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INFORMATION ONLY

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ANNUNCIATOR RESPONSE AR-304 FLORIDA POWER CORPORATION CRYSTAL RIVER UNIT 3

ESD ANNUNCIATOR RESPONSE

DATE:

APPROVED BY: Interpretation Contact Frank Dale for MAT (SIGNATURE ON FILE)

12/3/97

INTERPRETATION CONTACT:

Manager, Nuclear Plant Operations Support

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ENCLOSURES

1 Annunciato	r Response
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1.0 PURPOSE

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- Establish a reference document for each Annunciator Window on the ES (B)-JH1 Lampbox.
- 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

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

ENCLOSURE 1 (Page 1 of 56)

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1	S	UAI	 V

EVENT POINT 0923

INDICATED CONDITION:	
o HPI ACTUATION "B"	
REDUNDANT INDICATION WHICH W	ILL VERIFY ALARM:
<pre>o RCS PRESSURE <500 PSIG o RB PRESSURE >4 PSIG o MANUAL ACTUATION OF HPI</pre>	ECTED CHANNELS CHANGE STATE
OPERATOR ACTIONS FOR A VALID	ALARM:
o REFER TO EOP	
DISCUSSION:	
OUT OF 3 HPI BI-STABLES TRI	AS ACTUATED, OR SHOULD HAVE ACTUATED BY EITHER 2 SPED OR BY THE CASCADE ACTUATION FROM LPI OR 4 SURE. UPON RECEIPT OF THIS ALARM ES SHOULD BLOCK
REFERENCES: DRAWING 208-028	SHEFT ESR-31
	,RC-2,/RC-3, ES ACTUATION RELAYS

ENCLOSURE 1 (Page 2 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-01-02	D-01-02

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	SEQUENCE
B	LOCK 2
ACT	UATION 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 .CTIONS 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

ENCLOSURE 1 (Page 3 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-01-03	D-01-03

LOAD	SEQUENCE
B	LOCK 3
ACT	UATION B

EVENT POINT 1025

INDICATED CONDITION:

o LOADING SEQUENCE BLOCK 3 ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

ES CHANNEL STATUS INDICATION
 LOSS OF POWER TO AN ES ACTUATION CHANNEL CABINET
 FAILURE OF AN ES CHANNEL SENSING ELEMENT
 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

ENCLOSURE 1 (Page 4 of 56)

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 EQUENCE
 ATION B

EVENT POINT 1026

INDICATED CONDI	TION:
o LOADING SEQU	JENCE BLOCK 4 ACTUATION "B"
REDUNDANT INDIC	ATION WHICH WILL VERIFY ALARM:
O LOSS OF POWE	STATUS INDICATION ER TO AN ES ACTUATION CHANNEL CABINET AN ES CHANNEL SENSING ELEMENT FESTING IN PROGRESS
OPERATOR ACTION O REFER TO EOP	S FOR A VALID ALARM:
DISCUSSION:	
	ED EITHER BY 2 OUT OF 3 HPI BI-STABLES TRIPPED OR BY THE ION FROM LPI OR 4# RB PRESSUPE AND ES EQUIPMENT STARTS
ONLY ONE OF TH POWER OR A SEN	E HPI ACTUATION RELAYS HAS ACTUATED, AN ES CABINET HAS LOST SING ELEMENT HAS FAILED AND ES EQUIPMENT IS NOT STARTING CK 4 ACTUATION THE HPI SEAL-IN RESET PUSH-BUTTON MUST BE
REFERENCES . DRA	WING 208-028 SHEET ESB-25
SENSING ELEMENT	: 62X3/RC-1, RC-2, RC-3 ES ACTUATION RELAYS

ENCLOSURE 1 (Page 5 of 56)

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LOAD SEQUEN	VCE
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

ENCLOSURE 1 (Page 6 of 56)

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	SEQUE	ACE
E	LOCK 6	
ACT	UATION	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 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 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

ENCLOSURE 1 (Page 7 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-02-01	D-02-01

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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: T. 1, 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-26
 CFV-27
 CFV-28
 CFV-29
 CFV-42
 MUV-49

 MSV-148
 WDV-4
 WDV-61
 WDV-62
 WDV-405
 DWV-160
 CFV-25 MSV-130 WDV-4 MUV-27 REFERENCES: DRAWING 208-028 SHEET ESB-55 SENSING ELEMENT: 63Z-4B ES ACTUATION RELAY

ENCLOSURE 1

(Page 8 of 56)

ESD ANNUNCIATOR RESPONSE

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HPI B
FLOW
HIGH/LOW

EVENT POINT 1069

INDICATED CONDITION:

o LOOP B1 HPI FLOW IS >263 GPM 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 ALARM:

REFER TO EOP-13 FOR HPI THROTTLING REQUIREMENTS
 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 SHEET MU-047



ENCLOSURE 1 (Page 9 of 56)

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	HPI FLO	-	
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EVENT POINT 1070

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

REFER TO EOP-13 FOR HPI THROTTLING REQUIREMENTS
 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

ENCLOSURE 1 (Page 10 of 56)

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EVENT POINT 1073

INDICATED CONDITION:

O LOOF 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 LOP-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

ENCLOSURE 1 (Page 11 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-02-02	D-02-02

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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 INDICA" ION 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

ENCLOSURE 1 (Page 12 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-02-03	D-02-03
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LPI (DHV-6) OPEN	
OFEN	

EVENT POINT 0218

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

DHV-6 INDICATION
 RCS PRESSURE INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

REFER TO EOP-08 IF ON LPI.
 IF ON DECAY HEAT REMOVAL THEN ENSURE PROPER DH FLOW PATH.
 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 ANL 33 AC (CLOSED LIMIT SWITCH FOR DHV-6)

ENCLOSURE 1 (Page 13 of 56)

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LP		
FLC		
HIGH	/LOV	N

EVENT POINT 0228

INDICATED CONDITION:

O DHP-1A FLOW >3750 GPM AS SENSED BY DH-1-FS2

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

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

DISCUSSI (4:

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

ENCLOSJRE 1 (Page 14 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-02-04	D-02-04
	LPI B FLOW	,
	HIGH/LC	

EVENT POINT 0230

INDICATED CONDITION:

o DHP-1B FLOW <2800 GPM AS SENSED BY DH-1-FS2 FOR >5 SEC COINCIDENT WITH LPI ACTUATION "B"

REDUNDANT DICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

RFFER TO EOP
 VERTION OF DHP-1B
 VERTY PROPER OPERATION OF DHV-111, "B" DECAY HEAT CONTROL VALVE.
 INCREASE FLOW BY EITHER THROTTLING DHV-111 OR DHV-6, OPEN.

DISCUSSION:

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REFERENCES: DRAWING 208-021 SHEET DH-24

SENSING ELEMENT: DH-1-FS2

ENCLOSURE 1 (Page 15 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-02-05	D-02-05
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AC	TUATION
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EVENT POINT 0930

INDICATED CONDITION:

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o RCS PRESSURE <1640 PSIG AND HPI NOT BYPASSED
o RCS PRESSURE <750 PSIG AND LPI NOT BYPASSED</pre>

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

RCS PRESSURE INDICATION
 ES STATUS LIGHTS INDICATE ES NOT BYPASSED

OPERATOR ACTIONS FOR A VALID ALARM:

 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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ESD-JH1-02-06

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:

RCS PRESSURE INDICATION
 ES STATUS LIGHTS INDICATE ES NOT RESET

OPERATOR ACTIONS FOR A VALID ALARM:

 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.

ARFERENCES: DRAWING 208-028 SHEET ESAB-06

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

ENCLOSURE 1 (Page 17 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-03-01	D-03-01

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LPI ES B ACTUATION

-

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:

RCS PRESSURE INDICATION
 RB PRESSURE INDICATION
 SS 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.

REFERENCES: DRAWING 208-028 SHEET ESB-42

SENSING ELEMENT: 6323 ES ACTUATION RELAY

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ESD ANNUNCIATOR	RESPONSE	ESD-JH1-03-02	D-03-02

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	PUMP TRIP	B	

EVENT POINT 0220

INDICATED CONDITION:

 DHP-1B 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-1B

OPERATOR ACTIONS FOR A VALID ALARM:

REFER TO EOP-11, LOSS OF DECAY HEAT REMOVAL
 PLACE "A" DECAY HEAT TRAIN IN SERVICE PER OP-404
 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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ENCLOSURE 1

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ESD	ANNUNCIATOR	RESPONSE	ESD-JH1-03-03	D-03-03	
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DH	PUMP B
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EVENT POINT 0224

INDICATED CONDITION:

6

O DHP-18 MOTOR AMPS >115% RATED LOAD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

- O REDUCE DHP 'S LOAD BY THROTTLING DHV-111 OR DHV-6
- O IF LOAD REMAINS HIGH ON DHP-1B 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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ENCLOSURE 1 (Page 20 of 56)

	Construction of Freedom and Construction of Co	
ESD ANNUNCIATOR RESPONSE	ESD-JH1-03-04	D-03-04

DH PUMP B OUT OF SERVICE

EVENT POINT 0222

INDICATED CONDITION:

O DHP-18 BREAKER IS RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

NO INDICATING LIGHTS ON CONTROL STATION
 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-18 BREAKER RELAY (52 H)

ENCLOSURE 1 (Page 21 of 56)

D-03-04

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ESD ANNUNCIATOR RESPONSE

DH PUMP B OUT OF SERVICE

ESD-JH1-03-04

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

OFERATOR ACTIONS FOR A VALID ALARM:

o VERIFY CLOSED DPDP-58 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)

ENCLOSURE 1 (Page 22 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-03-05	D-03-05

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EVENT POINT 0232

INDICATED CONDITION:

○ 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:

 VERIFY PROPER "B" DC SYSTEM OPERATION BY CHECKING DC SURGE TANK LEVEL, DC PUMP RUNNING AND DC CONTROL VALVES SETPOINT NORMAL.

- 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
- 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

ENCLOSURE 1 (Page 23 of 56)

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ESD ANNUNCIATOR	RESPONSE	ESD-JH1-03-06	D-03-06

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EVENT POINT 0226

INDICATED CONDITION:

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

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

DECAY HEAT FLOW INDICATOR, DH-1-FI2 INDICATES LOW FLOW
 DHP-1B CONTROL STATI'N AMP METER

OPERATOR ACTIONS FOR A VALID ALARM:

O INCREASE DHP-18 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
- 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	ESD-JH1-04-02	D-04-02
ESD ANNUNCIATUR RESPONSE	E20-141-04-05	0-04-02

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and the second	 	 	

DC PUMP	B
TRIP	-

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:

 IF DH SYSTEM IS OPERATING, CONSIDERATION SHOULD BE GIVEN TO ALTERNATING DECAY HEAT TRAINS FER OP-404

O INVESTIGATE DCP-18 PUMP, MOTOR, AND BREAKER

DISCUSSION:

DCP-18 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	ESD-JH1-04-03	D-04-03
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EVENT POINT 0201

INDICATED CONDITION:

O DCP-18 MOTOR AMPS >115% RATED LOAD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O DCP-18 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)

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

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DC	PUMP	B
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EVENT POINT 0211

INDICATED CONDITION:

O DCP-18 BREAKER IS RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

NO INDICATING LIGHTS ON DCP-1B CONTROL STATION
 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

ENCLOSURE 1 (Page 27 of 56)

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ESD ANNUNCIATOR RE	SPONSE	ESD-JH1-04-04	D-04-04

DC PUMP B OUT OF SERVICE

EVENT POINT 0213

INDICATED CONDITION:

O DCP-18 BREAKER HAS NO DC CONTROL POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

VERIFY CLOSED DPDP-5B SWITCH 9
 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

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ENCLOSURE 1 (Page 28 of 56)

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ESD ANNUNCIATOR	RESPONSE	ESD-JH1-04-05	D-04-05

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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:

- 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
- 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

ENCLOSURE 1 (Page 29 of 56)

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

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Lange and the second se	ELECTRON	 to bit the second second		

DC TANK B
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 FOR A VALID ALARM:

 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 EOP-11
- 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

ENCLOSURE 1 (Page 30 of 56)

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

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DC	TANK B
1	EVEL
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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-13

OPERATOR ACTIONS FOR A VALID ALARM:

O VERIFY AUTOMATIC DC SURGE TANK FILL VALVE, DCV-12 IS OPEN

HAVE AUX BLDG OPERATOR FILL DC SURGE TANK LOCALLY
 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

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ENCLOSURE 1 (Page 31 of 56)

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EVENT POINT 1877

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

LOOP VENT VALVE POSITION INDICATION IS OPEN ON MCB
 LOOP VENT VALVE FLOW WHITE INDICATING LIGHT IS ON
 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)

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ENCLOSURE 1 (Page 32 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-05-03	D-05-03
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EVENT POINT 0398

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

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

DISCUSSION:

AHF-153 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

ENCLOSURE 1 (Page 33 of 56)

ESD ANNUNCIATOR RESPONSE ESD-JH1-05-03 D-05-03

AH	FAN	1158
T	ROU	BLE

EVENT POINT 0399

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 CHEET AH-43

SENSING ELEMENT: CS/SC, CS/O, A4-408-DPS

ENCLOSURE 1 (Page 34 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-05-03	D-05-03

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EVENT POINT 0400

INDICATED CONDITION:

○ 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:

INVESTIGATE CAUSE OF HIGH DUCT TEMPERATURE
 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



ENCLOSURE 1 (Page 35 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-05-05	D-05-05

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EVENT POINT 0209

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O DCP-18 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-38 RUNNING

○ VERIFY RAW WATER DELTA TEMP FOR DHCCC HEAT EXCHANGER IS <10°</p>

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 OP 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



ENCLOSURE 1 (Page 36 of 56)

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

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BS/DH PUMP	B
DC FLOW	
LOW	

EVENT POINT 1221

INDICATED CONDITION:

O DECAY HEAT PUMP 1B DC FLOW IS <30 GPM ... S SENSED BY DC-68-FIS WITH DHP-1B BKR CLOSED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- O DHP-18 LOCAL DC FLOW INDICATOR INDICATES LOW FLOW
- O COMPUTER POINT X323 WHICH MONITORS DHP-18 MOTOR STATUR TEMP
- o COMPUTER GROUP 74

OPERATOR ACTIONS FOR A VALID ALARM:

ENSURE DCP-1B RUNNING
 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

ENCLOSURE 1 (Page 37 of 56)

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

BS/DH		
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EVENT POINT 1223

INDICATED CONDITION: O BUILDING SPRAY PUMP 1B 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 COMPUTER POINT X314 WHICH MONITORS BSP-1B MOTOR STATOR TEMP O COMPUTER POINTS X312 AND X313 WHICH MONITOR BSP-1B PUMP TEMPS 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 OR DCV-117 AS REQUIRED DISCUSSION: THE MAXIMUM ALLOWABLE BS PUMP STATOR TEMP IS 300° F. (149°C) CONSIDERATION SHOULD BE MADE IN SHUTTING DOWN THE PUMP IF THIS TEMP IS REACHED. DCV-34 AND DCV-117 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-74-FIS

ENCLOSURE 1 (Page 38 of 56)

ESU ANNUNCIATUK KESPUNSE ESU-JHI-UO	ESD ANNUNCIATOR RESPONSE ESD-JH1-06-02 D-	06-02
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DH RW PU TRIP	

EVENT POINT 0018

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

 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

ENCLOSURE 1 (Page 39 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-06-03	D-06-03
LOD ANNONCEATOR RESPONSE	1.20 Just 00 02	

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	PUMP
MC	TOR
OVE	RLOAD

EVENT POINT 0017

INDICATED CONDITION

o RWP-3B MOTOR AMPS ≥115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O HIGH RWP-38 MOTOR AMPS

o RWP-3B TRIPS

OPERATOR ACTIONS FOR A VALID ALARM:

O HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS

 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

ENCLOSURE 1 (Page 40 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-06-04	D-06-
	DH RW P	UMP B
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EVENT POINT 0016

INDICATED CONDITION:

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O RWP-3B BREAKER HAS NO DC CONTROL POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

VERIFY CLOSED DPDP-58 SWITCH 10
 VERIFY DC KNIFE SWITCH FOR RWP-38 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

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ENCLOSURE 1 (Page 41 of 56)

ESD-3H1-06-04	A-06-0
DH RW PUMP B OUT OF SERVICE	
	DH RW PUM

EVENT POINT 0019

INDICATED CONDITION:

à

O RWP-3B BREAKER IS RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FUR 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

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ENCLOSURE 1 (Page 42 of 56)

Advantage of the second secon	Approximation to a contraction of the property states are a second as a second state of the second states are a	are many representation of the state of the
ESD ANNUNCIATOR RESPONSE	ESD-JH1-06-05	D-06-05

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			NORTHING TO A		

DH RW	PUMP B
The second s	PRESS
	W

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-38 DISCHARGE PRESSURE INDICATOR, RW-8-PI

OPERATOR ACTIONS FOR A VALID ALARM:

MONITOR PUMP CONTROL STATION CURRENT METER
 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 208-050 SHEET RW-05

SENSING ELEMENT: CONTACT 525/a, RW-61-PS

ENCLOSURE 1 (Page 43 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-07-01	D-07-01

RB	ISOLATION
	ES B
	CTUATION

EVENT POINT 0932

INDICATED CONDITION:

4.1

o RB ISOLATION ACTUATION "B"

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o RB PRESSURE >4 PSIG

MANUAL ACTUATION OF RB ISOLATION AND COOLING
 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.

REFERENCES: DRAWING 208-029 SHEET ESB-57

SENSING ELEMENT: 63Z1/RB1, 63Z1/RB2, 63Z/RB3, OR 1X1F/RBB

ENCLOSURE 1 (Page 44 of 56)

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

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		 		TELEVISION	
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a according to the second second second		 			

PUMP	B	

EVENT POINT 1828

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

ENSURE AUTO START OF SWP-1A
 HAVE BREAKER CUBICLE CHECKED FOR DROPPED TARGETS
 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: 525/B, 52H/A, CS/SC, CS/O

ENCLOSURE 1

(Page 45 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-07-03	D-07-03
LOD ANTONCIATOR RESPONDE	600-3112-07-03	0 01 00

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C	VEF		

EVENT PCINT 1827

INDICATED CONDITION

* *

O SWP-18 MOTUR AMPS >115% RATED LOAD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

START SWP-1A
 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

ENCLOSURE 1 (Page 46 of 56)

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

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			and the second second	and the second second	and the second second	and the second second second

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EVENT POINT 1820

INDICATED CONDITION:

.

O SWP-18 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

(Page 47 of 56)

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

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				 CONTRACTOR OF CONTRACTOR	

SW	PUMP	B	
	OF SER		1

EVENT POINT 1854

INDICATED CONDITION:

O SWP-18 BREAKER HAS NO DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

VERIFY DC KNIFE SWITCH FOR SWP-1B BREAKER CLOSED.
 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 BREAKEF 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-18



ENCLOSURE 1 (Page 48 of 56)

ESD ANNUNCIATOR RESPONSE ES	D-JH1-07-05	D-07-05

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SW P	

EVENT POINT 1829

INDICATED CONDITION:

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O SWP-1B 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:

VERIFY ADEQUATE SW PUMP DISCHARGE PRESSURE SW-2-PI
 INVESTIGATE THE CAUSE OF SWP-1B 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, C5/ST, CS/O

ENCLOSURE 1 (Page 49 of 56)

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ESD ANNUNCIATOR RESPONSE	ESD-JH1-07-06	D-07-06

		and a second	1.0.1	

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LOCKED OUT

EVENT POINT 1899

INDICATED CONDITION:

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o SWP-1B IN PULL-TO-LOCK POSITION

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O SWP-18 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

ENCLOSURE 1 (Page 50 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-08-01	D-08-01
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	and a rest from a state, it as			

EVENT POINT 1915

INDICATED CONDITION:

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O RWP-2B CONTROL HANDLE IN PULL-TO-LOCK POSITION

REDUNDANT INDICA AUN TO "Y WILL VERIFY ALARM:

O RWP-2B CONTROL HANDLE ON MCB

OPERATOR ACTIONS FOR A VALID ALARM:

O REFER TO AP-330

DISCUSSION:

REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: CB-ESFB-ML4

ENCLOSURE 1 (Page 51 of 56)

ESD ANNUNCIATOR RESPONSE

ESD-JH1-08-02 D-08-02

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SW RW PUMP	B
TRIF	

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:

START RWP-2A
 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 P'OPER FLOW PATH IS AVAILABLE PRIOR TO STARTING RWP-2A.

REFER TO TS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-050 SHEET RW-03

SENSING ELEMENT: 525/B, 52H/A, CS/SC, CS/O

ENCLOSURE 1 (Page 52 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-08-03	D-08-03
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SW RW P	
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EVENT POINT 0009

INDICATED CONDITION

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O RWP-28 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:

START RWP-2A
 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 208-050 SHEET RW-03

SENSING ELEMENT: RELAY 51

ENCLOSURE 1 (Page 53 of 56)

ESD ANNUNCIATOR RESPONSE ESD-JI	H1-08-04 D-08-04	
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 				N. SAMON ST

		PUMP	-
001	OF	SERVIC	E

EVENT POINT 0008

INDICATED CONDITION:

O RWP-2B BREAKER HAS NO DC CONTROL POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

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

OPERATOR ACTIONS FOR A VALID ALARM:

VERIFY CLOSED DPDP-5B SWITCH 10
 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)

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ESD ANNUNCIATOR RESPONSE	ESD-3M1-08-04	D-08-04

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		and the second s				
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						LE SALESSAN

SW RW PUMP B OUT OF SERVICE

EVENT POINT 0023

INDICATED CONDITION:

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O BREAKER FOR RWP-2B BREAKER IS RACKED OUT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

NO INDICATING LIGHTS ON RWP-2B CONTROL STATION
 NO ES STATUS INDICATION FOR RWP-2B

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 RW-03

SENSING ELEMENT: CONTACT 52H/b IN BREAKER CUBICLE FOR RWP-2B

ENCLOSURE 1 (Page 55 of 56)

ESD ANNUNCIATOR RESPONSE	ESD-JH1-08-05	D-08-05
LOD ANNONCLAIOR REDIVIDE	Lov 362 00 00	0 00 00

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	VRW			
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EVENT POINT 0011

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

O RWP-28 RED INDICATING LIGHT WITH A GREEN FLAG ON THE CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

VERIFY RW PUMP DISCHARGE PRESSURE RW-23-PI
 IN/ESTIGATE 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

ENCLOSURE 1 (Page 56 of 56)

ESD A	NNUNCIATOR RESPONSE	ESD-JH1-08-06	D-08-06

protection. The contract of the second se		provence de la construcción de la c	personal sectors of the sector

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:

 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
