK LOCAL DIFFERENTIAL PRESSURE GAUGES AH-597-DPI (AHF-15A) AND AH-598-DPI (AHF-15B) TO DETERMINE FILTER AIR FLOW CONDITIONS.

REFERENCES: DRAWING 208-005 SHEET AH-43

SENSING ELEMENT: CS/SC, CS/O, AH-408-DPS

ESD ANNUNCIATOR	RESPONSE	ES-JH1-05-03	D-05-03
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AH FAN 15B TROUBLE

EVENT POINT 0400

INDICATED CONDITION:

O AHF-15B DISCHARGE DUCT TEMPERATURE IS >135°F AS SENSED BY AH-410-TS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o AHF-15B TRIPS
- O AHF-15B WHITE PERMISSIVE LIGHT ON CONTROL STATION IS OFF

OPERATOR ACTIONS FOR A VALID ALARM:

- O INVESTIGATE CAUSE OF HIGH DUCT TEMPERATURE
- O DO NOT ATTEMPT A START OF AH-15A UNTIL CAUSE OF HIGH TEMP IS DETERMINED

DISCUSSION:

THIS CONDITION MAY INDICATE A FIRE IN THE EXHAUST DUCTWORK OF AHF-15B. IF A FIRE CONDITION DOES EXIST REFER TO AP-880 FOR FURTHER GUIDANCE.

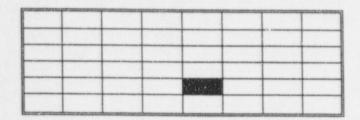
REFERENCES: DRAWING 208-005 SHEET AH-43

SENSING ELEMENT: AH-410-TS

ESD ANNUNCIATOR RESPONSE

ES-JH1-05-05

D-05-05



DC PUMP B SUCT TEMP HIGH

EVENT POINT 0209

INDICATED CONDITION:

o DCP-1B SUCTION TEMPERATURE IS >105°F AS SENSED BY DC-58-TS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o DCP-1B SUCTION TEMP INDICATION, DC-39-TI
- O DC RAW WATER TEMPERATURE INDICATOR RW-12-TI OR RW-32-TI
- O DH COOLER TEMPERATURE INDICATORS DH-2-TI2 OR DH-6-TI2

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE RWP-3B RUNNING
- o VERIFY RAW WATER DELTA TEMP FOR DHCCC HEAT EXCHANGER IS <10°
- O IF "B" DC TRAIN TEMPERATURE CANNOT BE REDUCED THEN CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS PER OP-404.

DISCUSSION:

THIS CONDITION MAY INDICATE A FOULED DC HEAT EXCHANGER. INDICATIONS ARE: HIGH RWP-3B DISCHARGE PRESSURE, HIGH RW DIFFERENTIAL TEMP OR LOW DC DIFFERENTIAL TEMP ACROSS THE DC HEAT EXCHANGER. ALSO VENTING THE DC HEAT EXCHANGER SHOULD BE CONSIDERED. IF DC PUMP HAS TO BE TRIPPED AFTER AN ES ACTUATION, HPI SEAL-IN RESET MUST BE DEPRESSED BEFORE THE PUMP CAN BE SECURED.

REFERENCES: DRAWING 208-019 SHEET DC-03

SENSING ELEMENT: DC-58-TS

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ESD ANNUNCIATOR RESPONSE	ES-JH1-05-06	D-05-06



BS/DH PUMP B DC FLOW LOW

EVENT POINT 1221

INDICATED CONDITION:

O DECAY HEAT PUMP 18 DC FLOW IS <30 GPM AS SENSED BY DC-68-FIS WITH DHP-18 BKR CLOSED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O DHP-1B LOCAL DC FLOW INDICATOR INDICATES LOW FLOW
- O COMPUTER POINT X323 WHICH MONITORS DHP-1B MOTOR STATOR TEMP
- o COMPUTER GROUP 74

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE DCP-1B RUNNING
- O INCREASE FLOW TO DHP-1B BY THROTTLING DCV-36 OR DCV-119 AS REQUIRED

DISCUSSION:

THE MAXIMUM ALLOWABLE DH PUMP STATOR TEMP IS 265° F (129.4°C, AS READ ON COMPUTER POINT X323). CONSIDERATION SHOULD BE MADE IN SHUTTING DOWN THE PUMP IF THIS TEMP IS REACHED.

DCV-36 AND DCV-119 ARE SEALED THROTTLED VALVES, IF CHANGES ARE MADE TO THEIR POSITION ADMINISTRATIVE MEASURES MUST BE CONSIDERED.

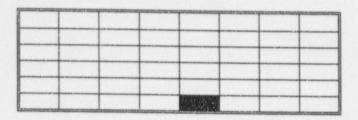
REFERENCES: DRAWING 208-019 SHEET DC-03

SENSING ELEMENT: DC-68-FIS

ESD ANNUNCIATOR RESPONSE

ES-JH1-05-06

D-05-06



BS/DH PUMP B DC FLOW LOW

EVENT POINT 1223

INDICATED CONDITION:

O BUILDING SPRAY PUMP 18 DC FLOW IS <25 GPM AS SENSED BY DC-74-FIS WITH BSP-18 BREAKER CLOSED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O BSP-1B LOCAL DC FLOW INDICATOR INDICATES LOW FLOW
- O COMPUTER POINT X-317 WHICH MONITORS BSP-1B MOTOR STATOR TEMP
- o COMPUTER GROUP 82

OPERATOR ACTIONS FOR A VALID ALARM:

- o INSURE DCP-1B RUNNING
- O INCREASE FLOW TO BSP-1B BY THROTTLING DCV-34

DISCUSSION:

THE MAXIMUM ALLOWABLE BS PUMP STATOR TEMP IS 300° F. (149°C), AS READ ON COMPUTER POINT X-317, CONSIDERATION SHOULD BE MADE IN SHUTTING DOWN THE PUMP IF THIS TEMP IS REACHED.

DCV-34 IS SEALED THROTTLED VALVE, IF CHANGES ARE MADE TO ITS POSITION, ADMINISTRATIVE MEASURES MUST BE CONSIDERED.

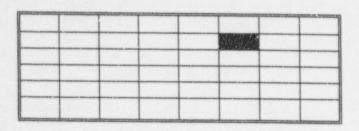
REFERENCES: DRAWING 208-019 SHEET DC-03

SENSING ELEMENT: DC-74-FIS

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ES-JH1-06-02

D-06-02



DH RW PUMP B

EVENT POINT 0018

INDICATED CONDITION:

O RWP-3B BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O GREEN LIGHT WITH RED FLAG ON RWP-3B CONTROL STATION
- o AMBER ES STATUS LIGHT

OPERATOR ACTIONS FOR A VALID ALARM:

O CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS PER AP-404

DISCUSSION:

THE AMOUNT OF DECAY HEAT LOAD AND THE INITIAL TEMPERATURE OF SYSTEM WILL DETERMINE HOW FAST THE DECAY HEAT TRAINS SHOULD BE TRANSFERRED.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

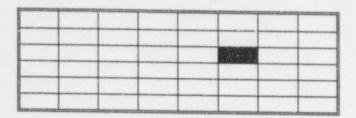
REFERENCES: DRAWING 208-050 SHEET RW-05

SENSING ELEMENT: 52S/B, 52H/A, CS/SC, CS/O

ESD ANNUNCIATOR	RESPONSE
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ES-JH1-06-03

D-06-03



DH RW PUMP B MOTOR OVERLOAD

EVENT POINT 0017

INDICATED CONDITION

o RWP-3B MOTOR AMPS ≥115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o HIGH RWP-3B MOTOR AMPS
- o RWP-3B TRIPS

OPERATOR ACTIONS FOR A VALID ALARM:

- O HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS
- O CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS PER OP-404

DISCUSSION:

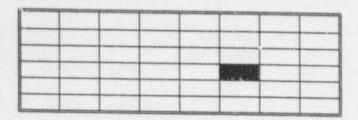
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

IT IS POSSIBLE TO HAVE THIS ALARM PRIOR TO THE BREAKER TRIP.

REFERENCES: DRAWING 208-050 SHEET RW-05

SENSING ELEMENT: RELAY 51

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ESD ANNUNCIATOR RESPONSE	ES-JH1-06-04	D-06-04



DH RW PUMP B OUT OF SERVICE

EVENT POINT 0016

INDICATED CONDITION:

O RWP-3B BREAKER HAS NO DC CONTROL POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O NO INDICATING LIGHTS ON CONTROL STATION
- O ES STATUS LIGHTS INDICATE BREAKER POSITION

OPERATOR ACTIONS FOR A VALID ALARM:

- O VERIFY CLOSED DPDP-58 SWITCH 10
- O VERIFY DC KNIFE SWITCH FOR RWP-3B BREAKER CLOSED

DISCUSSION:

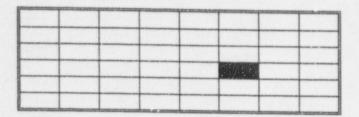
THIS CONDITION DISABLES REMOTE BREAKER OPERATION AND PROTECTIVE RELAYING. REFER TO OP-703 FOR INSTRUCTIONS ON LOCAL BREAKER OPERATION. THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-050 SHEET RW-05

SENSING ELEMENT: RELAY 27C LOCATED INSIDE BREAKER CUBICLE FOR RWP-3B

ESD ANNUNCIATOR RESPONSE	ES-JH1-06-04	A-06-04	



DH RW PUMP B OUT OF SERVICE

EVENT POINT 0019

INDICATED CONDITION:

O RWP-3B BREAKER IS RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o NO INDICATING LIGHTS ON RWP-3B CONTROL STATION
- o NO ES STATUS INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

O INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT

DISCUSSION:

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.
THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS

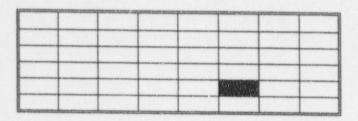
REFERENCES: DRAWING 208-050 SHEET RW-05

SENSING ELEMENT: CONTACT 52H/b IN BREAKER CUBICLE FOR RWP-3B

ESD ANNUNCIATOR RESPONS	ESD	ANNUNCIATOR	RESPONSE
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ES-JH1-06-05

D-06-05



DH RW PUMP B DISCH PRESS LOW

EVENT POINT 0021

INDICATED CONDITION:

O RWP-3B DISCHARGE PRESS <15 PSIG AS SENSED BY RW-61-PS WITH PUMP BREAKER CLOSED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o RWP-3B DISCHARGE PRESSURE INDICATOR, RW-8-PI

OPERATOR ACTIONS FOR A VALID ALARM:

- O MONITOR PUMP CONTROL STATION CURRENT METER
- O SECURE PUMP IF SIGNS OF CAVITATION ARE EVIDENT

DISCUSSION:

CONSIDERATION SHOULD BE GIVEN TO PLACING THE ALTERNATE DECAY HEAT TRAIN IN SERVICE PER OP-404

REFERENCES: DRAWING 208-0:0 SHEET RW-05

SENSING ELEMENT: CONTACT 5.'S/a, RW-61-PS

ESD ANNUNCIATOR RESPONSE

ES-JH1-07-01

D-07-01

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RB ISOLATION ES B **ACTUATION**

EVENT POINT 0932

INDICATED CONDITION:

o RB ISOLATION ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RB PRESSURE >4 PSIG
- O MANUAL ACTUATION OF RB ISOLATION AND COOLING
- O ES STATUS LIGHTS FOR AFFECTED CHANNELS CHANGE STATE

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO EOP

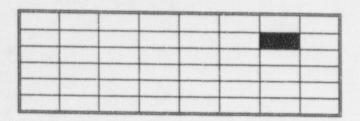
DISCUSSION:

THIS INDICATES THAT RB ISOLATION "B" HAS OCCURRED ON TWO OUT OF THREE CHANNELS, MANUAL RB ISOLATION ACTUATION HAS BEEN INITIATED. RB PRESSURE BI-STABLE WILL TRIP AT ≥ 3.34 +/- 0.2 PSIG AS SENSED BY BS-27/28/29-PS

REFERENCES: DRAWING 208-029 SHEET ESB-57

SENSING ELEMENT: 63Z1/RB1, 63Z1/RB2, 63Z/RB3, OR 1X1F/RBB, BS-27-PS, BS-28-PS AND BS-29-PS

ESD ANNUNCIATOR RESPONSE	ES-JH1-07-02	D-07-02



SW PUMP B

EVENT POINT 1828

INDICATED CONDITION:

O SWP-1B BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O GREEN LIGHT WITH RED FLAG ON SWP-1B CONTROL STATION
- O AMBER ES STATUS LIGHT

OPERATOR ACTIONS FOR A VALID ALARM:

- O ENSURE AUTO START OF SWP-1A
- O HAVE PREAKER CUBICLE CHECKED FOR DROPPED TARGETS
- O REFER TO AP-330

DISCUSSION:

EXERCISE CARE WHEN STARTING ALTERNATE SW PUMPS. ENSURE ANY FAILURES SUCH AS IMPROPER FLOW PATH OR SURGE TANK VOLUME, WHICH MAY HAVE DIRECTLY OR INDIRECTLY HAVE CAUSED THIS PUMP TO TRIP DO NOT CAUSE ALTERNATE PUMPS TO TRIP AFTER THEY ARE STARTED.

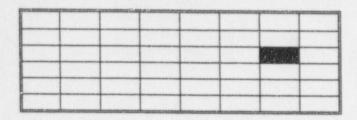
REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-056 SHEET SW-03

SENSING ELEMENT: 52S/B, 52H/A, CS/SC, CS/O

ES-JH1-07-03

D-07-03



SW PUMP B MOTOR OVERLOAD

EVENT POINT 1827

INDICATED CONDITION

o SWP-1B MOTOR AMPS >115% RATED LOAD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o HIGH MOTOR AMPS ON SWP-18
- o SWP-1B TRIP

OPERATOR ACTIONS FOR A VALID ALARM:

- o START SWP-1A
- O HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS

DISCUSSION:

THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

IT IS POSSIBLE TO HAVE THIS ALARM PRIOR TO THE BREAKER TRIP.

REFERENCES: DRAWING 208-056 SHEET SW-03

SENSING ELEMENT: RELAY 51

D-07-04

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ESB ANNUNCIATOR RESPONSE

SW PUMP B OUT OF SERVICE

ES-JH1-07-04

EVENT POINT 1820

INDICATED CONDITION:

O SWP-1B BREAKER RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O NO INDICATING LIGHTS ON SWP-1B CONTROL STATION
- O NO ES STATUS INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

O INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT

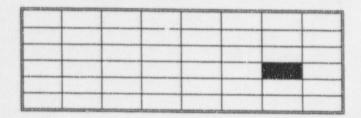
DISCUSSION:

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-050 SHEET SW-03

SENSING ELEMENT: CONTACT 52H/b IN BREAKER CUBICLE

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ESB ANNUNCIATOR RESPONSE	ES-JH1-07-04	D-07-04



SW PUMP B OUT OF SERVICE

EVENT POINT 1854

INDICATED CONDITION:

o SWP-1B BREAKER HAS NO DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O NO INDICATING LIGHTS ON SWP-1B CONTROL STATION
- O ES STATUS LIGHTS INDICATE BREAKER POSITION

OPERATOR ACTIONS FOR A VALID ALARM:

- O VERIFY DC KNIFE SWITCH FOR SWP-1B BREAKER CLOSED.
- o VERIFY CLOSED DPDP-5B SWITCH 10.

DISCUSSION:

THIS CONDITION DISABLES REMOTE BREAKER OPERATION AND PROTECTIVE RELAYING. REFER TO OP-703 FOR INSTRUCTIONS ON LOCAL BREAKER OPERATION. THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

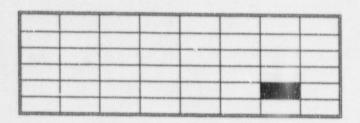
REFERENCES: DRAWING 208-050 SHEET SW-03

SENSING ELEMENT: RELAY 27C LOCATED INSIDE BREAKER CUBICLE FOR SWP-1B

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ES-JH1-07-05

D-07-05



SW PUMP B AUTO START

EVENT POINT 1829

INDICATED CONDITION:

O SWP-18 BREAKER CLOSED WITH THE CONTROL HANDLE IN NORMAL AFTER STOP

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O RED LIGHT WITH A GREEN FLAG ON SWP-1B CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY ADEQUATE SW PUMP DISCHARGE PRESSURE SW-2-PI
- O INVESTIGATE THE CAUSE OF SWP-18 AUTO START

DISCUSSION:

ANY AUTO START OF SWP-1B GIVES THIS ALARM (e.g., ES OR LOW SW SUPPLY HEADER PRESSURE).

REFERENCES: DRAWING 208-056 SHEET SW-03

SENSING ELEMENT: 525/a, CS/ST, CS/O

ENCLOSURE 1 (Page 49 of 56)

ESD ANNUNCIATOR RESPONSE	ES-JH1-07-06	D-07-06
	SW PUM	MP B
	LOCKET	OUT
	EVENT POIN	T 1899
INDICATED CONDITION:		
o SWP-1B IN PULL-TO-LOCK POSITION		
REDUNDANT INDICATION WHICH WILL VERIFY ALA	ARM:	
o SWP-1B CONTROL HANDLE ON MCB		
OPERATOR ACTIONS FOR A VALID ALARM:		
o REFER TO AP-330		
DISCUSSION:		

REFERENCES: DRAWING 208-056 SHEET SW-03

SENSING ELEMENT: CB-ESFB-MP4

ESD ANNUNCIATOR RESPONSE	ES-JH1-08-01	D-08-01
	SW RW	PUMP B ED OUT
	EVENT POI	NT 1915
O RWP-2B CONTROL HANDLE IN PULL-TO-	LOCK POSITION	
REDUNDANT INDICATION WHICH WILL VERI O RWP-2B CONTROL HANDLE ON MCB		
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REDUNDANT INDICATION WHICH WILL VERI O RWP-2B CONTROL HANDLE ON MCB OPERATOR ACTIONS FOR A VALID ALARM:		
REDUNDANT INDICATION WHICH WILL VERI O RWP-2B CONTROL HANDLE ON MCB OPERATOR ACTIONS FOR A VALID ALARM:		

REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: CB-ESFB-ML4

ESD ANNUNCIATOR RESPONSE ES-JH1-08-02 D-08-02	ES-JH1-08-02 D-08-02
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SW RW PUMP B

EVENT POINT 0010

INDICATED CONDITION:

O RWP-2B BREAKER IS OPEN WITH CONTROL HANDLE IN THE NORMAL AFTER START POSITION

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O GREEN LIGHT WITH A RED FLAG ON RWP- 2B CONTROL STATION
- O AMBER ES STATUS LIGHT
- o LOW SW RW SYSTEM PRESSURE RW-23-PI, IF NO OTHER PUMP RUNNING

OPERATOR ACTIONS FOR A VALID ALARM:

- o START RWP-2A
- O HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS

DISCUSSION:

ENSURE ANY FAILURE THAT IS COMMON TO RWP-2A IS CORRECTED PRIOR TO STARTING RWP-2A TO PRECLUDE RENDERING IT UNAVAILABLE/INOPERABLE.

ENSURE A PROPER FLOW PATH IS AVAILABLE PRIOR TO STARTING RWP-2A.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: 52S/B, 52H/A, CS/SC, CS/O

ENCLOSURE 1 (Page 52 of 56)

D-08-03

ES-JH1-08-03

SW RW PUMP B MOTOR **OVERLOAD EVENT POINT 0009** INDICATED CONDITION O RWP-2B MOTOR AMPS >115% RATED LOAD REDUNDANT INDICATION WHICH WILL VERIFY ALARM: O HIGH MOTOR AMPS ON RWP-2B CONTROL STATION o RWP-2B TRIP OPERATOR ACTIONS FOR A VALID ALARM: o START RWP-2A O HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS DISCUSSION: THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER. IT IS POSSIBLE TO HAVE THIS ALARM PRIOR TO THE BREAKER TRIP.

ESD ANNUNCIATOR RESPONSE

REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: RELAY 51

ENCLOSURE 1 (Page 53 of 56)

ESD ANNUNCIATOR RESPONSE	ES-JH1-08-04	D-08-04

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SW RW PUMP B OUT OF SERVICE

EVENT POINT 0008

INDICATED CONDITION:

O RWP-2B BREAKER HAS NO DC CONTROL POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O NO INDICATING LIGHTS ON RWP-2B CONTROL STATION
- O ES STATUS LIGHTS INDICATE BREAKER POSITION

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY CLOSED DPDP-5B SWITCH 10
- O VERIFY DC KNIFE SWITCH IS CLOSED FOR RWP-2B BREAKER

DISCUSSION:

THIS CONDITION DISABLES REMOTE BREAKER OPERATION AND PROTECTIVE RELAYING. REFER TO OP-703 FOR INSTRUCTIONS ON LOCAL BREAKER OPERATION. THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

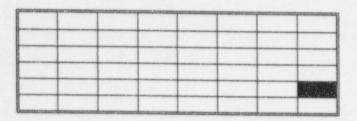
REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: RELAY 27C LOCATED INSIDE BREAKER CUBICLE FOR RWP-2B

ENCLOSURE 1 (Page 54 of 56)

ESD ANNUNCIATOR RESPONSE	ES-JH1-08-04	D-08-04	
	SW RW I	PUMP B SERVICE	
	EVENT POIN	POINT 0023	
INDICATED CONDITION:			
O BREAKER FOR RWP-2B BREAKER IS RACKED OU	т		
REDUNDANT INDICATION WHICH WILL VERIFY ALAF	RM.		
	CTATION		
o NO INDICATING LIGHTS ON RWP-2B CONTROL o NO ES STATUS INDICATION FOR RWP-2B	STATION		
o NO ES STATUS INDICATION FOR RWP-2B	STATION		
OPERATOR ACTIONS FOR A VALID ALARM:			
o NO ES STATUS INDICATION FOR RWP-2B			
OPERATOR ACTIONS FOR A VALID ALARM:			
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O NO ES STATUS INDICATION FOR RWP-2B OPERATOR ACTIONS FOR A VALID ALARM: O INVESTIGATE THE CAUSE FOR BREAKER BEING	RACKED OUT		
O NO ES STATUS INDICATION FOR RWP-2B OPERATOR ACTIONS FOR A VALID ALARM: O INVESTIGATE THE CAUSE FOR BREAKER BEING DISCUSSION:	RACKED OUT		

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ESD ANNUNCIATOR RESPONSE	ES-JH1-08-05	D-08-05



SW RW PUMP B AUTO START

EVENT POINT 0011

INDICATED CONDITION:

O RWP-2B BREAKER CLOSED WITH CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O RWP-2B RED INDICATING LIGHT WITH A GREEN FLAG ON THE CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY RW PUMP DISCHARGE PRESSURE RW-23-PI
- O INVESTIGATE THE CAUSE OF RWP-2B AUTO START

DISCUSSION:

ANY AUTO START OF RWP-2B GIVES THIS ALARM (e.g., ES OR LOW RW SUPPLY HEADER PRESSURE).

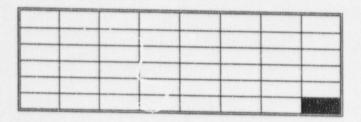
REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: 525/a, CS/ST, CS/O

ESD ANNUNCIATOR RESPONSE

ES-JH1-08-06

D-08-06



ES B ACTUATION TEST BYPASS

EVENT POINT 0770

INDICATED CONDITION:

O ANY ES "B" TEST SELECTOR SWITCH NOT IN THE "OFF PUSHED IN" POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

• RED 'MONTHLY TEST' OR RED 'REFUELING TEST' LIGHT ILLUMINATED ON ONE OR MORE OF THE FOLLOWING SWITCHES:

HPI AUTO TEST SELECT SWITCH "B" LPI AUTO TEST SELECT SWITCH "B" RB ISO AUTO TEST SELECT SWITCH "B"

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO SP-358A, SP-358B, OR SP-358C AS APPLICABLE, TO RESTORE AFFECTED SWITCH

DISCUSSION:

THIS ALARM INDICATES THAT ES SYSTEMS MAY NOT FUNCTION PROPERLY ON AN AUTOMATIC OR MANUAL ES ACTUATION.

REFERENCES: DRAWING 208-028 SHEET ESAB-06

SENSING ELEMENT: TS4/RCB, SS4/RCA, SS4/RBB