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DATE: 13 Apr 1993
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DOCUMENT NUMBER	SHEET NUMBER	REVISION NUMBER	COPY NUMBER
AR 601		07	24
AR 602		12	24
AR 603		09	24
AR 702		12	24

INSTRUCTIONS TO THE ADDRESSEE

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___ (5) SIGN BELOW INDICATING THAT YOU HAVE READ AND UNDERSTOOD THE CHANGES AS IDENTIFIED
_X_ (6) RETURN TO DOCUMENT CONTROL, CRYSTAL RIVER UNIT 3, MAC# NA1C___
NR2A_X_ SA1G___ FLORIDA POWER CORP., P.O. BOX 219
CRYSTAL RIVER FLA. 32623
___ (7) QUALITY PROGRAMS PERSONNEL HAVE READ AND UNDERSTOOD THE CHANGES TO THE AFFECTED QAP'S

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INDEPENDENT VERIFICATION _____ DATE _____ (OPS)

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Rev. 7 04/07/93

Effective Date 4/13/93

Document Section
INFORMATION ONLY
C. R. Nuclear

OPERATING PROCEDURE

AR-601

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

TGF M ANNUNCIATOR RESPONSE

THIS PROCEDURE ADDRESSES SAFETY RELATED COMPONENTS

APPROVED BY: Interpretation Contact

W. Marshall

DATE: 4/15/93

INTERPRETATION CONTACT: Manager, Nuclear Plant Operations

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ENCLOSURE

1	Annunciator Response	2

1.0 PURPOSE

1.1 Establish a reference document for each Annunciator Window on the TGF-AX1 Lampbox.

1.2 Establish operator actions for valid Annunciator alarms on the TGF-AX1 Lampbox.

1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the TGF-AX1 Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

2.1.1 OP-604, Circulating Water System

2.1.2 OP-416, Domestic Water Supply System

2.1.3 AP-1050, Flooding

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-224-049

3.0 PERSONNEL INDOCTRINATION

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

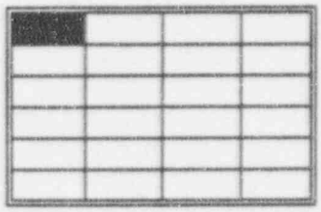
4.0 INSTRUCTIONS

4.1 Respond to alarms on the TGF-AX1 Lampbox as indicated on Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP ACTIONS

None

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-01-01	M-01-01



CW PUMP A TRIP

EVENT POINT 0122

INDICATED CONDITION:

o CWP-1A BREAKER OPEN AND CONTROL HANDLE IN NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o GREEN LIGHT IS ON WITH A RED FLAG ON CWP-1A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o MONITOR CONDENSER VACUUM.
o CLOSE ARV-47.
o VERIFY ON LINE SC HEAT EXCHANGER IS BEING SUPPLIED BY AN ON LINE CWP.
o REDUCE PLANT POWER AS NECESSARY TO MAINTAIN CONDENSER VACUUM.

DISCUSSION:

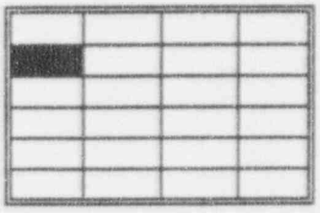
DO NOT CONTINUE TO OPERATE THE TURBINE WHEN BOTH CIRC WATER PUMPS ARE SHUTDOWN IN THE SAME CONDENSER.

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-018 SHEET CW-01

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-01-02	M-01-02



CW PUMP A MOTOR OVERLOAD

EVENT POINT 0121

INDICATED CONDITION:

o CWP-1A MOTOR **AMPS** >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1A LOAD INDICATOR.
o LOCAL CWP-1A AMP METER.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CWP-1A FOR SIGNS OF ABNORMAL OPERATION.
o CHECK BREAKER CUBICLE FOR DROPPED TARGETS.

DISCUSSION:

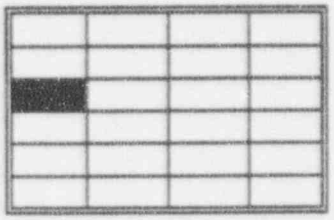
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-018 SHEET CW-01

SENSING ELEMENT: BREAKER OVERLOAD CONTACTS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-01-03	M-01-03



CW PUMP VIBRATION HIGH

EVENT POINT 2040

INDICATED CONDITION:

o CIRCULATING WATER PUMPS VIBRATION MONITOR IN ALARM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o RED ALARM LIGHT IS ON, LOCATED ON THE LOCAL ALARM PANEL, INTAKE AREA.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF CW PUMPS.
o REFER TO OP-604.

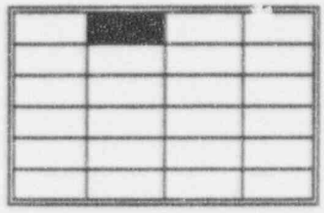
DISCUSSION:

THIS ALARM INDICATES ANY ONE OF 8 CIRC PUMP VIBRATION MONITORS IS IN ALARM ONCE THIS ALARM IS IN, ANOTHER VIBRATION ALARM COMING IN WILL NOT REFLASH THE WINDOW.

REFERENCES: VENDOR DRAWINGS FOR CIRC PUMP VIBRATION MODULE.

SENSING ELEMENT: CW-156-ME, CW-157-ME, CW-158-ME, CW-159-ME

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-01	M-02-01



CW PUMP B TRIP

EVENT POINT 0126

INDICATED CONDITION:

o CWP-1B BREAKER OPEN AND CONTROL HANDLE IN NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o GREEN LIGHT IS ON WITH A RED FLAG ON CWP-1B CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o MONITOR CONDENSER VACUUM.
o CLOSE ARV-46.
o VERIFY ON LINE SC HEAT EXCHANGER IS BEING SUPPLIED BY AN ON LINE CWP.
o REDUCE PLANT POWER AS NECESSARY TO MAINTAIN CONDENSER VACUUM.

DISCUSSION:

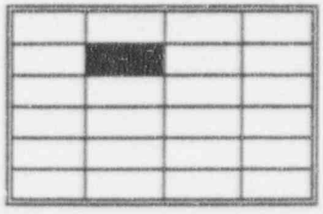
DO NOT CONTINUE TO OPERATE THE TURBINE WHEN BOTH CIRC WATER PUMPS ARE SHUTDOWN IN THE SAME CONDENSER.

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-018 SHEET CW-02

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-02	M-02-02



CW PUMP B MOTOR OVERLOAD

EVENT POINT 0125

INDICATED CONDITION:

o CIRC WATER PUMP 1B MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1B CURRENT INDICATOR.
o LOCAL CWP-1B AMMETER.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CWP-1B FOR SIGNS OF ABNORMAL OPERATION.
o CHECK BREAKER CUBICLE FOR DROPPED TARGETS.

DISCUSSION:

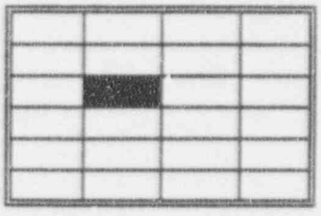
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-018 SHEET CW-02

SENSING ELEMENT: BREAKER OVERLOAD CONTACTS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0123

INDICATED CONDITION:

o CIRC WATER PUMP 1A DISCHARGE PRESSURE **<4 PSIG** AS SENSED BY CW-57-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HIGH LEVEL ALARM FOR CDP-1A/B PIT AND/OR TURBINE BUILDING SUMP.
o INTAKE AREA LOCAL CWP-1A DISCHARGE PRESSURE GAUGE.
o LOCAL WATERBOX INLET PRESSURE GAUGE.

OPERATOR ACTIONS FOR A VALID ALARM:

o CHECK CDP-1A/B PIT AND TURBINE BUILDING SUMP LEVELS ARE NOT HIGH.
o IF TURBINE BUILDING FLOODING IS INDICATED REFER TO AP-1050.
o VERIFY PROPER INTAKE OPERATION.
o WASH SCREENS AS NECESSARY.
o CLEAN BAR RACKS.

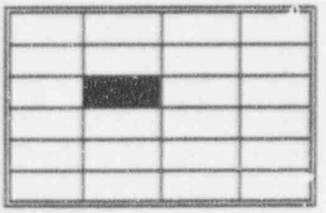
DISCUSSION:

THIS ALARM INDICATES CWP-1A IS EITHER NOT PUMPING WATER, OR A LARGE LEAK HAS DEVELOPED WHICH COULD BE FLOODING THE TURBINE BUILDING. CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN CWP-1A.

REFERENCES: DRAWING 208-018 SHEET CW-01

SENSING ELEMENT: CW-57-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0127

INDICATED CONDITION:

o CIRC WATER PUMP 1B DISCHARGE PRESSURE **<4 PSIG** AS SENSED BY CW-58-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HIGH LEVEL ALARM FOR CDP-1A/B PIT AND/OR TURBINE BUILDING SUMP.
o INTAKE AREA LOCAL CWP-1B DISCHARGE PRESSURE GAUGE.
o LOCAL WATERBOX INLET PRESSURE GAUGE.

OPERATOR ACTIONS FOR A VALID ALARM:

o CHECK CDP-1A/B PIT AND TURBINE BUILDING SUMP LEVELS ARE NOT HIGH.
o IF TURBINE BUILDING FLOODING IS INDICATED REFER TO AP-1050.
o VERIFY PROPER INTAKE OPERATION.
o WASH SCREENS AS NECESSARY.
o CLEAN BAR RACKS.

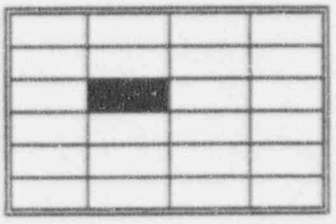
DISCUSSION:

THIS ALARM INDICATES CWP-1B IS EITHER NOT PUMPING WATER, OR A LARGE LEAK HAS DEVELOPED WHICH COULD BE FLOODING THE TURBINE BUILDING. CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN CWP-1B.

REFERENCES: DRAWING 208-018 SHEET CW-02

SENSING ELEMENT: CW-58-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



CW PUMP DISCH PRESS HIGH/LOW

EVENT POINT 0131

INDICATED CONDITION:

o CIRC WATER PUMP 1C DISCHARGE PRESSURE **<4 PSIG** AS SENSED BY CW-59-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HIGH LEVEL ALARM FOR CDP-1A/B PIT AND/OR TURBINE BUILDING SUMP.
o INTAKE AREA LOCAL CWP-1C DISCHARGE PRESSURE GAUGE.
o LOCAL WATERBOX INLET PRESSURE GAUGE.

OPERATOR ACTIONS FOR A VALID ALARM:

o CHECK CDP-1A/B PIT AND TURBINE BUILDING SUMP LEVELS ARE NOT HIGH.
o IF TURBINE BUILDING FLOODING IS INDICATED REFER TO AP-1050.
o VERIFY PROPER INTAKE OPERATION.
o WASH SCREENS AS NECESSARY.
o CLEAN BAR RACKS.

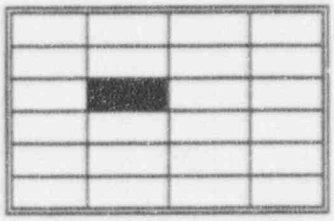
DISCUSSION:

THIS ALARM INDICATES CWP-1C IS EITHER NOT PUMPING WATER, OR A LARGE LEAK HAS DEVELOPED WHICH COULD BE FLOODING THE TURBINE BUILDING. CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN CWP-1C.

REFERENCES: DRAWING 208-018 SHEET CW-03

SENSING ELEMENT: CW-59-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0135

INDICATED CONDITION:

o CIRC WATER PUMP 1D DISCHARGE PRESSURE **<4 PSIG** AS SENSED BY CW-60-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o HIGH LEVEL ALARM FOR CDP-1A/B PIT AND/OR TURBINE BUILDING SUMP.
o INTAKE AREA LOCAL CWP-1D DISCHARGE PRESSURE GAUGE.
o LOCAL WATERBOX INLET PRESSURE GAUGE.

OPERATOR ACTIONS FOR A VALID ALARM:

o CHECK CDP-1A/B PIT AND TURBINE BUILDING SUMP LEVELS ARE NOT HIGH.
o IF TURBINE BUILDING FLOODING IS INDICATED REFER TO AP-1050.
o VERIFY PROPER INTAKE OPERATION.
o WASH SCREENS AS NECESSARY.
o CLEAN BAR RACKS.

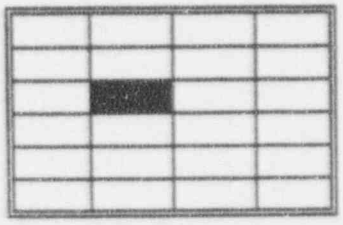
DISCUSSION:

THIS ALARM INDICATES CWP-1D IS EITHER NOT PUMPING WATER, OR A LARGE LEAK HAS DEVELOPED WHICH COULD BE FLOODING THE TURBINE BUILDING. CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN CWP-1D.

REFERENCES: DRAWING 208-018 SHEET CW-04

SENSING ELEMENT: CW-60-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0137

INDICATED CONDITION:

o CIRC WATER PUMP 1A DISCHARGE PRESSURE **>25 PSIG** AS SENSED BY CW-57-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM: .

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER INTAKE OPERATION.
o BACKWASH DEBRIS FILTERS AS NECESSARY.
o CHECK INTAKE AREA LOCAL CWP-1A DISCHARGE PRESSURE GAUGE AND 95' ELEVATION TB LOCAL WATERBOX INLET PRESSURE GAUGE.

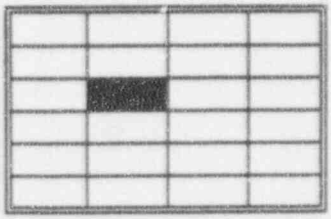
DISCUSSION:

THIS ALARM INDICATES CWP-1A IS PUMPING AGAINST SOME KIND OF FLOW RESTRICTION. THIS COULD BE, CLOGGED DEBRIS FILTERS OR DIRTY WATERBOX. IF A HIGH WATERBOX INLET PRESSURE EXISTS THEN A CLOGGED WATERBOX MAY BE INDICATED. CONSIDERATION SHOULD BE GIVEN TO REMOVING THE WATERBOX FROM SERVICE AND CLEANING THE BOX.
AN 11 PSID DIFFERENTIAL PRESSURE BETWEEN WATERBOX INLET AND OUTLET IS CONSIDERED A DIRTY BOX.

REFERENCES: DRAWING 208-018 SHEET CW-01

SENSING ELEMENT: CW-57-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0138

INDICATED CONDITION:

o CIRC WATER PUMP 1B DISCHARGE PRESSURE **>25 PSIG** AS SENSED BY CW-58-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER INTAKE OPERATION.
o BACKWASH DEBRIS FILTERS AS NECESSARY.
o CHECK INTAKE AREA LOCAL CWP-1B DISCHARGE PRESSURE GAUGE AND 95' ELEVATION TB LOCAL WATERBOX INLET PRESSURE GAUGE.

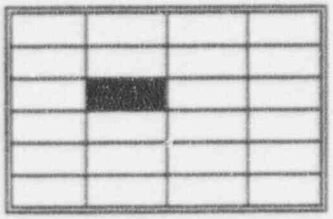
DISCUSSION:

THIS ALARM INDICATES CWP-1B IS PUMPING AGAINST SOME KIND OF FLOW RESTRICTION. THIS COULD BE, CLOGGED DEBRIS FILTERS OR DIRTY WATERBOX. IF A HIGH WATERBOX INLET PRESSURE EXISTS THEN A CLOGGED WATERBOX MAY BE INDICATED. CONSIDERATION SHOULD BE GIVEN TO REMOVING THE WATERBOX FROM SERVICE AND CLEANING THE BOX.
AN 11 PSID DIFFERENTIAL PRESSURE BETWEEN WATERBOX INLET AND OUTLET IS CONSIDERED A DIRTY BOX.

REFERENCES: DRAWING 208-018 SHEET CW-02

SENSING ELEMENT: CW-58-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0139

INDICATED CONDITION:

o CIRC WATER PUMP 1C DISCHARGE PRESSURE **>25 PSIG** AS SENSED BY CW-59-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER INTAKE OPERATION.
o BACKWASH DEBRIS FILTERS AS NECESSARY.
o CHECK INTAKE AREA LOCAL CWP-1C DISCHARGE PRESSURE GAUGE AND 95' ELEVATION TB LOCAL WATERBOX INLET PRESSURE GAUGE.

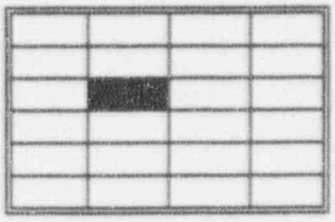
DISCUSSION:

THIS ALARM INDICATES CWP-1C IS PUMPING AGAINST SOME KIND OF FLOW RESTRICTION. THIS COULD BE, CLOGGED DEBRIS FILTERS OR DIRTY WATERBOX. IF A HIGH WATERBOX INLET PRESSURE EXISTS THEN A CLOGGED WATERBOX MAY BE INDICATED. CONSIDERATION SHOULD BE GIVEN TO REMOVING THE WATERBOX FROM SERVICE AND CLEANING THE BOX.
AN 11 PSID DIFFERENTIAL PRESSURE BETWEEN WATERBOX INLET AND OUTLET IS CONSIDERED A DIRTY BOX.

REFERENCES: DRAWING 208-018 SHEET CW-03

SENSING ELEMENT: CW-59-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-03	M-02-03



**CW PUMP
DISCH PRESS
HIGH/LOW**

EVENT POINT 0140

INDICATED CONDITION:

o CIRC WATER PUMP 1D DISCHARGE PRESSURE **>25 PSIG** AS SENSED BY CW-60-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER INTAKE OPERATION.
o BACKWASH DEBRIS FILTERS AS NECESSARY.
o CHECK INTAKE AREA LOCAL CWP-1D DISCHARGE PRESSURE GAUGE AND 95' ELEVATION TB LOCAL WATERBOX INLET PRESSURE GAUGE.

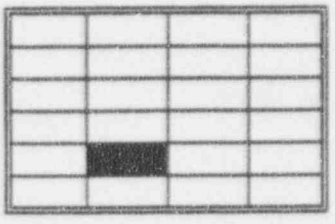
DISCUSSION:

THIS ALARM INDICATES CWP-1D IS PUMPING AGAINST SOME KIND OF FLOW RESTRICTION. THIS COULD BE, CLOGGED DEBRIS FILTERS OR DIRTY WATERBOX. IF A HIGH WATERBOX INLET PRESSURE EXISTS THEN A CLOGGED WATERBOX MAY BE INDICATED. CONSIDERATION SHOULD BE GIVEN TO REMOVING THE WATERBOX FROM SERVICE AND CLEANING THE BOX.
AN 11 PSID DIFFERENTIAL PRESSURE BETWEEN WATERBOX INLET AND OUTLET IS CONSIDERED A DIRTY BOX.

REFERENCES: DRAWING 208-018 SHEET CW-04

SENSING ELEMENT: CW-60-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0141

INDICATED CONDITION:

- o DIFFERENTIAL LEVEL ACROSS THE TRAVELING SCREENS >10" WATER AS SENSED BY CW-125,126,127,128 OR 129-LIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o ALL SCREEN WASH PUMPS AND ALL TRAVELING SCREENS AUTO START.
- o WATERFALL CONDITIONS EXIST ACROSS THE TRAVELING SCREENS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY ALL SCREEN WASH PUMPS AND TRAVELING SCREENS START.
- o REFER TO OP-604.

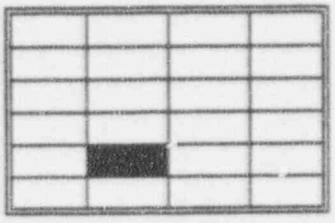
DISCUSSION:

ANY ONE LEVEL SWITCH ACROSS THE SCREENS WILL AUTO START ALL SCREENS AND SPRAY PUMPS.
AN "AUTO START RESET" PUSHBUTTON MUST BE DEPRESSED IN THE INTAKE MCC TO ALLOW SHUTTING DOWN THE SCREENS AND PUMPS.

REFERENCES: DRAWING 208-018 SHEET CW-09

SENSING ELEMENT: 3DL-5 RELAY

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0142

INDICATED CONDITION:

- o SCREEN WASH HEADER PRESSURE <70 PSIG FOR >10 SEC **AND** DIFFERENTIAL LEVEL ACROSS THE TRAVELING SCREENS >10" H_2O AS SENSED BY CW-53-PS, AND CW-125,126,127,128, OR 129-LIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o ALL SCREEN WASH PUMPS AUTO START.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY ALL SCREEN WASH PUMPS ARE RUNNING.
- o VERIFY WATERFALL CONDITIONS EXIST ACROSS THE TRAVELING SCREENS.
- o REFER TO OP-604.

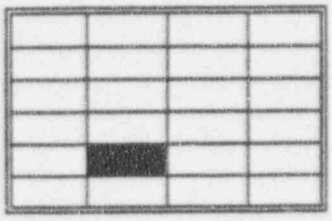
DISCUSSION:

ANY ONE LEVEL SWITCH ACROSS THE SCREENS WILL AUTO START ALL SCREENS AND SPRAY PUMPS.
AN "AUTO START RESET" PUSHBUTTON MUST BE DEPRESSED IN THE INTAKE MCC TO ALLOW SHUTTING DOWN THE SCREENS AND PUMPS.

REFERENCES: DRAWING 208-018 SHEET CW-10

SENSING ELEMENT: CW-53-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0143

INDICATED CONDITION:

o SCREEN WASH PUMP 2A, MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-2A RUNNING HOT.
o CWP-2A TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF CWP-2A MOTOR OVERLOAD.
o NOTIFY ELECTRIC SHOP.

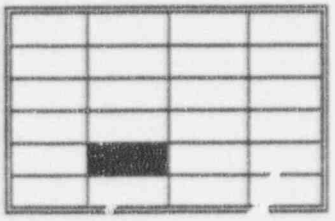
DISCUSSION:

RUNNING SCREEN WASH PUMPS FOR EXTENDED PERIODS OF TIME UNDER HIGH FLOW CONDITIONS CAN CAUSE SCREEN WASH PUMPS TO TRIP ON OVERLOAD.

REFERENCES: DRAWING 208-018 SHEET CW-10

SENSING ELEMENT: 49X OVERLOAD RELAY

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0144

INDICATED CONDITION:

- o SCREEN WASH PUMP 2B, MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWP-2B RUNNING HOT.
- o CWP-2B TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWP-2B MOTOR OVERLOAD.
- o NOTIFY ELECTRIC SHOP.

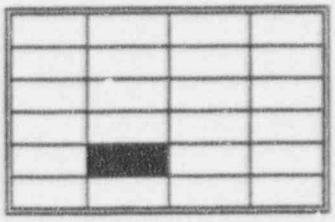
DISCUSSION:

RUNNING SCREEN WASH PUMPS FOR EXTENDED PERIODS OF TIME UNDER HIGH FLOW CONDITIONS CAN CAUSE SCREEN WASH PUMPS TO TRIP ON OVERLOAD.

REFERENCES: DRAWING 208-018 SHEET CW-11

SENSING ELEMENT: 49X OVERLOAD RELAY

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0145

INDICATED CONDITION:

- o SCREEN WASH PUMP 2C, MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWP-2C RUNNING HOT.
- o CWP-2C TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWP-2C MOTOR OVERLOAD.
- o NOTIFY ELECTRIC SHOP.

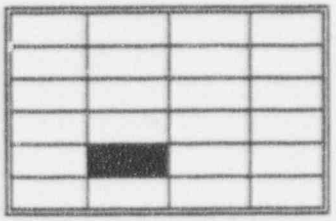
DISCUSSION:

RUNNING SCREEN WASH PUMPS FOR EXTENDED PERIODS OF TIME UNDER HIGH FLOW CONDITIONS CAN CAUSE SCREEN WASH PUMPS TO TRIP ON OVERLOAD.

REFERENCES: DRAWING 208-018 SHEET CW-12

SENSING ELEMENT: 49X OVERLOAD RELAY

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0148

INDICATED CONDITION:

- o CWTS-1A NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1A SHEER PIN FAILURE AS SENSED BY CW-138-KS.
- o CWTS-1A TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1A NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1A NOT RUNNING.
- o START CWTS-1A AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

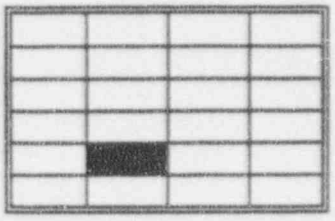
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-14

SENSING ELEMENT: 42/1CR, 42/3CR, 3CWTS-1A, 2CWTS-1A

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0149

INDICATED CONDITION:

- o CWTS-1B NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1B SHEER PIN FAILURE AS SENSED BY CW-139-KS.
- o CWTS-1B TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1B NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1B NOT RUNNING.
- o START CWTS-1B AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

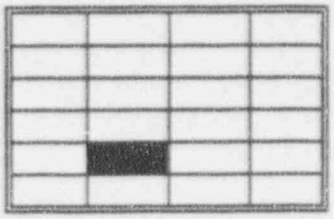
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-15

SENSING ELEMENT: 42/5CR, 42/7CR, 3CWTS-1B, 2CWTS-1B

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0150

INDICATED CONDITION:

- o CWTS-1C NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1C SHEER PIN FAILURE AS SENSED BY CW-140-KS.
- o CWTS-1C TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1C NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1C NOT RUNNING.
- o START CWTS-1C AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

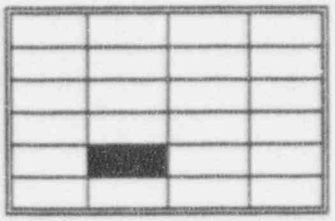
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-16

SENSING ELEMENT: 42/9CR, 42/11CR, 3CWTS-1C, 2CWTS-1C

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0151

INDICATED CONDITION:

- o CWTS-1D NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1D SHEER PIN FAILURE AS SENSED BY CW-141-KS.
- o CWTS-1D TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1D NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1D NOT RUNNING.
- o START CWTS-1D AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

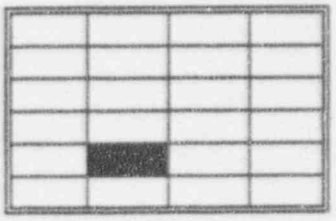
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-17

SENSING ELEMENT: 42/13CR, 42/15CR, 3CWTS-1D, 2CWTS-1D

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0152

INDICATED CONDITION:

- o CWTS-1E NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1E SHEER PIN FAILURE AS SENSED BY CW-142-KS.
- o CWTS-1E TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1E NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1E NOT RUNNING.
- o START CWTS-1E AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

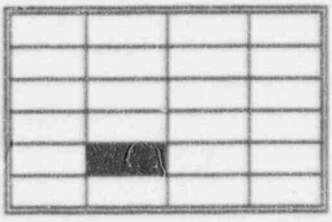
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-18

SENSING ELEMENT: 42/17CR, 42/19CR, 3CWTS-1E, 2CWTS-1E

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH
TROUBLE

EVENT POINT 0153

INDICATED CONDITION:

- o CWTS-1F NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1F SHEER PIN FAILURE AS SENSED BY CW-143-KS.
- o CWTS-1F TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1F NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1F NOT RUNNING.
- o START CWTS-1F AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

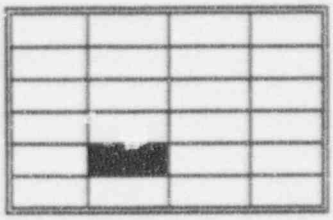
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-19

SENSING ELEMENT: 42/21CR, 42/23CR, 3CWTS-1F, 2CWTS-1F

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0154

INDICATED CONDITION:

- o CWTS-1G NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-1G SHEER PIN FAILURE AS SENSED BY CW-144-KS.
- o CWTS-1G TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-1G NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-1G NOT RUNNING.
- o START CWTS-1G AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

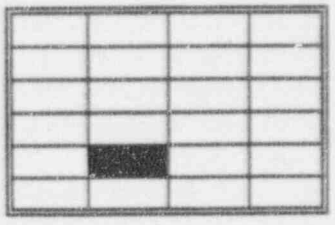
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.

REFERENCES: DRAWING 208-018 SHEET CW-20

SENSING ELEMENT: 42/25CR, 42/27CR, 3CWTS-1G, 2CWTS-1G

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH
TROUBLE

EVENT POINT 0155

INDICATED CONDITION:

- o CWTS-2 NOT RUNNING AND >10" DIFFERENTIAL LEVEL ACROSS SCREENS FOR >10 SECONDS.
- o CWTS-2 SHEER PIN FAILURE AS SENSED BY CW-145-KS.
- o CWTS-2 TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CWTS-2 NOT RUNNING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF CWTS-2 NOT RUNNING.
- o START CWTS-2 AS REQUIRED.
- o NOTIFY ELECTRIC SHOP.

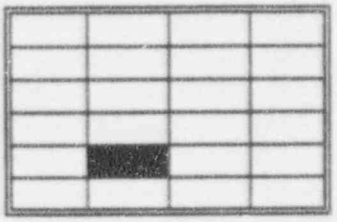
DISCUSSION:

TO CLEAR THESE ALARMS THE STOP PUSHBUTTON MUST BE DEPRESSED, OR SCREEN WASH HEADER PRESSURE MUST DROP BELOW 70 PSIG.
CWTS-2 IS THE NUCLEAR SERVICES RAW WATER TRAVELING SCREEN.

REFERENCES: DRAWING 208-018 SHEET CW-21

SENSING ELEMENT: 42/29CR, 42/31CR, 3CWTS-2, 2CWTS-2

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-02-05	M-02-05



SCREEN WASH TROUBLE

EVENT POINT 0156

INDICATED CONDITION:

o AIR SUPPLY TO INTAKE SCREENS CONTROL AND DIFFERENTIAL LEVEL INDICATING SYSTEMS **<60 PSIG** AS SENSED BY CW-124-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL AIR PRESSURE INDICATORS.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF LOSS OF AIR PRESSURE.

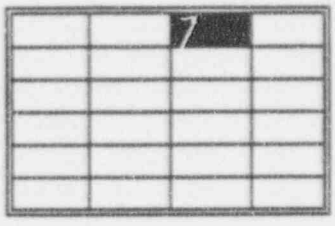
DISCUSSION:

THIS AIR SUPPLIES ALL AUTO START FUNCTIONS FOR THE SCREENS AND THE SCREEN WASH PUMPS.

REFERENCES: DRAWING 208-018 SHEET CW-23

SENSING ELEMENT: CW-124-PS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-01	M-03-01



CW PUMP C TRIP

EVENT POINT 0130

INDICATED CONDITION:

o CWP-1C BRE[illegible] OPEN AND CONTROL HANDLE IN NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o GREEN LIGHT IS ON WITH A RED FLAG ON CWP-1C CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o MONITOR CONDENSER VACUUM.
o CLOSE ARV-45.
o VERIFY ON LINE SC HEAT EXCHANGER IS BEING SUPPLIED BY AN ON LINE CWP.
o REDUCE PLANT POWER AS NECESSARY TO MAINTAIN CONDENSER VACUUM.

DISCUSSION:

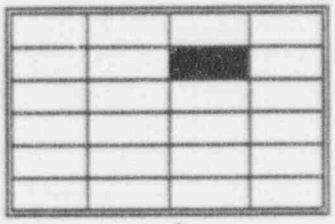
DO NOT CONTINUE TO OPERATE THE TURBINE WHEN BOTH CIRC WATER PUMPS ARE SHUTDOWN IN THE SAME CONDENSER.

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-018 SHEET CW-03

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-02	M-03-02



CW PUMP C
MOTOR
OVERLOAD

EVENT POINT 0129

INDICATED CONDITION:

o CWP-1C MOTOR AMPS >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1C CURRENT INDICATOR.
o LOCAL CWP-1C AMMETER.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CWP-1C FOR SIGNS OF ABNORMAL OPERATION.
o CHECK BREAKER CUBICLE FOR DROPPED TARGETS.

DISCUSSION:

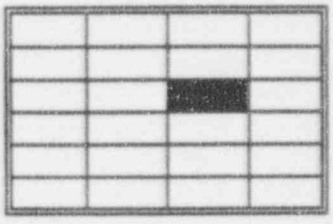
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-018 SHEET CW-03

SENSING ELEMENT: BREAKER OVERLOAD CONTACTS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-03	M-03-03



**CW PUMP
LUBE FLOW
LOW**

EVENT POINT 0124

INDICATED CONDITION:

o CWP-1A UPPER BEARING LUBE WATER FLOW <6 GPM AS SENSED BY DO-5-FIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1A WHITE "LUBE WTR FLOW NORM" PERMISSIVE LIGHT NOT ON.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF LOW FLOW.
o REFER TO OP-416 AND INCREASE COOLING WATER FLOW TO CWP-1A

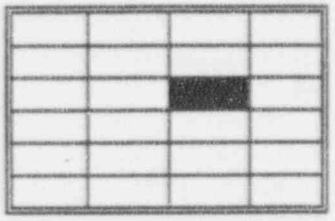
DISCUSSION:

LOW LUBE WATER FLOW OPERATION OF THE CIRC WATER PUMP SHOULD BE MINIMIZED TO PRECLUDE DAMAGE TO RUBBER BEARINGS OF THE PUMP SHAFT. IF ADEQUATE FLOW CANNOT BE RESTORED CONSIDER SHUTTING DOWN THE PUMP.

REFERENCES: DRAWING 208-018 SHEET CW-01

SENSING ELEMENT: DO-5-FIS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-03	M-03-03



CW PUMP
LUBE FLOW
LOW

EVENT POINT 0128

INDICATED CONDITION:

o CWP-1B UPPER BEARING LUBE WATER FLOW **<6 GPM** AS SENSED BY DO-7-FIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1B WHITE "LUBE WTR FLOW NORM" PERMISSIVE LIGHT NOT ON.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF LOW FLOW.
o REFER TO OP-416 AND INCREASE COOLING WATER FLOW TO CWP-1B.

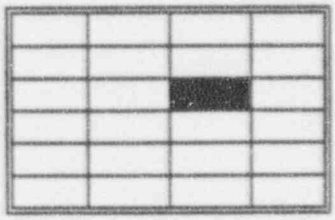
DISCUSSION:

LOW LUBE WATER FLOW OPERATION OF THE CIRC WATER PUMP SHOULD BE MINIMIZED TO PRECLUDE DAMAGE TO RUBBER BEARINGS OF THE PUMP SHAFT. IF ADEQUATE FLOW CANNOT BE RESTORED CONSIDER SHUTTING DOWN THE PUMP.

REFERENCES: DRAWING 208-018 SHEET CW-02

SENSING ELEMENT: DO-7-FIS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-03	M-03-03



CW PUMP
LUBE FLOW
LOW

EVENT POINT 0132

INDICATED CONDITION:

o CWP-1C UPPER BEARING LUBE WATER FLOW **<6 GPM** AS SENSED BY DO-9-FIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1C WHITE "LUBE WTR FLOW NORM" PERMISSIVE LIGHT NOT ON.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF LOW FLOW.
o REFER TO OP-416 AND INCREASE COOLING WATER FLOW TO CWP-1C.

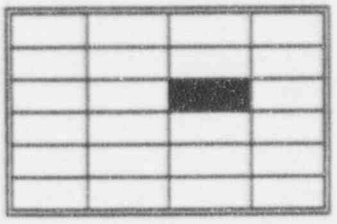
DISCUSSION:

LOW LUBE WATER FLOW OPERATION OF THE CIRC WATER PUMP SHOULD BE MINIMIZED TO PRECLUDE DAMAGE TO RUBBER BEARINGS OF THE PUMP SHAFT. IF ADEQUATE FLOW CANNOT BE RESTORED CONSIDER SHUTTING DOWN THE PUMP.

REFERENCES: DRAWING 208-018 SHEET CW-03

SENSING ELEMENT: DO-9-FIS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-03	M-03-03



**CW PUMP
LUBE FLOW
LOW**

EVENT POINT 0136

INDICATED CONDITION:

o CWP-1D UPPER BEARING LUBE WATER FLOW **<6 GPM** AS SENSED BY DO-11-FIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1D WHITE "LUBE WTR FLOW NORM" PERMISSIVE LIGHT NOT ON.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF LOW FLOW.
o REFER TO OP-416 AND INCREASE COOLING WATER FLOW TO CWP-1D.

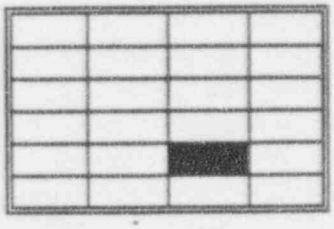
DISCUSSION:

LOW LUBE WATER FLOW OPERATION OF THE CIRC WATER PUMP SHOULD BE MINIMIZED TO PRECLUDE DAMAGE TO RUBBER BEARINGS OF THE PUMP SHAFT. IF ADEQUATE FLOW CANNOT BE RESTORED CONSIDER SHUTTING DOWN THE PUMP.

REFERENCES: DRAWING 208-018 SHEET CW-04

SENSING ELEMENT: DO-11-FIS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-03-05	M-03-05



WATER BOX VACUUM LOST

EVENT POINT 0039

INDICATED CONDITION:

o WATERBOX PRIMING VACUUM **<10.6" HG.** AS SENSED BY AR-18-PS2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o STANDBY WATERBOX PRIMING PUMP ARP-2A OR ARP-2B AUTO STARTS.

OPERATOR ACTIONS FOR A VALID ALARM:

o ENSURE BACKUP WATERBOX PRIMING PUMP STARTS.
o INVESTIGATE CAUSE OF LOSS OF WATERBOX VACUUM.
o VERIFY WATERBOX PRIMING VACUUM <10.6" Hg, INDICATOR LOCATED AT ARV-5.
o ENSURE WATERBOX INTEGRITY - CHECK MANWAYS AND VACUUM BREAKER VALVES ARE CLOSED AND PRIMING VALVES ARE OPEN.

DISCUSSION:

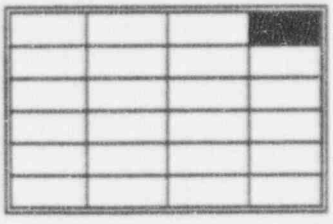
STANDBY WATERBOX PRIMING PUMP STARTS AT **<20.2" HG.**

THIS IS AN EXPECTED ALARM WHEN PRIMING AN OFF LINE WATERBOX.

REFERENCES: DRAWING 208-007 SHEET AR-05

SENSING ELEMENT: AR-18-PS2

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-04-01	M-04-01



CW PUMP D TRIP

EVENT POINT 0134

INDICATED CONDITION:

o CWP-1D BREAKER OPEN AND CONTROL HANDLE IN NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o GREEN LIGHT IS ON WITH A RED FLAG ON CWP-1D CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o MONITOR CONDENSER VACUUM.
o CLOSE ARV-44.
o VERIFY ON LINE SC HEAT EXCHANGER IS BEING SUPPLIED BY AN ON LINE CWP.
o REDUCE PLANT POWER AS NECESSARY TO MAINTAIN CONDENSER VACUUM.

DISCUSSION:

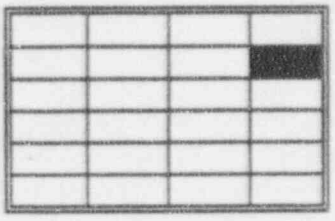
DO NOT CONTINUE TO OPERATE THE TURBINE WHEN BOTH CIRC WATER PUMPS ARE SHUTDOWN IN THE SAME CONDENSER.

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-018 SHEET CW-04

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-04-02	M-04-02



CW PUMP D MOTOR OVERLOAD

EVENT POINT 0133

INDICATED CONDITION:

o CWP-1D MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CWP-1D CURRENT INDICATOR.
o LOCAL CWP-1D AMMETER.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CWP-1D FOR SIGNS OF ABNORMAL OPERATION.
o CHECK BREAKER CUBICLE FOR DROPPED TARGETS.

DISCUSSION:

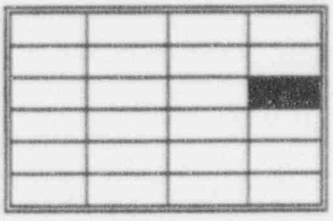
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-018 SHEET CW-04

SENSING ELEMENT: BREAKER OVERLOAD CONTACTS

TGF-M ANNUNCIATOR RESPONSE	TGF-AX1-04-03	M-04-03



CW PUMPS
LUBE WTR STRNR
Δ PRESS HIGH

EVENT POINT 1519

INDICATED CONDITION:

- o CIRC WATER LUBE WATER STRAINER DOFL-1, DIFFERENTIAL PRESSURE >5 PSID AS SENSED BY DO-25-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- o FLUSH ZURN FILTER AS PER OP-416.
- o VERIFY CIRC WATER PUMP DO WATER FLOW IS ADEQUATE.
- o VERIFY ZURN FILTER PRESSURE INDICATIONS.

DISCUSSION:

REFERENCES: DRAWING 208-022 SHEET DO-08

SENSING ELEMENT: DO-25-PS

Rev. 12 04/08/93

Effective Date 4/14/93

Document Section
INFORMATION ONLY
C. F. Nuclear

ANNUNCIATOR RESPONSE

AR-602

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

TGF N ANNUNCIATOR RESPONSE

THIS PROCEDURE ADDRESSES SAFETY RELATED COMPONENTS

APPROVED BY: Interpretation Contact

W. N Jamshall

DATE: 4/13/93

INTERPRETATION CONTACT: Manager, Nuclear Plant Operations

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ENCLOSURE

1	Annunciator Response	2

1.0 PURPOSE

1.1 Establish a reference document for each Annunciator Window on the TGF-AX2 Lampbox.

1.2 Establish operator actions for valid Annunciator alarms on the TGF-AX2 Lampbox.

1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the TGF-AX2 Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

2.1.1 AR-971, CXAR Annunciator Response

2.1.2 OP-603, Condensate System

2.1.3 OP-607, Condenser Vacuum System

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-224-049

3.0 PERSONNEL INDOCTRINATION

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

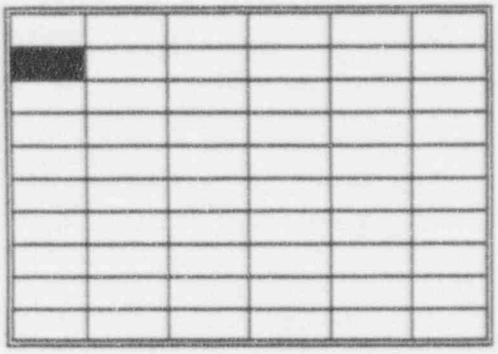
4.0 INSTRUCTIONS

4.1 Respond to alarms on the TGF-AX2 Lampbox as indicated on Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP ACTIONS

None

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-02	N-01-02



CONDENSER VAC PUMP TRIP

EVENT POINT 0037

INDICATED CONDITION:

- o ARP-1A BREAKER OPEN WITH LOCAL OR REMOTE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON ARP-1A LOCAL OR REMOTE CONTROL STATION.
- o MAIN CONDENSER VACUUM DECREASING CD-7-PIR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o START ARP-1B.
- o MONITOR CONDENSER VACUUM.

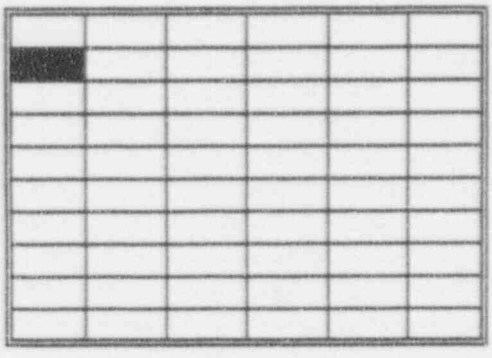
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN STARTING THE PUMP UNTIL TARGETS ARE MATCHED ON THE LOCAL CONTROL STATION.

REFERENCES: DRAWING 208-007 SHEET AR-01

SENSING ELEMENT: CONTACTS ON THE CONTROL STATION AND BREAKER

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-02	N-01-02



CONDENSER
VAC PUMP
TRIP

EVENT POINT 0038

INDICATED CONDITION:

- o ARP-1B BREAKER OPEN WITH LOCAL OR REMOTE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON ARP-1B LOCAL OR REMOTE CONTROL STATION.
- o MAIN CONDENSER VACUUM DECREASING CD-7-PIR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o START ARP-1A.
- o MONITOR CONDENSER VACUUM.

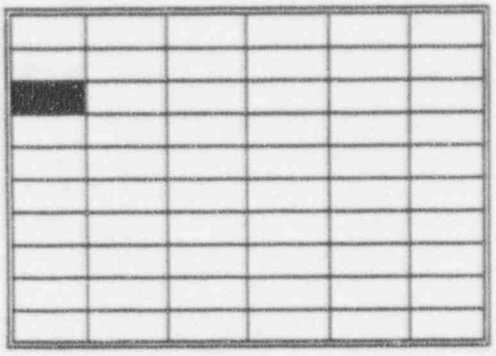
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN STARTING THE PUMP UNTIL TARGETS ARE MATCHED ON THE LOCAL CONTROL STATION.

REFERENCES: DRAWING 208-007 SHEET AR-02

SENSING ELEMENT: CONTACTS ON THE CONTROL STATION AND BREAKER

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-03	N-01-03



CONDENSER
VAC PUMP
TROUBLE

EVENT POINT 0025

INDICATED CONDITION:

- o ARP-1A BREAKER CLOSED AND EITHER LOCAL OR REMOTE CONTROL STATION IN NORMAL AFTER STOP.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON ARP-1A CONTROL STATION.
- o CONDENSER VACUUM COMPUTER POINT, T-215.
- o CONDENSER VACUUM CD-7-PIR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o MONITOR CONDENSER VACUUM.
- o IF CONDENSER VACUUM IS DECREASING, THEN REFER TO OP-607.

DISCUSSION:

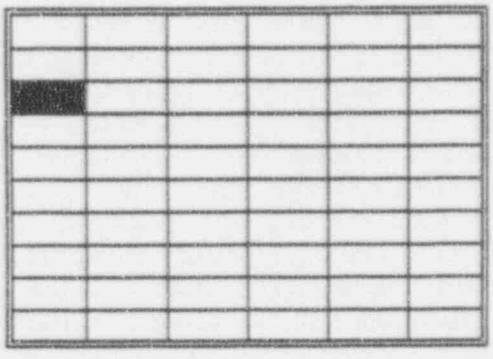
THE STANDBY CONDENSER VACUUM PUMP WILL AUTO START AT <26" HG AND DECREASING.

THIS IS AN EXPECTED ALARM WHEN STARTING ARP-1A FROM THE CONTROL ROOM UNTIL THE TARGETS ARE MATCHED ON THE LOCAL CONTROL STATION.

REFERENCES: DRAWING 208-007 SHEET AR-01

SENSING ELEMENT: CONTROL STATION AND BREAKER CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-03	N-01-03



CONDENSER VAC PUMP TROUBLE

EVENT POINT 0026

INDICATED CONDITION:

o ARP-1A MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o ARP-1A CURRENT INDICATOR.
o ARP-1A MOTOR RUNNING HOT.

OPERATOR ACTIONS FOR A VALID ALARM:

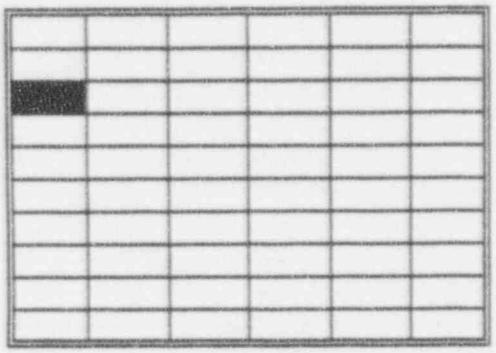
o CONSIDERATION SHOULD BE GIVEN TO PLACING ARP-1B IN SERVICE.
o CONTACT THE ELECTRIC SHOP.

DISCUSSION:

REFERENCES: DRAWING 208-007 SHEET AR-01

SENSING ELEMENT: BREAKER OVERLOAD CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-03	N-01-03



CONDENSER VAC PUMP TROUBLE

EVENT POINT 0027

INDICATED CONDITION:

o ARP-1A BREAKER CLOSED AND ARP-1A SEAL WATER PUMP, ARP-4A NOT RUNNING.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o ARP-4A GREEN INDICATING LIGHT IS ON LOCATED ON THE MCB.
o ARP-4A LOCAL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY ARP-4A LOCAL SELECTOR SWITCH IN AUTO.
o CONSIDERATION SHOULD BE GIVEN TO PLACING ARP-1B IN SERVICE.
o SELECT ARP-4A LOCAL CONTROLS TO HAND.

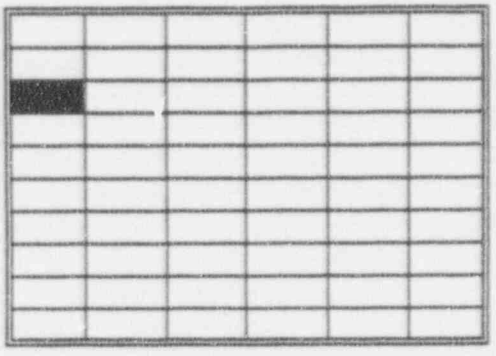
DISCUSSION:

ARP-4A WILL AUTO START WHENEVER ARP-1A IS STARTED IF THE LOCAL SELECTOR SWITCH IS IN AUTO. IF THE SELECTOR SWITCH IS IN OFF THE PUMP WILL NOT AUTO START.
AN AIR REMOVAL PUMP SHOULD NOT BE OPERATED WITHOUT A SEAL WATER PUMP IN SERVICE.

REFERENCES: DRAWING 208-007 SHEET AR-03

SENSING ELEMENT: BREAKER AND CONTROL STATION CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-03	N-01-03



CONDENSER VAC PUMP TROUBLE

EVENT POINT 0028

INDICATED CONDITION:

- o ARP-1B BREAKER CLOSED AND EITHER LOCAL OR REMOTE CONTROL STATION IN NORMAL AFTER STOP.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON ARP-1B CONTROL STATION.
- o CONDENSER VACUUM COMPUTER POINT, T-215.
- o CONDENSER VACUUM INDICATION CD-7-PIR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o MONITOR CONDENSER VACUUM.
- o IF CONDENSER VACUUM IS DECREASING, THEN REFER TO OP-607.

DISCUSSION:

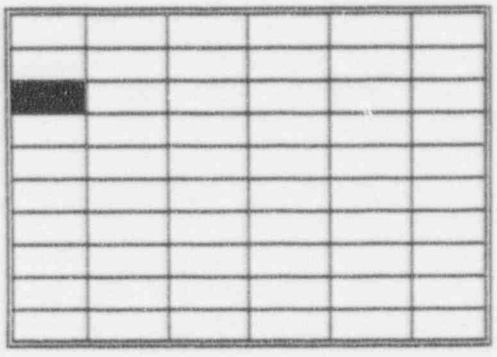
THE STANDBY CONDENSER VACUUM PUMP WILL AUTO START AT <26" HG AND DECREASING.

THIS IS AN EXPECTED ALARM WHEN STARTING ARP-1B FROM THE CONTROL ROOM UNTIL THE TARGETS ARE MATCHED ON THE LOCAL CONTROL STATION.

REFERENCES: DRAWING 208-007 SHEET AR-02

SENSING ELEMENT: CONTROL STATION AND BREAKER CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-03	N-01-03



CONDENSER
VAC PUMP
TROUBLE

EVENT POINT 0029

INDICATED CONDITION:

o ARP-1B MOTOR **AMPS** >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o ARP-1B MOTOR CURRENT INDICATOR.
o ARP-1B MOTOR RUNNING HOT.

OPERATOR ACTIONS FOR A VALID ALARM:

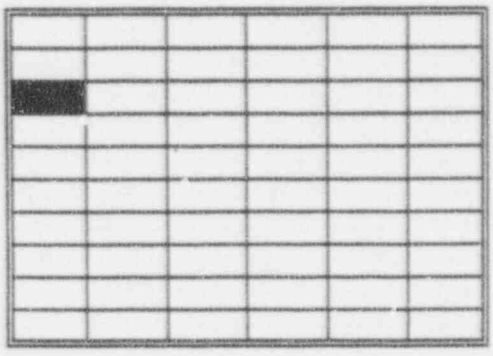
o CONSIDERATION SHOULD BE GIVEN TO PLACING ARP-1A IN SERVICE.
o CONTACT THE ELECTRIC SHOP.

DISCUSSION:

REFERENCES: DRAWING 208-007 SHEET AR-02

SENSING ELEMENT: BREAKER OVERLOAD CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-03	N-01-03



CONDENSER VAC PUMP TROUBLE

EVENT POINT 0030

INDICATED CONDITION:

o ARP-1B BREAKER CLOSED AND ARP-1B SEAL WATER PUMP, ARP-4B NOT RUNNING.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o ARP-4B GREEN INDICATING LIGHT IS ON, LOCATED ON THE MCB.
o ARP-4B LOCAL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY ARP-4B LOCAL SELECTOR SWITCH IN AUTO.
o CONSIDERATION SHOULD BE GIVEN TO PLACING ARP-1A IN SERVICE.
o SELECT ARP-4B LOCAL CONTROLS TO HAND.

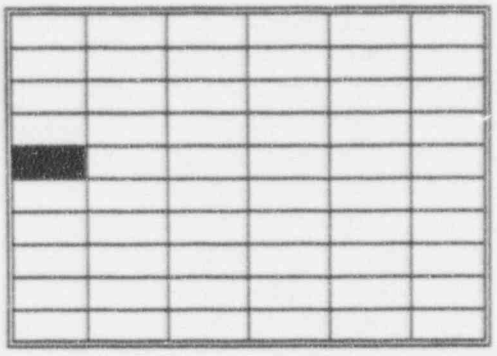
DISCUSSION:

ARP-4B WILL AUTO START WHENEVER ARP-1B IS STARTED IF THE LOCAL SELECTOR SWITCH IS IN AUTO. IF THE SELECTOR SWITCH IS IN OFF THE PUMP WILL NOT AUTO START.
AN AIR REMOVAL PUMP SHOULD NOT BE OPERATED WITHOUT A SEAL WATER PUMP IN SERVICE.

REFERENCES: DRAWING 208-007 SHEET AR-04

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-05	N-01-05



HOTWELL LEVEL HIGH/LOW

EVENT POINT 0092

INDICATED CONDITION:

o CONDENSER HOTWELL "A" LEVEL >8' 8 1/2" AS SENSED BY CD-1-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CONDENSER HOTWELL "A" LEVEL INDICATION, CD-67-LI1.
o LOCAL HOTWELL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

o ENSURE PROPER OPERATION OF HOTWELL LEVEL CONTROL SYSTEM.
o IF AUTOMATIC HOTWELL LEVEL CONTROL IS NOT FUNCTIONING PROPERLY THEN PLACE IN MANUAL PER OP-603.
o IF HOTWELL LEVEL IS BEING CONTROLLED MANUALLY THEN INFORM TURBINE BLDG. OPERATOR TO EITHER REDUCE DEMIN WATER MAKEUP OR INCREASE REJECT FLOW.

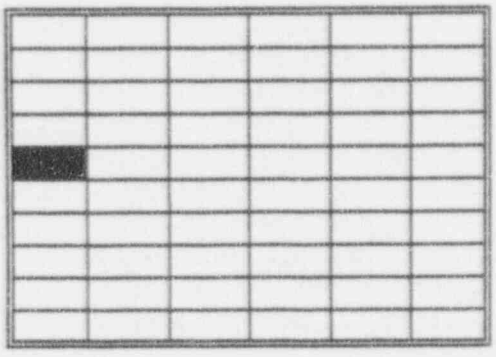
DISCUSSION:

HIGH HOTWELL LEVELS CAN RESULT IN A LOSS OF CONDENSER VACUUM.

REFERENCES: DRAWING 208-012 SHEET CD-08

SENSING ELEMENT: CD-1-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-05	N-01-05



HOTWELL
LEVEL
HIGH/LOW

EVENT POINT 0093

INDICATED CONDITION:

o CONDENSER HOTWELL "A" LEVEL <8' 2 1/2" AS SENSED BY CD-2-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CONDENSER HOTWELL "A" LEVEL INDICATION, CD-67-LI1.
o LOCAL HOTWELL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

o ENSURE PROPER OPERATION OF HOTWELL LEVEL CONTROL SYSTEM.
o IF AUTOMATIC HOTWELL LEVEL CONTROL IS NOT FUNCTIONING PROPERLY THEN PLACE IN MANUAL PER OP-603.
o IF HOTWELL LEVEL IS BEING CONTROLLED MANUALLY THEN INFORM TURBINE BLDG. OPERATOR TO EITHER INCREASE DEMIN WATER MAKEUP OR REDUCE REJECT FLOW.

DISCUSSION:

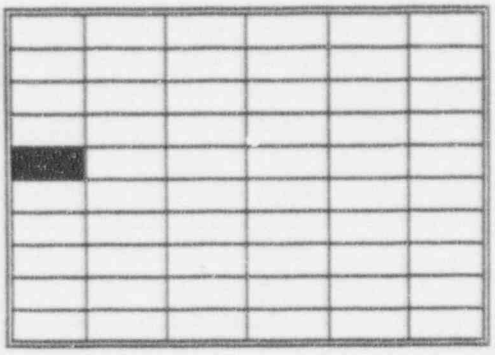
CONDENSER HOTWELL IS A STS REQUIRED WATER SOURCE. WATER LEVEL SHOULD BE MAINTAINED ABOVE 6' 6" (78") WHICH IS 150,000 GALLON VOLUME.

REFER TO STS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-012 SHEET CD-08

SENSING ELEMENT: CD-2-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-05	N-01-05



HOTWELL
LEVEL
HIGH/LOW

EVENT POINT 0094

INDICATED CONDITION:

- o CONDENSER HOTWELL "B" LEVEL >8' 8 1/2" AS SENSED BY CD-3-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CONDENSER HOTWELL "B" LEVEL INDICATION, CD-67-LI2.
- o LOCAL HOTWELL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE PROPER OPERATION OF HOTWELL LEVEL CONTROL SYSTEM.
- o IF AUTOMATIC HOTWELL LEVEL CONTROL IS NOT FUNCTIONING PROPERLY THEN PLACE IN MANUAL PER OP-603.
- o IF HOTWELL LEVEL IS BEING CONTROLLED MANUALLY THEN INFORM TURBINE BLDG. OPERATOR TO EITHER REDUCE DEMIN WATER MAKEUP OR INCREASE REJECT FLOW.

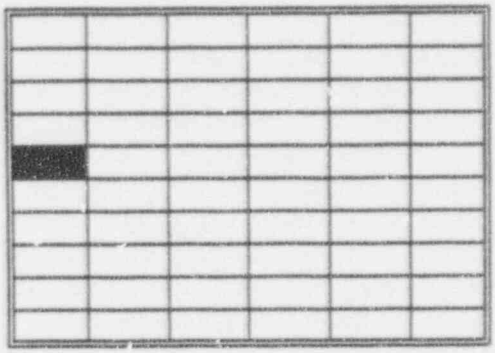
DISCUSSION:

HIGH HOTWELL LEVELS CAN RESULT IN A LOSS OF CONDENSER VACUUM.

REFERENCES: DRAWING 208-012 SHEET CD-08

SENSING ELEMENT: CD-3-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-05	N-01-05



HOTWELL LEVEL HIGH/LOW

EVENT POINT 0095

INDICATED CONDITION:

o CONDENSER HOTWELL "B" LEVEL <8' 2 1/2" AS SENSED BY CD-4-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CONDENSER HOTWELL "B" LEVEL INDICATION, CD-67-LI2.
o LOCAL HOTWELL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

o ENSURE PROPER OPERATION OF HOTWELL LEVEL CONTROL SYSTEM.
o IF AUTOMATIC HOTWELL LEVEL CONTROL IS NOT FUNCTIONING PROPERLY THEN PLACE IN MANUAL PER OP-603.
o IF HOTWELL LEVEL IS BEING CONTROLLED MANUALLY THEN INFORM TURBINE BLDG. OPERATOR TO EITHER INCREASE DEMIN WATER MAKEUP OR REDUCE REJECT FLOW.

DISCUSSION:

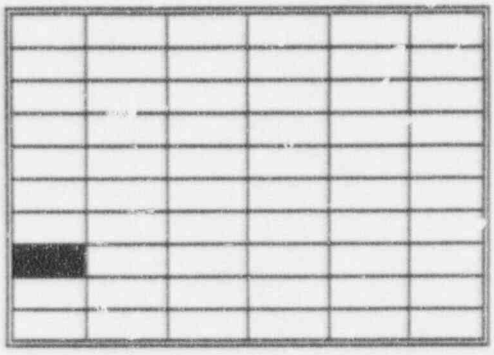
CONDENSER HOTWELL IS A STS REQUIRED WATER SOURCE. WATER LEVEL SHOULD BE MAINTAINED ABOVE 6' 6" (78") WHICH IS 150,000 GALLON VOLUME.

REFER TO STS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING 208-012 SHEET CD-08

SENSING ELEMENT: CD-4-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-08	N-01-08



COND DEMIN
PANEL
TROUBLE

EVENT POINT 0158

INDICATED CONDITION:

o CONDENSATE DEMIN ALARM PANEL HAS AN UNACKNOWLEDGED DROPPED TARGET.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL DROPPED TARGET INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o NOTIFY TURBINE BUILDING OPERATOR TO INVESTIGATE ALARM AND REFER TO AR-971 CONDENSATE DEMIN ALARM PANEL.

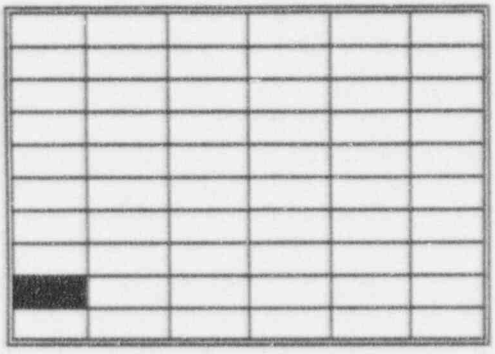
DISCUSSION:

ONCE THIS ALARM HAS ACTUATED THE WINDOW WILL NOT REFLASH WHEN ANOTHER TARGET DROPS UNLESS THE INITIAL ALARM HAS BEEN ACKNOWLEDGED LOCALLY.

REFERENCES: DRAWING 208-017 SHEET CX-22

SENSING ELEMENT: CONTACT INSIDE DROP TARGET PANEL

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-01-09	N-01-09



CNDSR CNTRL
AIR PRESS
LOW

EVENT POINT 0040

INDICATED CONDITION:

o INSTRUMENT AIR PRESSURE TO WATER BOX VACUUM BREAKERS <80 PSIG AS SENSED BY AR-19,20,21,22,23,24,25 OR 26-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o INSTRUMENT AIR PRESSURE INDICATORS.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE THE CAUSE OF LOW PRESSURE.

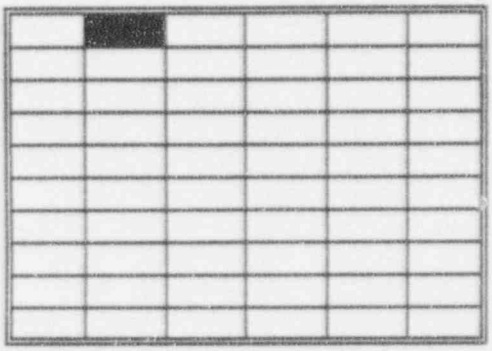
DISCUSSION:

WATERBOX VACUUM BREAKERS FAIL CLOSED ON A LOSS OF INSTRUMENT AIR. EACH WATERBOX VACUUM BREAKER HAS AN AIR RESERVOIR AND A FILTER REGULATOR.

REFERENCES: DRAWING 208-007 SHEET AR-16

SENSING ELEMENTS: AR-19,20,21,22,23,24,25,26-PS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-01	N-02-01



CDSTE PUMP A TRIP

EVENT POINT 0082

INDICATED CONDITION:

- o CDP-1A BREAKER OPEN WITH CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON CDP-1A CONTROL CATION.
- o WHITE "DEAER LEVEL NORM" LIGHT IS OFF, LOCATED ON THE CDP-1A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF CAUSE OF TRIP IS A HIGH DEAERATOR LEVEL, THEN TAKE MANUAL CONTROL OF CDP-1A BAILEY CONTROLLER AND DRIVE DEMAND TO "0", RESTART CDP-1A AND RETURN CONDENSATE FLOW TO NORMAL USING THE HAND/AUTO STATION.
- o IF CDP-1A CANNOT BE RESTARTED REDUCE PLANT POWER TO A LEVEL AT WHICH 1 CONDENSATE PUMP CAN SUPPLY SUFFICIENT CONDENSATE FLOW.

DISCUSSION:

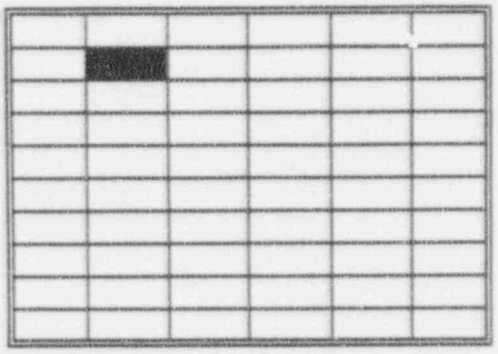
CDP-1A WILL TRIP IF DEAERATOR LEVEL GOES **>13'6 1/2"** AS SENSED BY FW-4-LS.

MAXIMUM CONDENSATE FLOW RATE FOR A SINGLE CONDENSATE PUMP IS **5.4 E6 LBM/HR** AND MAXIMUM PUMP SPEED IS **1135 RPM** - THESE TWO LIMITATIONS WILL PREVENT PUMP RUNOUT.

REFERENCES: DRAWING 208-013 SHEET CD-01

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-02	N-02-02



CDSTE PUMP A UNCOUPLED

EVENT POINT 0085

INDICATED CONDITION:

- o CDP-1A MOTOR RUNNING, BEING CONTROLLED FROM THE NORMAL CONDENSATE PUMP CONTROLLER, AND A LOW VOLTAGE IS SENSED ON MAGNETIC COUPLING CONTROLLER OUTPUT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDP-1A PUMP NOT ROTATING.
- o CONDENSATE FLOW DECREASING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o SWAP CDP-1A TO SPARE CONTROLLER PER OP-603.
- o IF CDP-1A CANNOT BE CONTROLLED THEN REDUCE PLANT POWER TO A LEVEL AT WHICH 1 CONDENSATE PUMP CAN SUPPLY SUFFICIENT CONDENSATE FLOW.

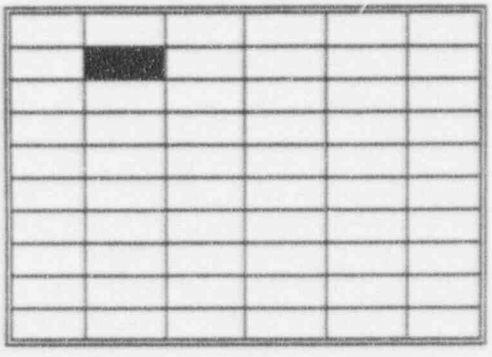
DISCUSSION:

THIS ALARM INDICATES THE CONTROLLING VOLTAGE SIGNAL TO THE MAGNETIC COUPLING ON THE CONDENSATE PUMP IS LOW. THIS WILL CAUSE THE PUMP TO STOP. THIS IS A NORMAL ALARM WHEN SHUTTING DOWN A CONDENSATE PUMP.

REFERENCES: DRAWING 208-012 SHEET CD-01

SENSING ELEMENT: BREAKER CONTACTS AND 2TIR2 (LOW VOLTAGE RELAY)

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-02	N-02-02



CDSTE PUMP A UNCOUPLED

EVENT POINT 0086

INDICATED CONDITION:

- o CDP-1A MOTOR RUNNING CONTROLLED FROM THE SPARE CONTROLLER, AND LOW VOLTAGE IS SENSED ON THE MAGNETIC COUPLING CONTROLLER OUTPUT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDP-1A PUMP NOT ROTATING.
- o CONDENSATE FLOW DECREASING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o SWAP CDP-1A TO NORMAL CONTROLLER PER OP-603.
- o IF CDP-1A CANNOT BE CONTROLLED THEN REDUCE PLANT POWER TO A LEVEL AT WHICH 1 CONDENSATE PUMP CAN SUPPLY SUFFICIENT CONDENSATE FLOW.

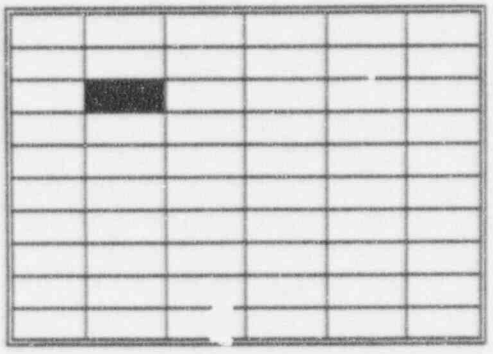
DISCUSSION:

THIS ALARM INDICATES THE CONTROLLING VOLTAGE SIGNAL TO THE MAGNETIC COUPLING ON THE CONDENSATE PUMP IS LOW. THIS WILL CAUSE THE PUMP TO STOP. THIS IS A NORMAL ALARM WHEN SHUTTING DOWN A CONDENSATE PUMP.

REFERENCES: DRAWING 208-012 SHEET CD-01

SENSING ELEMENT: BREAKER CONTACTS AND 3TIR2 (LOW VOLTAGE RELAY)

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-03	N-02-03



CDSTE PUMP
MOTOR
OVERLOAD

EVENT POINT 0083

INDICATED CONDITION:

- o CONDENSATE PUMP 1A MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDP-1A HIGH AMPS ON CURRENT INDICATOR.
- o CDP-1A TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o REDUCE LOAD ON CDP-1A.
- o IF LOAD CANNOT BE REDUCED CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN CDP-1A.

DISCUSSION:

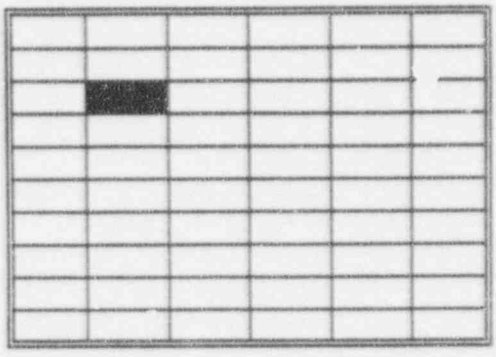
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-012 SHEET CD-01

SENSING ELEMENT: OVERCURRENT RELAY (49)

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-03	N-02-03



CDSTE PUMP
MOTOR
OVERLOAD

EVENT POINT 0087

INDICATED CONDITION:

o CONDENSATE PUMP 1B MOTOR **AMPS >115%** RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CDP-1B HIGH AMPS CURRENT INDICATOR.
o CDP-1B TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

o REDUCE LOAD ON CDP-1B.
o IF LOAD CANNOT BE REDUCED CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN CDP-1B.

DISCUSSION:

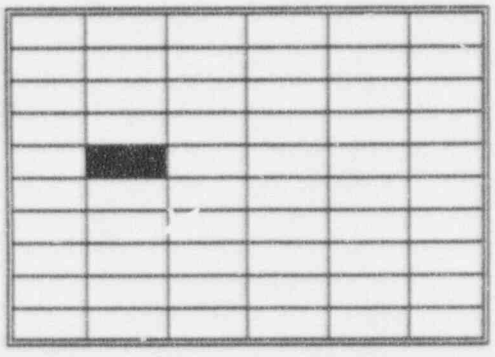
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-012 SHEET CD-02

SENSING ELEMENT: OVERCURRENT RELAY (49)

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-05	N-02-05



CDV 100
OPEN

EVENT POINT 0091

INDICATED CONDITION:

o CDV-100 IS NOT FULL CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o RAPIDLY INCREASING HOTWELL LEVELS.
o RAPIDLY DECREASING CONDENSATE STORAGE TANK LEVEL.

OPERATOR ACTIONS FOR A VALID ALARM:

o CLOSE CDV-100.
o CLOSE CDV99 TO ISOLATE CDV-100, LOCATED ON THE 95' ELEVATION TB.

DISCUSSION:

CDV-100 IS THE CONDENSER EMERGENCY MAKEUP VALVE.

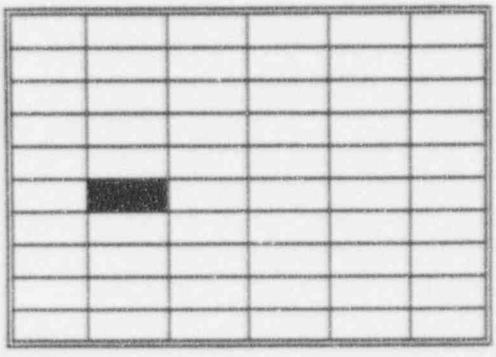
CDV-100 IS A MANUALLY OPERATED PNEUMATIC VALVE (THE AIR IS ISOLATED AND CAPPED).

CDV-100 IS NORMALLY ISOLATED WITH CDV-99 BEING CLOSED.

REFERENCES: DRAWING 208-012 SHEET CD-07

SENSING ELEMENT: CLOSED CONTACT ON CDV-100

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-06	N-02-06



CDSTE
STOR TNK LEVEL
HIGH/LOW

EVENT POINT 0096

INDICATED CONDITION:

o CONDENSATE STORAGE TANK LEVEL >31 FEET AS SENSED F CD-58-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CONDENSATE STORAGE TANK LEVEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

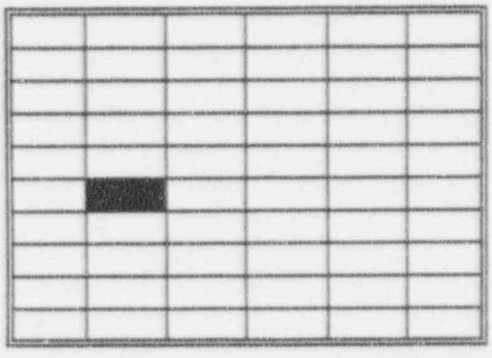
o REDUCE REJECT GOING TO CONDENSATE STORAGE TANK.

DISCUSSION:

REFERENCES: DRAWING 208-012 SHEET CD-09

SENSING ELEMENT:CD-58-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-02-06	N-02-06



CDSTE
STOR TNK LEVEL
HIGH/LOW

EVENT POINT 0097

INDICATED CONDITION:

o CONDENSATE STORAGE TANK LEVEL **<24 FEET** AS SENSED BY CD-59-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CONDENSATE STORAGE TANK LEVEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

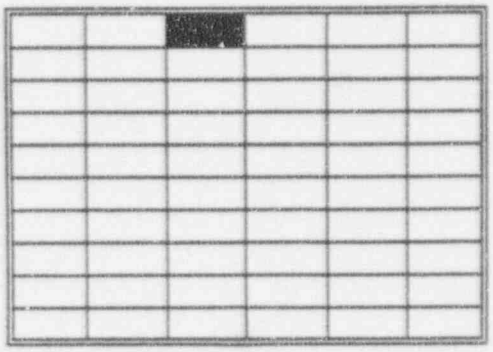
o ADD WATER TO CONDENSATE STORAGE TANK.

DISCUSSION:

REFERENCES: DRAWING 208-012 SHEET CD-08

SENSING ELEMENT:CD-59-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-03-01	N-03-01



CDSTE PUMP B TRIP

EVENT POINT 0099

INDICATED CONDITION:

- o CDP-1B BREAKER OPEN WITH CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON CDP-1B CONTROL CATION.
- o WHITE "DEAER LEVEL NORM" LIGHT IS OFF, LOCATED ON THE CDP-1B CONTROL STATION.
- o CONDENSATE FLOW INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF CAUSE OF TRIP IS A HIGH DEAERATOR LEVEL, THEN TAKE MANUAL CONTROL OF CDP-1B BAILEY CONTROLLER AND DRIVE DEMAND TO "0", RESTART CDP-1B AND RETURN CONDENSATE FLOW TO NORMAL USING THE HAND/AUTO STATION.
- o IF CDP-1B CANNOT BE RESTARTED REDUCE PLANT POWER TO A LEVEL AT WHICH 1 CONDENSATE PUMP CAN SUPPLY SUFFICIENT CONDENSATE FLOW.

DISCUSSION:

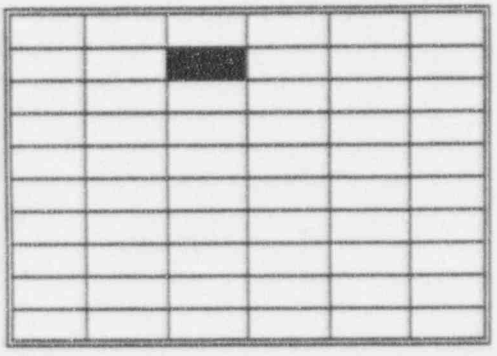
A DEAERATOR LEVEL OF **>13'6 1/2"** SENSED BY FW-341-LS WILL TRIP CDP-1B.

MAXIMUM CONDENSATE FLOW-RATE FOR A SINGLE CONDENSATE PUMP IS **5.4 E6 LBM/HR** MAXIMUM CONDENSATE PUMP SPEED IS **1135 RPM**. THESE TWO LIMITATION WILL PREVENT PUMP RUNOUT.

REFERENCES: DRAWING 208-013 SHEET CD-02

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-03-02	N-03-02



CDSTE PUMP B UNCOUPLED

EVENT POINT 0089

INDICATED CONDITION:

- o CDP-1B MOTOR RUNNING ON NORMAL CONTROLLER AND A LOW VOLTAGE IS SENSED ON THE MAGNETIC COUPLING CONTROLLER OUTPUT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDP-1B PUMP NOT ROTATING.
- o CONDENSATE FLOW DECREASING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o SWAP CDP-1B TO SPARE CONTROLLER PER OP-603.
- o IF CDP-1B CANNOT BE CONTROLLED THEN REDUCE PLANT POWER TO A LEVEL AT WHICH 1 CONDENSATE PUMP CAN SUPPLY SUFFICIENT CONDENSATE FLOW.

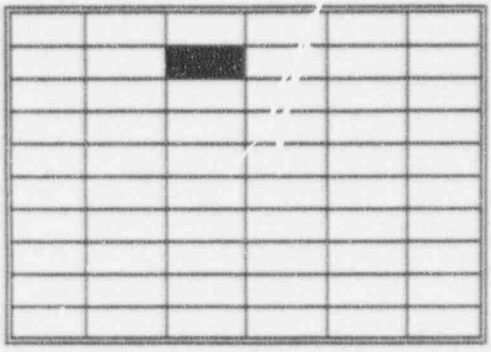
DISCUSSION:

THIS ALARM INDICATES THE CONTROLLING VOLTAGE SIGNAL TO THE MAGNETIC COUPLING ON THE CONDENSATE PUMP IS LOW. THIS WILL CAUSE THE PUMP TO STOP. THIS IS A NORMAL ALARM WHEN SHUTTING DOWN A CONDENSATE PUMP.

REFERENCES: DRAWING 208-012 SHEET CD-02

SENSING ELEMENT: BREAKER CONTACTS AND 2TIR2 (LOW VOLTAGE RELAY)

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-03-02	N-03-02



CDSTE PUMP B UNCOUPLED

EVENT POINT 0090

INDICATED CONDITION:

- o CDP-1B MOTOR RUNNING CONTROLLED FROM THE SPARE CONTROLLER AND A LOW VOLTAGE IS SENSED ON THE MAGNETIC COUPLING CONTROLLER OUTPUT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDP-1B PUMP NOT ROTATING.
- o CONDENSATE FLOW DECREASING.

OPERATOR ACTIONS FOR A VALID ALARM:

- o SWAP CDP-1B TO NORMAL CONTROLLER PER OP-603.
- o IF CDP-1B CANNOT BE CONTROLLED THEN REDUCE PLANT POWER TO A LEVEL AT WHICH 1 CONDENSATE PUMP CAN SUPPLY SUFFICIENT CONDENSATE FLOW.

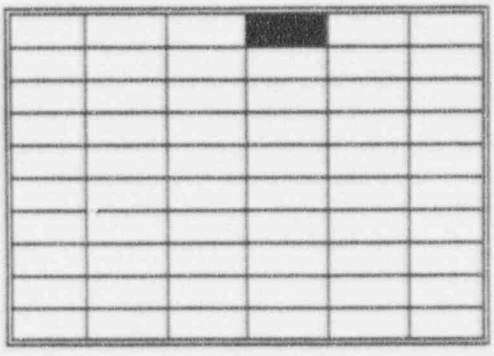
DISCUSSION:

THIS ALARM INDICATES THE CONTROLLING VOLTAGE SIGNAL TO THE MAGNETIC COUPLING ON THE CONDENSATE PUMP IS LOW. THIS WILL CAUSE THE PUMP TO STOP. THIS IS A NORMAL ALARM WHEN SHUTTING DOWN A CONDENSATE PUMP.

REFERENCES: DRAWING 208-012 SHEET CD-02

SENSING ELEMENT: BREAKER CONTACTS AND 3TIR2 (LOW VOLTAGE RELAY)

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-01	N-04-01



CDSTE HTR 1A/B LEVEL HIGH

EVENT POINT 0266

INDICATED CONDITION:

- o CONDENSATE HEATER 1A LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-20-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDHE-1A LOCAL SIGHTGLASS

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE HEATER DUMP VALVE, HDV-102 OPEN.
- o ENSURE HEATER CONTROL VALVE, HDV-101 OPEN.

DISCUSSION:

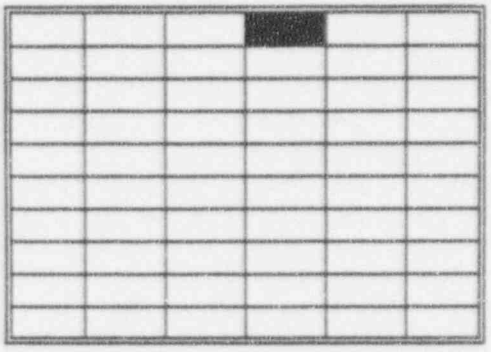
A HIGH-HIGH LEVEL IN CDHE-1A WILL TRIP THE TURBINE.

CDHE-1A HAS NO EXTRACTION NON-RETURN VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-03

SENSING ELEMENT: HD-20-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-01	N-04-01



**CDSTE HTR 1A/B
LEVEL
HIGH**

EVENT POINT 0269

INDICATED CONDITION:

- o CONDENSATE HEATER 1B LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-22-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDHE-1B LOCAL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE HEATER DUMP VALVE, HDV-104 OPEN.
- o ENSURE HEATER CONTROL VALVE, HDV-103 OPEN.

DISCUSSION:

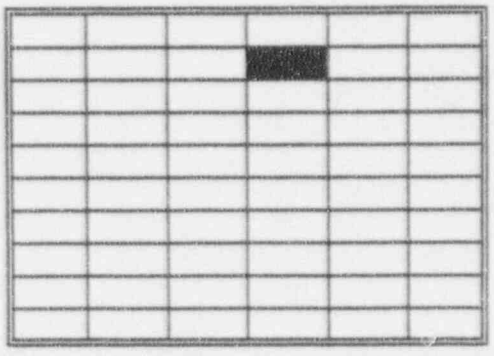
A HIGH-HIGH LEVEL IN CDHE-1B WILL TRIP THE TURBINE.

CDHE-1B HAS NO EXTRACTION NON-RETURN VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-03

SENSING ELEMENT: HD-22-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-02	N-04-02



**CNDSTE HTR 1A/B
DUMP VALVES
NOT FULL CLOSED**

EVENT POINT 0267

INDICATED CONDITIO :

o CONDENSATE HEATER 1A DUMP VALVE HDV-102, NOT FULL CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL VALVE POSITION.
o CDHE-1A LEVEL HIGH.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER CDHE-1A LEVEL CONTROL VALVE, HDV-101 OPERATION.

DISCUSSION:

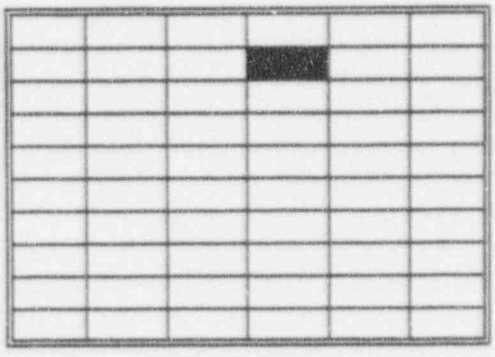
A HIGH LEVEL IN CDHE-1A WILL OPEN THE DUMP VALVE.

A TURBINE TRIP AS SENSED BY LOW AUTO-STOP OIL PRESSURE WILL OPEN THE DUMP VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-03

SENSING ELEMENT: CLOSED CONTACT ON VALVE.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-02	N-04-02



**CNDSTE HTR 1A/B
DUMP VALVES
NOT FULL CLOSED**

EVENT POINT 0270

INDICATED CONDITION:

o CONDENSATE HEATER 1B DUMP VALVE HDV-104, NOT FULL CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL VALVE POSITION.
o CDHE-1B LEVEL HIGH.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER CDHE-1B LEVEL CONTROL VALVE, HDV-103 OPERATION.

DISCUSSION:

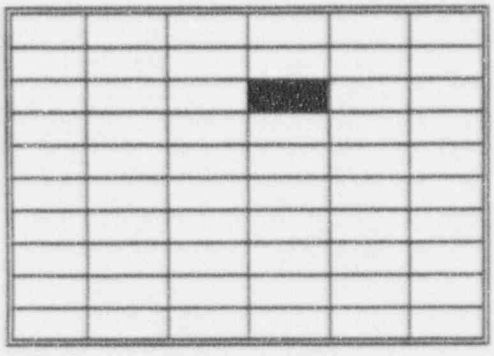
A HIGH LEVEL IN CDHE-1B WILL OPEN THE DUMP VALVE.

A TURBINE TRIP AS SENSED BY LOW AUTO-STOP OIL PRESSURE WILL OPEN THE DUMP VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-03

SENSING ELEMENT: CLOSED CONTACT ON VALVE.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-03	N-04-03



DEAERATOR LEVEL HIGH/LOW

EVENT POINT 1500

INDICATED CONDITION:

o DEAERATOR LEVEL >11' 9 1/2" AS SENSED BY FW-6-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o DEAERATOR LEVEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o REDUCE CONDENSATE FLOW TO THE DEAERATOR.

DISCUSSION:

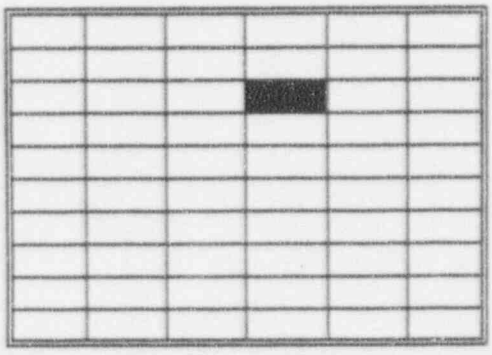
WHEN DEAERATOR LEVEL REACHES >12'3 1/2" DEAERATOR DUMP VALVE HDV-83 OPENS, AND FWHE-5A/B CASCADE VALVES HDV-53 AND HDV-54 CLOSE.

WHEN DEAERATOR LEVEL REACHES >13'6 1/2" THE CONDENSATE PUMPS WILL TRIP.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-6-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-03	N-04-03



DEAERATOR LEVEL HIGH/LOW

EVENT POINT 1501

INDICATED CONDITION:

o DEAERATOR LEVEL <7' AS SENSED BY FW-6-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o DEAERATOR LEVEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o INCREASE CONDENSATE FLOW TO THE DEAERATOR.

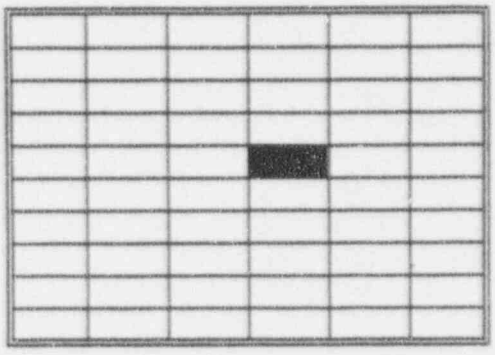
DISCUSSION:

WHEN DEAERATOR LEVEL REACHES <2'10" MAIN FEEDWATER BOOSTER PUMPS WILL TRIP

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-6-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-05	N-04-05



FW HTR 3/5/6
LEVEL
HIGH

EVENT POINT 0278

INDICATED CONDITION:

- o CONDENSATE HEATER 3A LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-28-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY HEATER DUMP VALVE, HDV-123 OPEN.
- o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-119.

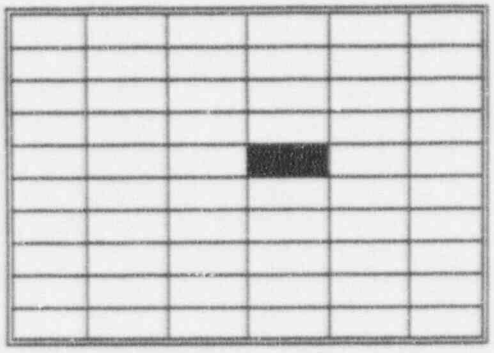
DISCUSSION:

ON A HIGH-HIGH HEATER LEVEL THE EXTRACTION NON-RETURN VALVE THAT FEEDS THE HEATER WILL CLOSE.

REFERENCES: DRAWING 208-065 SHEET HD-07

SENSING ELEMENT: HD-28-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-05	N-04-05



FW HTR 3/5/6
LEVEL
HIGH

EVENT POINT 0281

INDICATED CONDITION:

o CONDENSATE HEATER 3B LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-30-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY HEATER DUMP VALVE, HDV-124 OPEN.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-120.

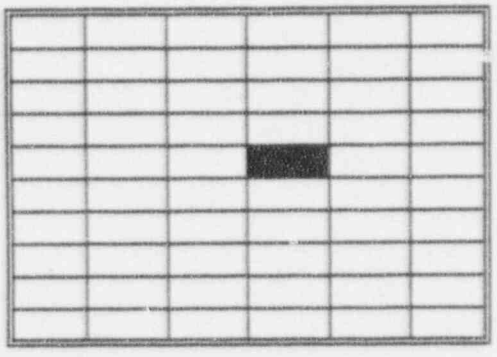
DISCUSSION:

ON A HIGH-HIGH HEATER LEVEL THE EXTRACTION NON-RETURN VALVE THAT FEEDS THE HEATER WILL CLOSE.

REFERENCES: DRAWING 208-065 SHEET HD-07

SENSING ELEMENT: HD-30-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-05	N-04-05



FW HTR 3/5/6
LEVEL
HIGH

EVENT POINT 0284

INDICATED CONDITION:

o CONDENSATE HEATER 5A LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-69-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY HEATER DUMP VALVE, HDV-55 OPEN.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-53.

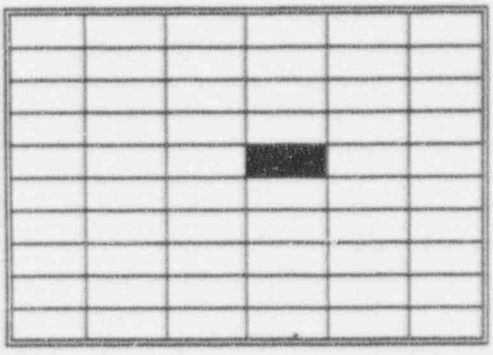
DISCUSSION:

ON A HIGH-HIGH HEATER LEVEL THE EXTRACTION NON-RETURN VALVE THAT FEEDS THE HEATER WILL CLOSE.

REFERENCES: DRAWING 208-065 SHEET HD-09

SENSING ELEMENT: HD-69-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-05	N-04-05



FW HTR 3/5/6
LEVEL
HIGH

EVENT POINT 0287

INDICATED CONDITION:

- o CONDENSATE HEATER 5B LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-70-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY HEATER DUMP VALVE, HDV-56 OPEN.
- o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-54.

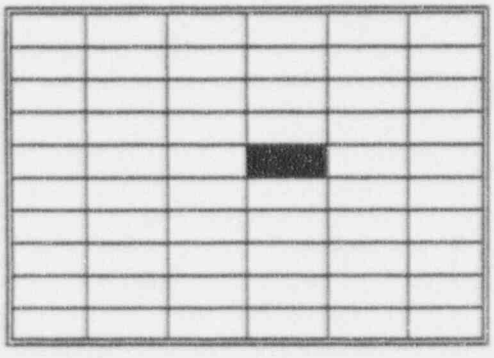
DISCUSSION:

ON A HIGH-HIGH HEATER LEVEL THE EXTRACTION NON-RETURN VALVE THAT FEEDS THE HEATER WILL CLOSE.

REFERENCES: DRAWING 208-065 SHEET HD-09

SENSING ELEMENT: HD-70-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-05	N-04-05



FW HTR 3/5/6
LEVEL
HIGH

EVENT POINT 0290

INDICATED CONDITION:

- o CONDENSATE HEATER 6A LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-71-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY HEATER DUMP VALVE, HDV-63 OPEN.
- o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-61.

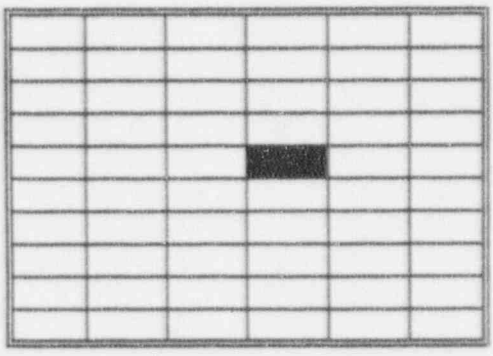
DISCUSSION:

ON A HIGH-HIGH HEATER LEVEL THE EXTRACTION NON-RETURN VALVE THAT FEEDS THE HEATER WILL CLOSE.

REFERENCES: DRAWING 208-065 SHEET HD-11

SENSING ELEMENT: HD-71-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-05	N-04-05



FW HTR 3/5/6
LEVEL
HIGH

EVENT POINT 0293

INDICATED CONDITION:

- o CONDENSATE HEATER 6B LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-72-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY HEATER DUMP VALVE, HDV-64 OPEN.
- o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-62.

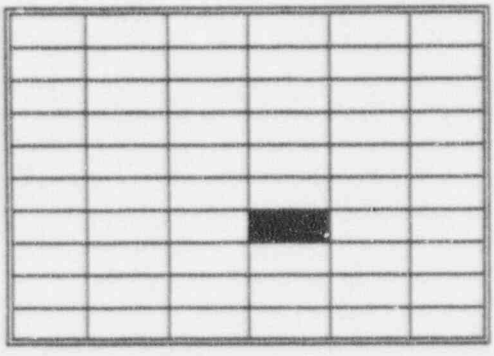
DISCUSSION:

ON A HIGH-HIGH HEATER LEVEL THE EXTRACTION NON-RETURN VALVE THAT FEEDS THE HEATER WILL CLOSE.

REFERENCES: DRAWING 208-065 SHEET HD-11

SENSING ELEMENT: HD-72-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-07	N-04-07



REHEATER SHELL LEVEL HIGH

EVENT POINT 0257

INDICATED CONDITION:

o "A" MOISTURE SEPARATOR REHEATER BELLY DRAIN LEVEL >6" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-98-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL BELLY DRAINS SIGHTGLASS INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF BELLY DRAINS LEVEL CONTROL VALVE, HDV-77.

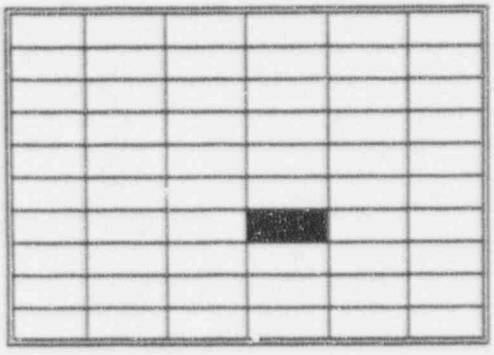
DISCUSSION:

THE MSR BELLY DRAINS ARE DUMPED DIRECTLY TO THE HOTWELL.

REFERENCES: DRAWING 208-065 SHEET HD-001

SENSING ELEMENT: HD-98-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-07	N-04-07



REHEATER SHELL LEVEL HIGH

EVENT POINT 0259

INDICATED CONDITION:

o "B" MOISTURE SEPARATOR REHEATER BELLY DRAIN LEVEL >6" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-101-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL BELLY DRAINS SIGHTGLASS INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF BELLY DRAINS LEVEL CONTROL VALVE, HDV-78.

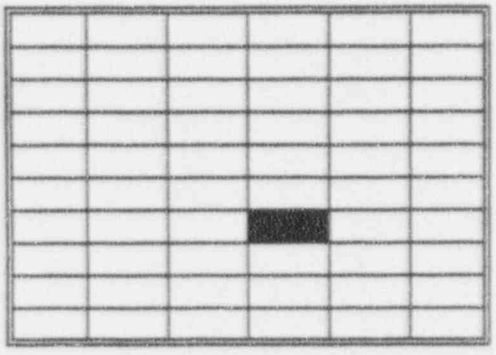
DISCUSSION:

THE MSR BELLY DRAINS ARE DUMPED DIRECTLY TO THE HOTWELL.

REFERENCES: DRAWING 208-065 SHEET HD-001

SENSING ELEMENT: HD-101-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-07	N-04-07



REHEATER SHELL LEVEL HIGH

EVENT POINT 0261

INDICATED CONDITION:

- o "C" MOISTURE SEPARATOR REHEATER BELLY DRAIN LEVEL >6" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-104-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL BELLY DRAINS SIGHTGLASS INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER OPERATION OF BELLY DRAINS LEVEL CONTROL VALVE, HDV-79.

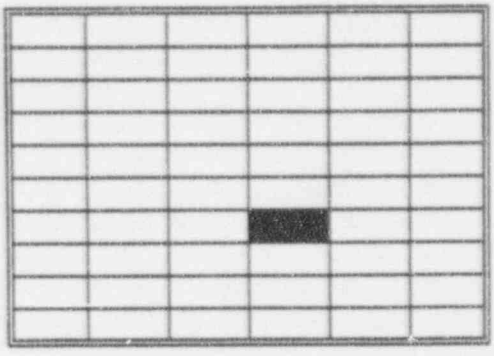
DISCUSSION:

THE MSR BELLY DRAINS ARE DUMPED DIRECTLY TO THE HOTWELL.

REFERENCES: DRAWING 208-065 SHEET HD-002

SENSING ELEMENT: HD-104-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-07	N-04-07



REHEATER SHELL LEVEL HIGH

EVENT POINT 0263

INDICATED CONDITION:

o "D" MOISTURE SEPARATOR REHEATER BELLY DRAIN LEVEL >6" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-107-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL BELLY DRAINS SIGHTGLASS INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF BELLY DRAINS LEVEL CONTROL VALVE, HDV-80.

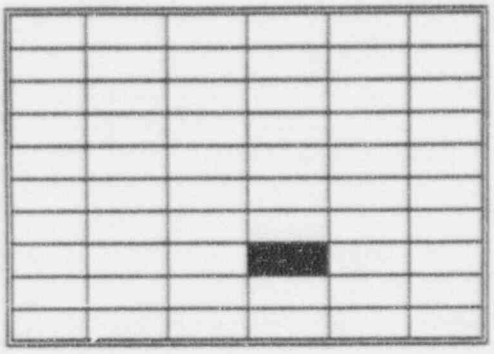
DISCUSSION:

THE MSR BELLY DRAINS ARE DUMPED DIRECTLY TO THE HOTWELL.

REFERENCES: DRAWING 208-065 SHEET HD-002

SENSING ELEMENT: HD-107-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0295

INDICATED CONDITION:

- o MSR HIGH PRESSURE DRAIN TANK "A" LEVEL >4" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-48-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL MSR HIGH PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER OPERATION OF MSR "A" DUMP VALVE, HDV-250.
- o VERIFY PROPER OPERATION OF MSR "A" LEVEL CONTROL VALVE HDV-9.

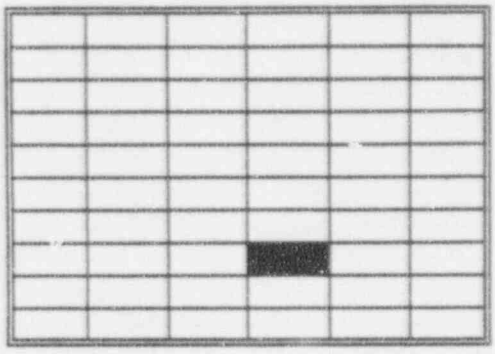
DISCUSSION:

DRAINS FROM THE "A" MSR HP DRAIN TANK GO TO FWHE-6A SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-012

SENSING ELEMENT: HD-48-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0296

INDICATED CONDITION:

o MSR HIGH PRESSURE DRAIN TANK "B" LEVEL >4" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-44-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL MSR HIGH PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF MSR "B" DUMP VALVE, HDV-247.
o VERIFY PROPER OPERATION OF MSR "B" LEVEL CONTROL VALVE HDV-10.

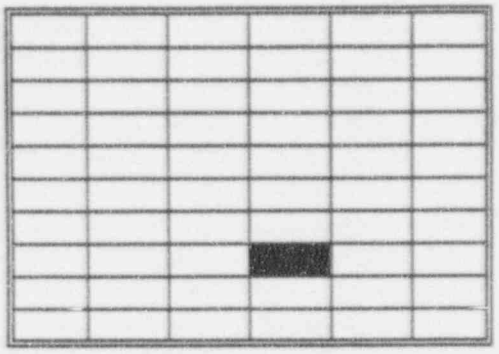
DISCUSSION:

DRAINS FROM THE "B" MSR HP DRAIN TANK GO TO FWHE-6A SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-013

SENSING ELEMENT: HD-44-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0297

INDICATED CONDITION:

- o MSR HIGH PRESSURE DRAIN TANK "C" LEVEL >4" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-50-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL MSR HIGH PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER OPERATION OF MSR "C" DUMP VALVE, HDV-249.
- o VERIFY PROPER OPERATION OF MSR "C" LEVEL CONTROL VALVE HDV-11

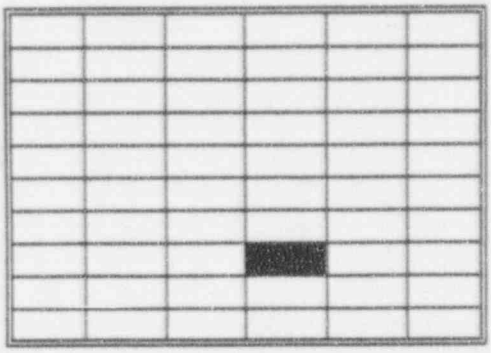
DISCUSSION:

DRAINS FROM THE "C" MSR HP DRAIN TANK GO TO FWHE-6B SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-014

SENSING ELEMENT: HD-50-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0298

INDICATED CONDITION:

- o MSR HIGH PRESSURE DRAIN TANK "D" LEVEL >4" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-46-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL MSR HIGH PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER OPERATION OF MSR "D" DUMP VALVE, HDV-248.
- o VERIFY PROPER OPERATION OF MSR "D" LEVEL CONTROL VALVE HDV-12

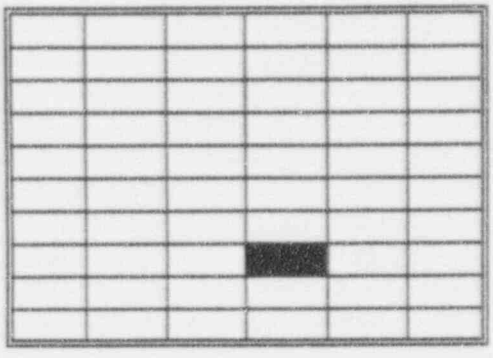
DISCUSSION:

DRAINS FROM THE "D" MSR HP DRAIN TANK GO TO FWHE-6B SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-015

SENSING ELEMENT: HD-46-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0299

INDICATED CONDITION:

o MSR LOW PRESSURE DRAIN TANK "A" LEVEL **>135'5/8"** AS SENSED BY HD-47-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL MSR LOW PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF MSR "A" DUMP VALVE, HDV-37.
o VERIFY PROPER OPERATION OF MSR "A" LEVEL CONTROL VALVE HDV-33.

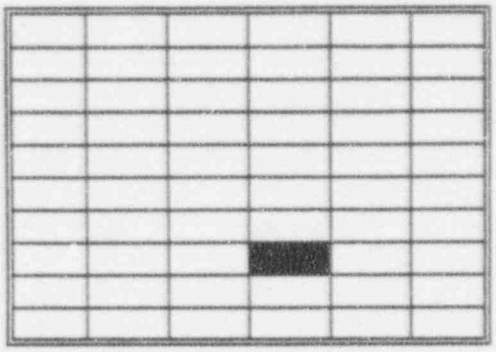
DISCUSSION:

DRAINS FROM THE "A" MSR LP DRAIN TANK GO TO FWHE-5A SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-017

SENSING ELEMENT: HD-47-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0300

INDICATED CONDITION:

o MSR LOW PRESSURE DRAIN TANK "B" LEVEL **>135'5/8"** AS SENSED BY HD-43-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL MSR LOW PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF MSR "B" DUMP VALVE, HDV-38.
o VERIFY PROPER OPERATION OF MSR "B" LEVEL CONTROL VALVE HDV-34.

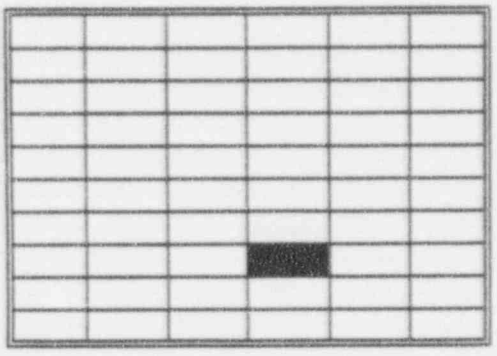
DISCUSSION:

DRAINS FROM THE "B" MSR LP DRAIN TANK GO TO FWHE-5A SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-017

SENSING ELEMENT: HD-43-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0301

INDICATED CONDITION:

o MSR LOW PRESSURE DRAIN TANK "C" LEVEL **>135'5/8"** AS SENSED BY HD-49-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

ó LOCAL MSR LOW PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF MSR "C" DUMP VALVE, HDV-39.
o VERIFY PROPER OPERATION OF MSR "C" LEVEL CONTROL VALVE HDV-35.

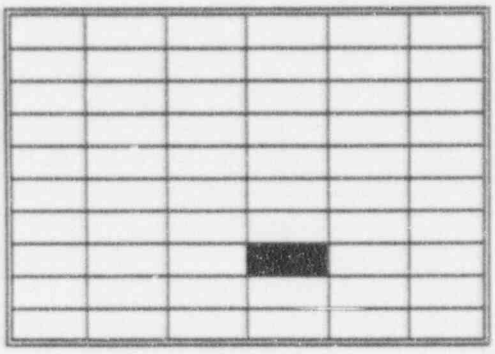
DISCUSSION:

DRAINS FROM THE "C" MSR LP DRAIN TANK GO TO FWHE-5B SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-018

SENSING ELEMENT: HD-49-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-04-08	N-04-08



RHTR DRN AND FLASH TNK LEVEL HIGH

EVENT POINT 0302

INDICATED CONDITION:

o MSR LOW PRESSURE DRAIN TANK "D" LEVEL **>135'5/8"** AS SENSED BY HD-45-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL MSR LOW PRESSURE DRAIN TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER OPERATION OF MSR "D" DUMP VALVE, HDV-40.
o VERIFY PROPER OPERATION OF MSR "D" LEVEL CONTROL VALVE HDV-36.

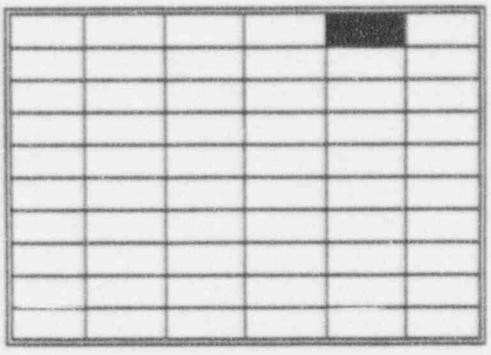
DISCUSSION:

DRAINS FROM THE "D" MSR LP DRAIN TANK GO TO FWHE-5B SHELL SIDE.

REFERENCES: DRAWING 208-065 SHEET HD-018

SENSING ELEMENT: HD-45-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-01	N-05-01



**CDSTE HTR 2A/B
LEVEL
HIGH**

EVENT POINT 0272

INDICATED CONDITION:

o CONDENSATE HEATER 2. LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-24-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o CDHE-2A LOCAL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY HEATER DUMP VALVE, HDV-113 OPEN.
o VERIFY HEATER CONTROL VALVE, HDV-111 OPEN.

DISCUSSION:

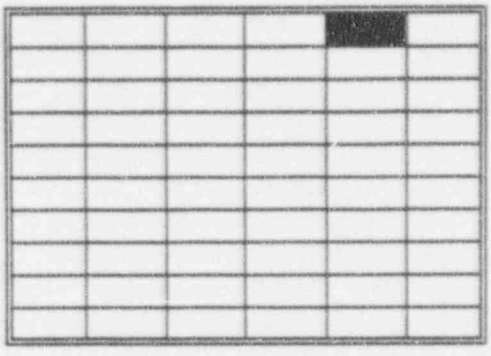
A HIGH-HIGH LEVEL IN CDHE-2A WILL TRIP THE TURBINE.

CDHE-2A HAS NO EXTRACTION NON-RETURN VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-05

SENSING ELEMENT: HD-24-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-01	N-05-01



CDSTE HTR 2A/B LEVEL HIGH

EVENT POINT 0275

INDICATED CONDITION:

- o CONDENSATE HEATER 2B LEVEL >8.3" ABOVE NORMAL WATER LEVEL AS SENSED BY HD-26-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CDHE-2B LOCAL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY HEATER DUMP VALVE, HDV-114 OPEN.
- o VERIFY HEATER CONTROL VALVE, HDV-112 OPEN.

DISCUSSION:

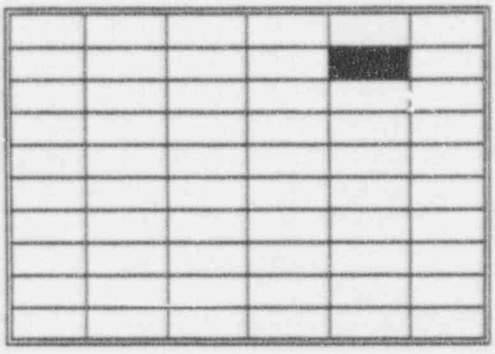
A HIGH-HIGH LEVEL IN CDHE-2B WILL TRIP THE TURBINE.

CDHE-2B HAS NO EXTRACTION NON-RETURN VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-05

SENSING ELEMENT: HD-26-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-02	N-05-02



**CNDSTE HTR 2A/B
DUMP VALVES
NOT FULL CLOSED**

EVENT POINT 0273

INDICATED CONDITION:

o CONDENSATE HEATER 2A DUMP VALVE, HDV-113 NOT FULL CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL VALVE POSITION.
o CDHE-2A LEVEL HIGH.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER CDHE-2A LEVEL CONTROL VALVE, HDV-111 OPERATION.

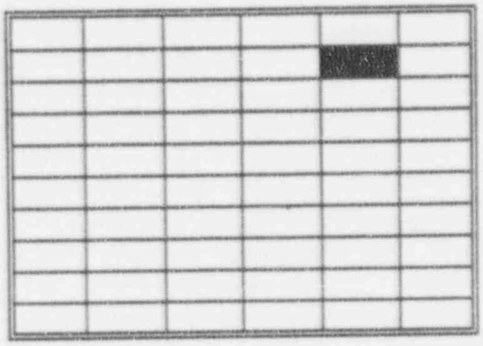
DISCUSSION:

A HIGH LEVEL IN CDHE-2A WILL OPEN THE DUMP VALVE.
A TURBINE TRIP AS SENSED BY LOW AUTO-STOP OIL PRESSURE WILL OPEN THE DUMP VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-05

SENSING ELEMENT: CLOSED CONTACT ON VALVE.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-02	N-05-02



**CNDSTE HTR 2A/B
DUMP VALVES
NOT FULL CLOSED**

EVENT POINT 0276

INDICATED CONDITION:

o CONDENSATE HEATER 2B DUMP VALVE, HDV-114 NOT FULL CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL VALVE POSITION.
o CDHE-2B LEVEL HIGH.

OPERATOR ACTIONS FOR A VALID ALARM:

o VERIFY PROPER CDHE-2B LEVEL CONTROL VALVE, HDV-112 OPERATION.

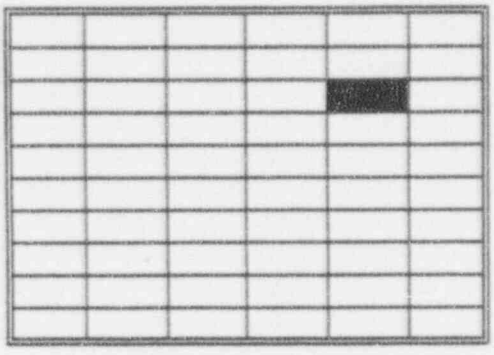
DISCUSSION:

A HIGH LEVEL IN CDHE-2B WILL OPEN THE DUMP VALVE.
A TURBINE TRIP AS SENSED BY LOW AUTO-STOP OIL PRESSURE WILL OPEN THE DUMP VALVE.

REFERENCES: DRAWING 208-065 SHEET HD-05

SENSING ELEMENT: CLOSED CONTACT ON VALVE.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-03	N-05-03



DEAERATOR LEVEL HIGH-HIGH

EVENT POINT 0303

INDICATED CONDITION:

o DEAERATOR DUMP VALVE HDV-83, NOT FULL CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o DEAERATOR LEVEL INDICATION READS >12' 3 1/2".
o LOCAL DEAERATOR SIGHTGLASS LEVEL.
o CASCADE DRAIN VALVES TO THE DEAERATOR, HDV-53 AND HDV-54 CLOSE.

OPERATOR ACTIONS FOR A VALID ALARM:

o REDUCE CONDENSATE FLOW TO THE DEAERATOR.
o VERIFY DEAERATOR LEVEL IS DECREASING.

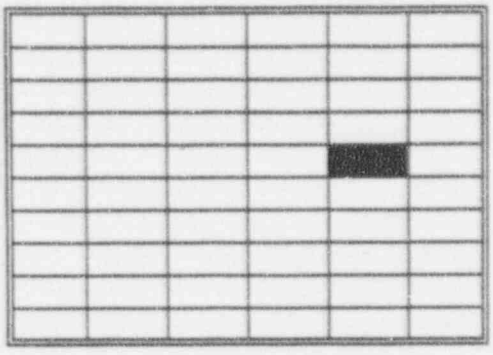
DISCUSSION:

THIS ALARM DOES NOT ACTUATE ON HIGH DEAERATOR LEVEL IT ONLY COMES OFF OF HDV-83 POSITION.

REFERENCES: DRAWING 208-065 SHEET HD-08

SENSING ELEMENT: HDV-83 CLOSED LIMIT SWITCH

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-05	N-05-05



FW HTR 3/5/6
LEVEL
LOW

EVENT POINT 0277

INDICATED CONDITION:

o CONDENSATE HEATER 3A LEVEL IS **LOWER THAN 1.5"** BELOW NORMAL WATER LEVEL AS SENSED BY HD-175-LS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

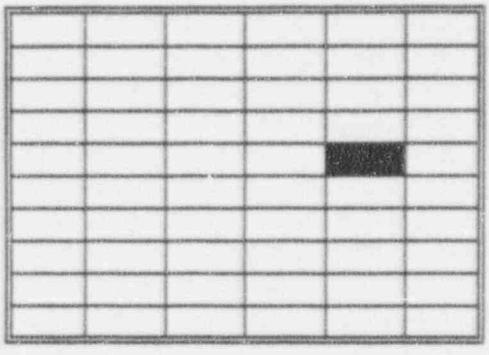
o VERIFY HEATER DUMP VALVE, HDV-123 CLOSED.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-119.

DISCUSSION:

REFERENCES: DRAWING 208-065 SHEET HD-07

SENSING ELEMENT: HD-175-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-05	N-05-05



FW HTR 3/5/6
LEVEL
LOW

EVENT POINT 0280

INDICATED CONDITION:

o CONDENSATE HEATER 3B LEVEL IS **LOWER THAN 1.5"** BELOW NORMAL WATER LEVEL AS SENSED BY HD-176-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

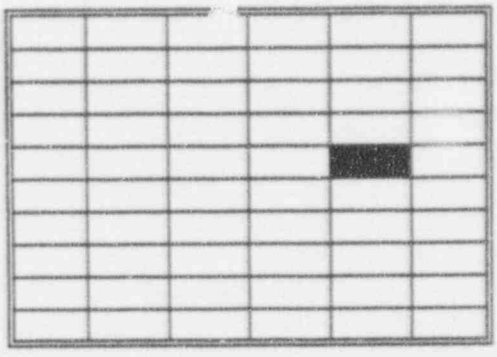
o VERIFY HEATER DUMP VALVE, HDV-124 CLOSED.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-120.

DISCUSSION:

REFERENCES: DRAWING 208-065 SHEET HD-07

SENSING ELEMENT: HD-176-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-05	N-05-05



FW HTR 3/5/6
LEVEL
LOW

EVENT POINT 0283

INDICATED CONDITION:

- o FEEDWATER HEATER 5A LEVEL IS **LOWER THAN 2.5"** BELOW NORMAL WATER LEVEL AS SENSED BY HD-177-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

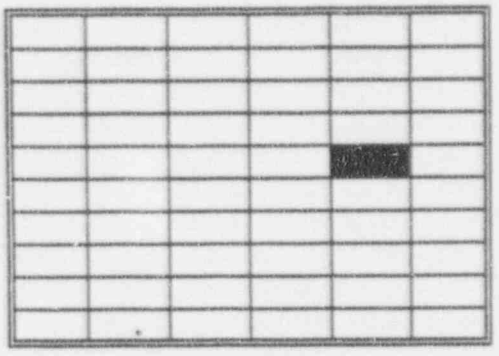
- o VERIFY HEATER DUMP VALVE, HDV-55 CLOSED.
- o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-53.

DISCUSSION:

REFERENCES: DRAWING 208-065 SHEET HD-09

SENSING ELEMENT: HD-177-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-05	N-05-05



FW HTR 3/5/6
LEVEL
LOW

EVENT POINT 0286

INDICATED CONDITION:

o FEEDWATER HEATER 5B LEVEL IS **LOWER THAN 2.5"** BELOW NORMAL WATER LEVEL AS SENSED BY HD-178-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

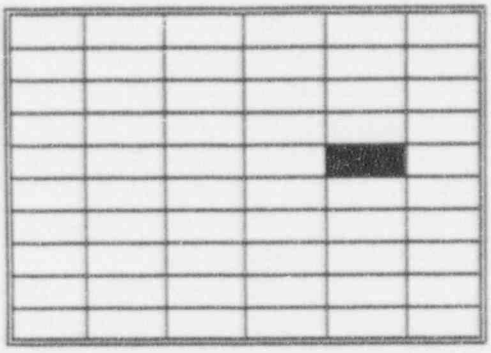
o VERIFY HEATER DUMP VALVE, HDV-56 CLOSED.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-54.

DISCUSSION:

REFERENCES: DRAWING 208-065 SHEET HD-09

SENSING ELEMENT: HD-178-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-05	N-05-05



FW HTR 3/5/6
LEVEL
LOW

EVENT POINT 0289

INDICATED CONDITION:

o FEEDWATER HEATER 6A LEVEL IS **LOWER THAN 2"** BELOW NORMAL WATER LEVEL AS SENSED BY HD-179-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

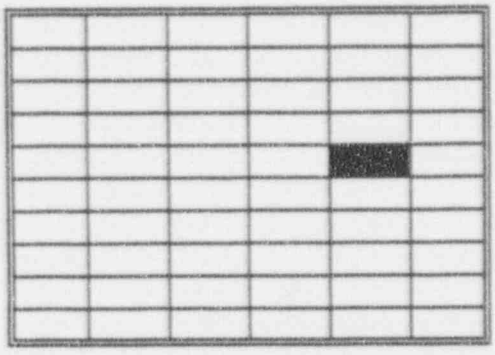
o VERIFY HEATER DUMP VALVE, HDV-63 CLOSED.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-61.

DISCUSSION:

REFERENCES: DRAWING 208-065 SHEET HD-11

SENSING ELEMENT: HD-179-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-05	N-05-05



FW HTR 3/5/6
LEVEL
LOW

EVENT POINT 0292

INDICATED CONDITION:

o FEEDWATER HEATER 6B LEVEL IS **LOWER THAN 2"** BELOW NORMAL WATER LEVEL AS SENSED BY HD-180-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL HEATER LEVEL SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

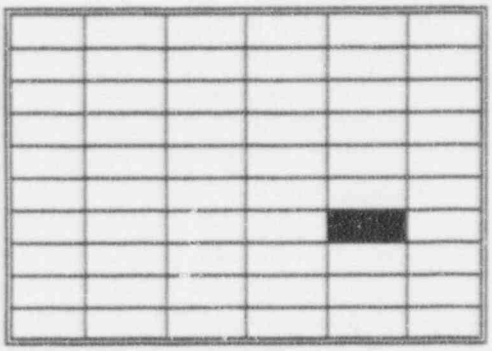
o VERIFY HEATER DUMP VALVE, HDV-64 CLOSED.
o VERIFY PROPER OPERATION OF HEATER LEVEL CONTROL VALVE, HDV-62.

DISCUSSION:

REFERENCES: DRAWING 208-065 SHEET HD-11

SENSING ELEMENT: HD-180-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-07	N-05-07



MS VLV TO AS/DEATR NOT FULL OPEN

EVENT POINT 0957

INDICATED CONDITION:

- o MAIN STEAM SUPPLY TO AUXILIARY STEAM ISOLATION VALVE MSV-179, NOT FULL OPEN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o VALVE POSITION INDICATION.
- o LOCAL VALVE POSITION.

OPERATOR ACTIONS FOR A VALID ALARM:

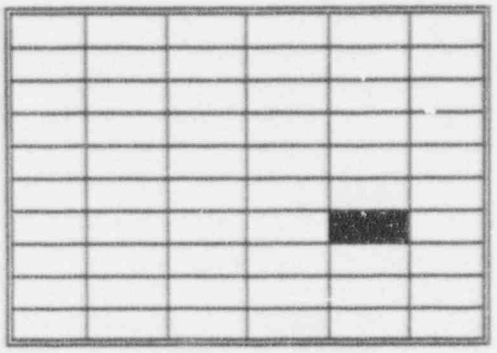
- o IF PLANT CONDITIONS REQUIRE MSV-179 TO BE OPENED THEN OPEN MSV-179.

DISCUSSION:

REFERENCES: DRAWING 208-039 SHEET MS-15

SENSING ELEMENT: VALVE OPEN CONTACTS.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-05-07	N-05-07



MS VLV TO
AS/DEATR
NOT FULL OPEN

EVENT POINT 0958

INDICATED CONDITION:

- o MAIN STEAM SUPPLY TO THE DEAERATOR ISOLATION VALVE MSV-180, NOT FULL OPEN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o VALVE POSITION INDICATION.
- o LOCAL VALVE POSITION.

OPERATOR ACTIONS FOR A VALID ALARM:

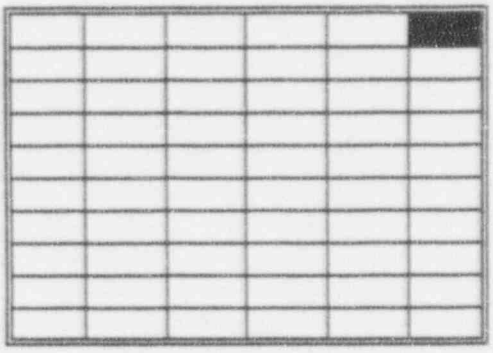
- o IF PLANT CONDITIONS REQUIRE MSV-180 TO BE OPENED THEN OPEN MSV-180.

DISCUSSION:

REFERENCES: DRAWING 208-039 SHEET MS-16

SENSING ELEMENT: VALVE OPEN CONTACTS.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-01	N-06-01



EH FLUID PUMP TRIP

EVENT POINT 1600

INDICATED CONDITION:

- o TBP-7A BREAKER OPEN WITH CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH RED FLAG ON TBP-7A CONTROL STATION.
- o EH SYSTEM PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE TBP-7B IS RUNNING.
- o INVESTIGATE CAUSE OF TBP-7A TRIP.

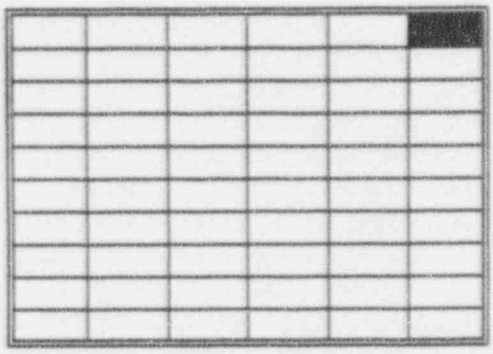
DISCUSSION:

IF NO EHC PUMPS CAN BE STARTED THEN CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE MAIN TURBINE.
A LOW-LOW LEVEL IN THE EHC TANK WILL TRIP THE EHC LOCKOUT RELAY WHICH WILL TRIP BOTH EHC PUMPS AND PREVENT THEIR RESTART UNTIL THE LOCKOUT IS RESET.

REFERENCES: DRAWING 208-057 SHEET TB-01

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-01	N-06-01



EH FLUID PUMP TRIP

EVENT POINT 1602

INDICATED CONDITION:

- o TBP-7B BREAKER OPEN WITH CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH RED FLAG ON TBP-7B CONTROL STATION.
- o EH SYSTEM PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE TBP-7A IS RUNNING.
- o INVESTIGATE CAUSE OF TBP-7B TRIP.

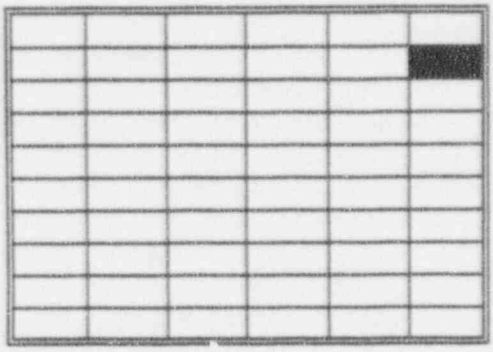
DISCUSSION:

IF NO EHC PUMPS CAN BE STARTED THEN CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE MAIN TURBINE.
A LOW-LOW LEVEL IN THE EHC TANK WILL TRIP THE EHC LOCKOUT RELAY WHICH WILL TRIP BOTH EHC PUMPS AND PREVENT THEIR RESTART UNTIL THE LOCKOUT IS RESET.

REFERENCES: DRAWING 208-057 SHEET TB-02

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-02	N-06-02



EH FLUID
SUPPLY PRESS
LOW

EVENT POINT 1609

INDICATED CONDITION:

o EHC SUPPLY PRESSURE <1600 **PSIG** AS SENSED BY TB-243-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o EH SUPPLY PRESSURE INDICATOR TB-240-PI (MCB).
o LOCAL EH SUPPLY PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o PLACE STANDBY EHC PUMP IN SERVICE.
o INVESTIGATE THE LOW PRESSURE CONDITION.

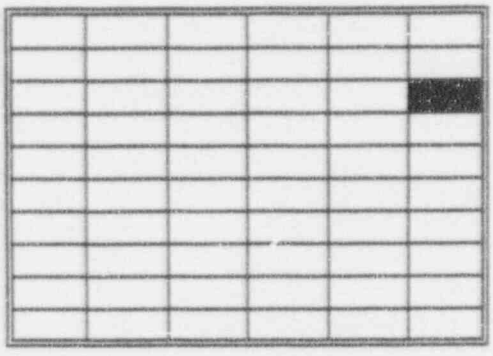
DISCUSSION:

STANDBY EHC PUMP SHOULD AUTO START WHEN EHC PRESSURE DROPS TO <1350 **PSIG**.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-243-PS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-03	N-06-03



EH FLUID TANK LEVEL LOW

EVENT POINT 1605

INDICATED CONDITION:

o EH FLUID TANK LEVEL <17.25" AS SENSED BY TB-236-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o ADD EH FLUID TO EH TANK TO RAISE LEVEL.
o INVESTIGATE EH SYSTEM FOR LEAKS.

DISCUSSION:

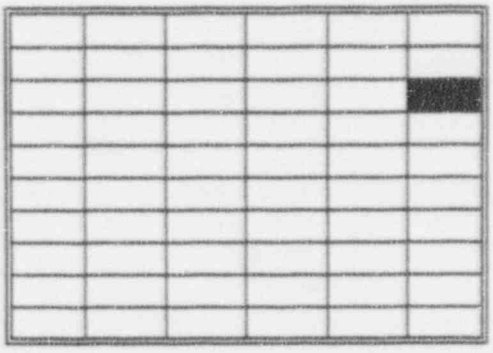
THIS LEVEL SWITCH ALSO FEEDS THE INPUT TO THE EH FLUID LOCKOUT RELAY WHICH ACTUATES AT 7 5/8" TANK LEVEL TRIPPING AND LOCKING OUT TBP-7A AND TBP-7B.

THE LOCKOUT CAN BE DEFEATED BY TURNING THE LOCKOUT DC POWER OFF AND THEN RESETTING THE LOCKOUT ("TURBINE GENERATOR REAR" - MCB). DO NOT HOLD A LOCKOUT IN THE RESET POSITION WITH A STANDING TRIP SIGNAL PRESENT. THIS ACTION WILL BURN OUT THE RELAY COIL.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-236-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-03	N-06-03



EH FLUID
TANK LEVEL
LOW

EVENT POINT 1606

INDICATED CONDITION:

o EH FLUID TANK LEVEL <11 5/8" AS SENSED BY TB-235-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL TANK LEVEL INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o ADD EH FLUID TO EH TANK.
o INVESTIGATE EH SYSTEM FOR LEAKS.

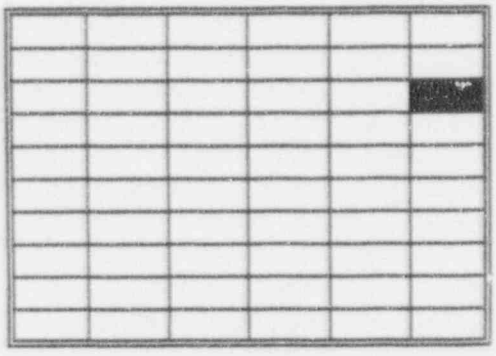
DISCUSSION:

EHC LOW LEVEL LOCKOUT OF TBP-7A AND TBP-7B WILL OCCUR WHEN EH TANK DROPS TO <7 5/8".

REFERENCES: DRAWING 208-057 SHEET TO 16

SENSING ELEMENT: TB-235-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-03	N-06-03



**EH FLUID
TANK LEVEL
LOW**

EVENT POINT 1607

INDICATED CONDITION:

- o EHC LOW LEVEL LOCKOUT HAS ACTUATED CAUSED BY EH FLUID TANK LEVEL <7 5/8" AS SENSED BY TB-236-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL TANK LEVEL INDICATOR.
- o BOTH EHC PUMPS TRIP AND WILL NOT RESTART.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE TURBINE.
- o ADD EH FLUID TO EH TANK.
- o INVESTIGATE EH SYSTEM FOR LEAKS.

DISCUSSION:

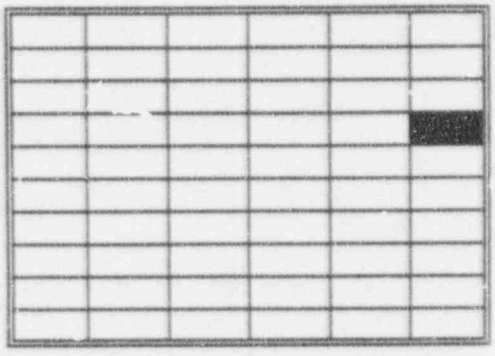
THIS LEVEL SWITCH ALSO FEEDS THE INPUT TO THE EH FLUID LOCKOUT RELAY WHICH ACTUATES AT 7 5/8" TANK LEVEL TRIPPING AND LOCKING OUT TBP-7A AND TBP-7B.

THE LOCKOUT CAN BE DEFEATED BY TURNING THE LOCKOUT DC POWER OFF AND THEN RESETTING THE LOCKOUT ("TURBINE GENERATOR REAR" - MCB). DO NOT HOLD A LOCKOUT IN THE RESET POSITION WITH A STANDING TRIP SIGNAL PRESENT. THIS ACTION WILL BURN OUT THE RELAY COIL.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-236-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-04	N-06-04



**TURB EHC
ON MANUAL**

EVENT POINT 1238

INDICATED CONDITION:

o TURBINE CONTROL NOT IN "OPERATOR ICS".

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o UNIT IS IN TRACK
o INDICATION TURBINE CONTROL PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

o DETERMINE NEED FOR TURBINE TO BE NOT IN ICS AUTO.
o PLACE TURBINE IN AUTO.

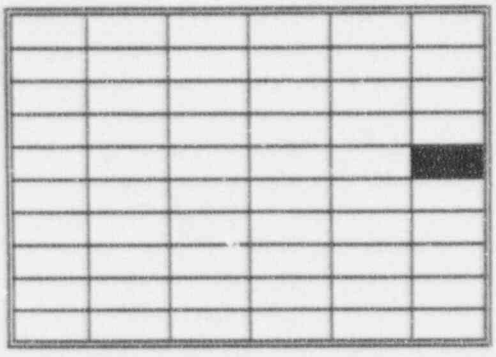
DISCUSSION:

TURBINE SHIFTS TO MANUAL IF ANY OF THE FOLLOWING OCCURS: TURBINE TRIP, HEADER PRESSURE ERROR OF +/- 50 PSIG, SPEED REFERENCE FAILURE, LOAD REFERENCE FAILURE, AUXILIARY SPEED CHANNEL FAILURE, MAIN SPEED CHANNEL FAILURE.

REFERENCES: ICS DRAWINGS

SENSING ELEMENT: CONTACTS IN THE ICS SYSTEM

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-05	N-06-05



EH FLUID PUMP AUTO START

EVENT POINT 1601

INDICATED CONDITION:

- o TBP-7A BREAKER CLOSED AND CONTROL STATION IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON AND GREEN FLAG ON TBP-7A CONTROL STATION.
- o EH FLUID PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF TBP-7A AUTO START.
- o VERIFY PROPER EH FLUID PRESSURE.

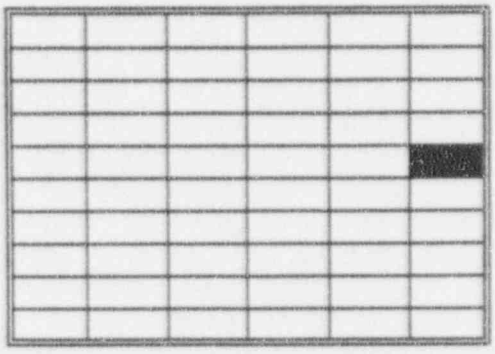
DISCUSSION:

STANDBY EHC PUMPS WILL AUTO START WHEN EH SYSTEM PRESSURE DROPS TO **<1350 PSIG**.

REFERENCES: DRAWING 208-057 SHEET TB-01

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-05	N-06-05



EH FLUID PUMP AUTO START

EVENT POINT 1603

INDICATED CONDITION:

- o TBP-7B BREAKER CLOSED AND CONTROL STATION IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT ON AND GREEN FLAG ON TBP-7B CONTROL STATION.
- o EH FLUID PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF TBP-7B AUTO START.
- o VERIFY PROPER EH FLUID PRESSURE.

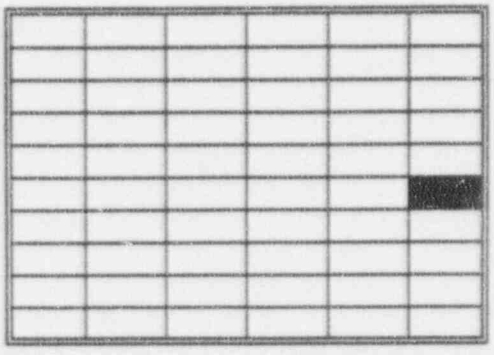
DISCUSSION:

STANDBY EHC PUMPS WILL AUTO START WHEN EH SYSTEM PRESSURE DROPS TO **<1350 PSIG**.

REFERENCES: DRAWING 208-057 SHEET TB-02

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-06	N-06-06



EH FLUID SYSTEM TROUBLE

EVENT POINT 1604

INDICATED CONDITION:

o EH FLUID TANK LEVEL >22" AS SENSED BY TB-235-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o LOCAL TANK INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF HIGH LEVEL.
o HAVE CHEMISTRY SAMPLE THE EH FLUID FOR EVIDENCE OF WATER.
o DRAIN FLUID AS NECESSARY.

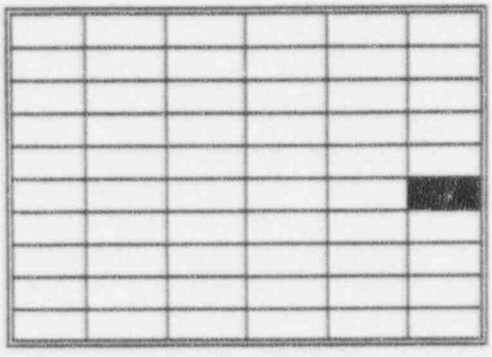
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN THE TURBINE TRIPS.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-235-LS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-06	N-06-06



EH FLUID SYSTEM TROUBLE

EVENT POINT 1608

INDICATED CONDITION:

o EH FLUID SYSTEM PRESSURE **>2200 PSIG** AS SENSED BY TB-239-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o EH SYSTEM PRESSURE INDICATION TB-240-PI.
o LOCAL EH SYSTEM PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF HIGH PRESSURE.
o CONTACT I&C SHOP REGARDING THE HIGH PRESSURE CONDITION.
o PLACE STANDBY EHC PUMP IN SERVICE.

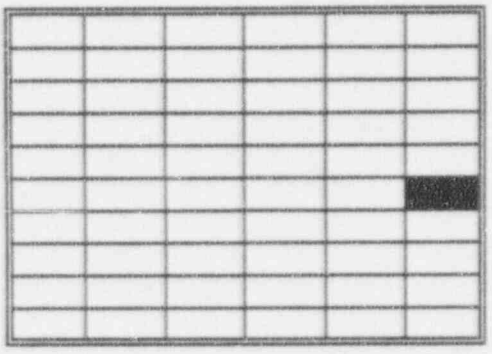
DISCUSSION:

THIS ALARM MAY INDICATE A CLOGGED EH PUMP DISCHARGE FILTER, AND/OR A FAILED CLOSED UNLOADER VALVE.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-239-PS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-06	N-06-06



EH FLUID SYSTEM TROUBLE

EVENT POINT 1610

INDICATED CONDITION:

o EH FLUID SYSTEM DRAIN RETURN PRESSURE **>30 PSIG** AS SENSED BY TB-237-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o EH SYSTEM PRESSURE INDICATION TB-240-PI.
o LOCAL EH SYSTEM PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF HIGH PRESSURE.
o CONTACT I&C SHOP REGARDING THE HIGH PRESSURE CONDITION.
o PLACE STANDBY EHC FILTER/COOLER IN SERVICE.

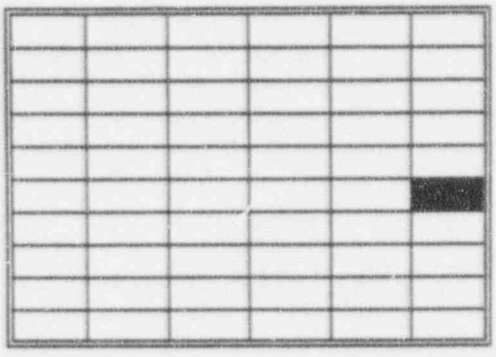
DISCUSSION:

THIS ALARM MAY INDICATE A CLOGGED EH PUMP DRAIN FILTER OR COOLER.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-237-PS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-06	N-06-06



EH FLUID SYSTEM TROUBLE

EVENT POINT 1611

INDICATED CONDITION:

- o TBP-7A DISCHARGE FILTER ΔP **>100 PSID** AS SENSED BY TB-231-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o EH SYSTEM PRESSURE INDICATION TB-240-PI.
- o LOCAL EH SYSTEM PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF HIGH PRESSURE.
- o PLACE TBP-7B PUMP IN SERVICE.
- o CONTACT I&C SHOP REGARDING THE HIGH PRESSURE CONDITION.
- o CHANGE OUT EHC DISCHARGE FILTER.

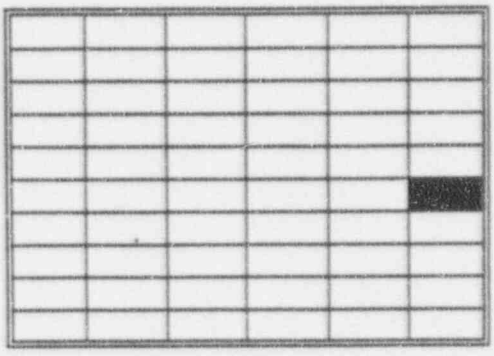
DISCUSSION:

THIS FILTER IS ON THE DISCHARGE OF TBP-7A, AND IS LOCATED IN THE EH PUMP MANIFOLD BLOCK ON THE TOP OF THE EH RESERVOIR.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-231-PS

TGF-N ANNUNCIATOR RESPONSE	TGF-AX2-06-06	N-06-06



EH FLUID SYSTEM TROUBLE

EVENT POINT 1612

INDICATED CONDITION:

o TBP-7B DISCHARGE FILTER ΔP **>100 PSID** AS SENSED BY TB-232-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

o EH SYSTEM PRESSURE INDICATION TB-240-PI.
o LOCAL EH SYSTEM PRESSURE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

o INVESTIGATE CAUSE OF HIGH PRESSURE.
o PLACE STANDBY PUMP AND FILTER IN SERVICE.
o CONTACT I&C SHOP REGARDING THE HIGH PRESSURE CONDITION.
o CHANGE OUT EHC DISCHARGE FILTER.

DISCUSSION:

THIS FILTER IS ON THE DISCHARGE OF TBP-7B, AND IS LOCATED IN THE EH PUMP MANIFOLD BLOCK ON THE TOP OF THE EH RESERVOIR.

REFERENCES: DRAWING 208-057 SHEET TB-16

SENSING ELEMENT: TB-232-PS

Rev. 9 04/08/93

Effective Date 4/14/93

Document Section
INFORMATION ONLY
C. R. Nuclear

ANNUNCIATOR RESPONSE

AR-603

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

TGF O ANNUNCIATOR RESPONSE

THIS PROCEDURE ADDRESSES SAFETY RELATED COMPONENTS

APPROVED BY: Interpretation Contact

W. Marshall

DATE: 4/13/93

INTERPRETATION CONTACT: Manager, Nuclear Plant Operations

TABLE OF CONTENTS

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ENCLOSURE

1	Annunciator Response	3

1.0 PURPOSE

1.1 Establish a reference document for each Annunciator Window on the TGF-AX3 Lampbox.

1.2 Establish operator actions for valid Annunciator alarms on the TGF-AX3 Lampbox.

1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the TGF-AX3 Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

2.1.1 AP-660, Turbine Trip

2.1.2 OP-607, Condenser Vacuum System

2.1.3 AP-450, Emergency Feedwater Actuation

2.1.4 OP-701, Operation of the Main Electrical Generator Systems

2.1.5 AR-921, Hydrogen Panel Annunciator Response

2.1.6 AP-580, Reactor Trip

2.1.7 OP-203, Plant Startup

2.1.8 OP-204, Power Operations

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-224-049

3.0 PERSONNEL INDOCTRINATION

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

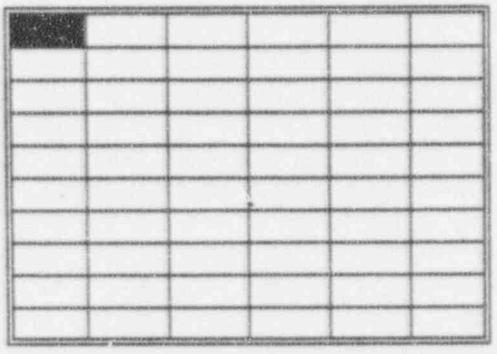
4.0 INSTRUCTIONS

4.1 Respond to alarms on the TGF-AX3 Lampbox as indicated on Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP ACTIONS

None

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-01-01	0-01-01



**TURB GEN
BRG OIL PUMP
TRIP**

EVENT POINT 1614

INDICATED CONDITION:

- TBP-2 BREAKER OPEN WITH CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

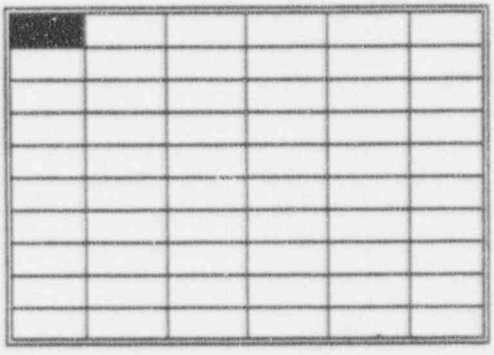
- ENSURE TBP-3 STARTS.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-03

SENSING ELEMENT: CS/SC, CS/O,(CONTROL STATION CONTACTS) 42B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-01	O-01-01



**TURB GEN
BRG OIL PUMP
TRIP**

EVENT POINT 1618

INDICATED CONDITION:

- TBP-3 DC STARTER OPEN WITH CONTROL HANDLE IN NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

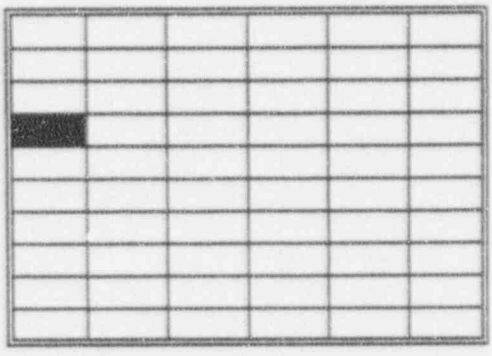
- ENSURE TBP-2 AUTO STARTS
- ENSURE TBP-8 AUTO STARTS

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-12

SENSING ELEMENT: CS/SC, CS/O CONTROL STATION CONTACTS, 42X STARTER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-04	O-01-04



TURB GEN
BRG OIL PUMP
AUTO START

EVENT POINT 1613

INDICATED CONDITION:

- TBP-2 BREAKER CLOSED WITH CONTROL HANDLE IN NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED LIGHT IS ON WITH A GREEN FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF OIL PUMP AUTO START.
- CHECK MAIN LUBE OIL PRESSURE.

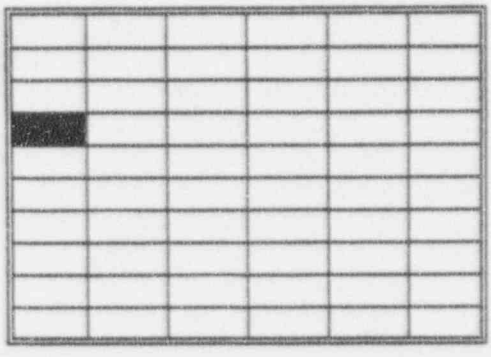
DISCUSSION:

LUBE OIL PRESSURE <12 PSIG AS SENSED BY TB-254-PS AUTO STARTS TPB-2

REFERENCES: DRAWING 208-057 TB-03

SENSING ELEMENT: CS/ST, CS/O CONTROL STATION CONTACTS, 42A BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-04	O-01-04



**TURB GEN
BRG OIL PUMP
AUTO START**

EVENT POINT 1617

INDICATED CONDITION:

- TBP-3 STARTER CLOSED WITH CONTROL HANDLE IN NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED LIGHT IS ON WITH A GREEN FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF OIL PUMP AUTO START.
- CHECK MAIN LUBE OIL PRESSURE.

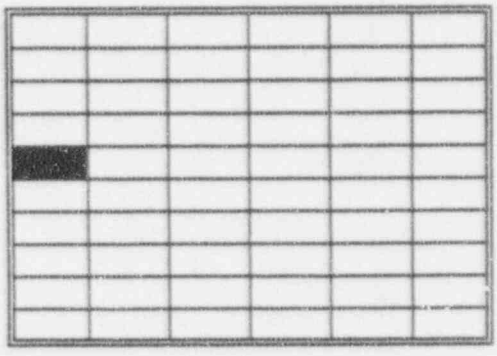
DISCUSSION:

LUBE OIL PRESSURE <10 PSIG AS SENSED BY TB-253-PS AUTO STARTS TPB-3

REFERENCES: DRAWING 208-057 TB-12

SENSING ELEMENT: CS/ST, CS/O CONTROL STATION CONTACTS, 42X STARTER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-05	0-01-05



HP SEAL OIL BACKUP PUMP TRIP

EVENT POINT 1616

INDICATED CONDITION:

- TBP-8 BREAKER OPEN WITH CONTROL HANDLE IN NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

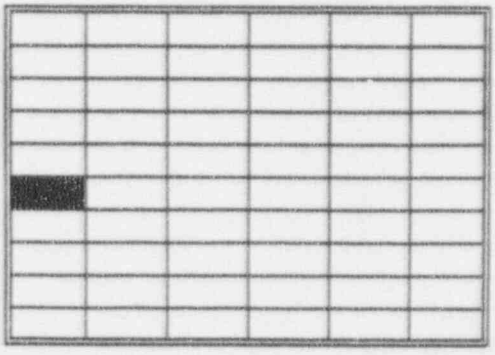
- ENSURE EITHER TBP-2 OR TBP-3, AND TBP-4 ARE RUNNING.
- ENSURE TBP-5 OR TBP-10 IS RUNNING.
- INVESTIGATE CAUSE OF TBP-8 TRIP.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-04

SENSING ELEMENT: CS/ST, CS/O CONTROL STATION CONTACTS, 42B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-06	O-01-06



HP SEAL OIL BACKUP PUMP AUTO START

EVENT POINT 1615

INDICATED CONDITION:

- TBP-8 BREAKER CLOSED WITH CONTROL HANDLE IN NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED LIGHT IS ON WITH A GREEN FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF TBP-8 AUTO START.
- CHECK OPERATION OF RUNNING TURBINE GENERATOR OIL AND SEAL OIL PUMP(S).
- CHECK MAIN LUBE OIL PRESSURE.

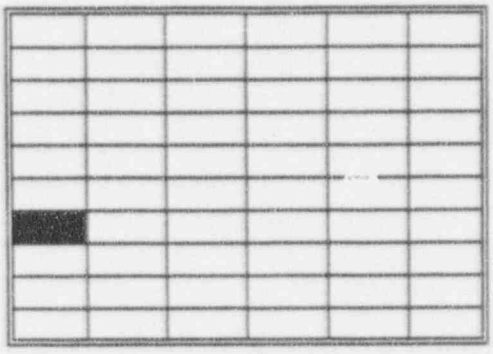
DISCUSSION:

SEAL OIL PRESSURE <10 PSIG AS SENSED BY TB-254-PS AUTO STARTS HIGH PRESSURE SEAL OIL BACK-UP PUMP

REFERENCES: DRAWING 208-057 TB-04

SENSING ELEMENT: CS/ST, CS/O CONTROL STATION CONTACTS, 42A BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	O-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0310

INDICATED CONDITION:

- MAIN TURBINE LUBE OIL PURIFIER OVERFLOW CHAMBER LEVEL HIGH AS SENSED BY LO-41-LS2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF HIGH OIL LEVEL.

DISCUSSION:

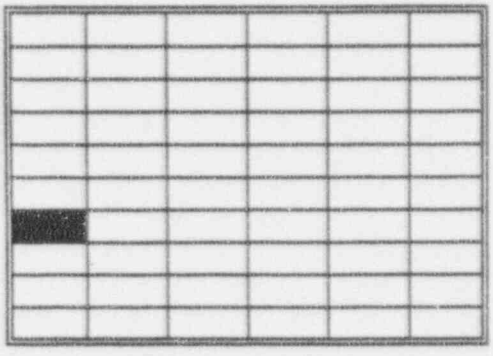
LUBE OIL IS PROCESSED THROUGH SEVERAL PARALLEL FILTER BAGS. OIL IS FED TO THESE FILTER BAGS THROUGH NOZZLES WHICH CAN PIVOT FOR MAINTENANCE. THESE PIVOT JOINTS ARE SEALED WITH O-RINGS THAT SOMETIMES LEAKBY. LEAKAGE AT THIS JOINT WILL FILL THE OVERFLOW CHAMBER.

THE LUBE OIL PURIFIER INLET VALVE (LOV-66) CLOSES WHEN THIS EVENT POINT IS RECEIVED.

REFERENCES: DRAWING 208-038 LO-06

SENSING ELEMENT: LO-41-LS2

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	0-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0311

INDICATED CONDITION:

- LOP-1 TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF PUMP TRIP.

DISCUSSION:

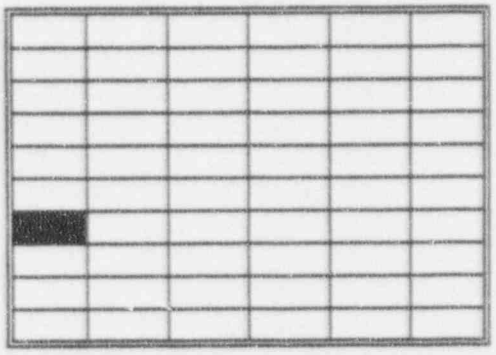
LOP-1 IS THE MAIN TURBINE LUBE OIL PURIFIER CIRCULATING PUMP.

MAIN PURIFIER OIL LEVEL IS SENSED BY LO-25-LS. ON A DECREASING LEVEL THIS SWITCH WILL OPEN DROPPING OUT 3LO-25-LS RELAY. THIS TRIPS LOP-1 AND WITH THE CONTROL HANDLE IN NORMAL AFTER START, WILL ALARM. THIS IS A COMMON CONDITION AFTER LOV-66 HAS CLOSED. LOP-2A AND LOP-2B ARE ALSO TRIPPED WITH A LOW PURIFIER OIL LEVEL.

REFERENCES: DRAWING 208-038 LO-01

SENSING ELEMENT: CS/SC,CS/O (CONTROL STATION CONTACTS) 42/B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	O-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0312

INDICATED CONDITION:

- LOP-2A TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF PUMP TRIP.

DISCUSSION:

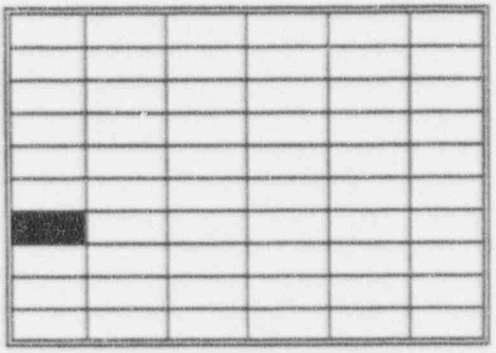
LOP-2A IS THE "A" FEED PUMP LUBE OIL PURIFIER CIRCULATING PUMP.

EITHER "A" FW TURBINE CONSOLE (AS SENSED BY 3FW-207-LS) INCREASING OIL LEVEL OR LOW PURIFIER OIL LEVEL (AS SENSED BY 3LO-25-LS) WILL TRIP LOP-2A. A HIGH CONSOLE OIL LEVEL MAY BE CAUSED BY A MISMATCH BETWEEN LOP-2A DISCHARGE FLOW AND THE RETURN DRAIN FLOW.

REFERENCES: DRAWING 208-038 LO-02

SENSING ELEMENT: CS/SC,CS/O (CONTROL STATION CONTACTS) 42/B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	O-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0313

INDICATED CONDITION:

- LOP-2B TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF PUMP TRIP.

DISCUSSION:

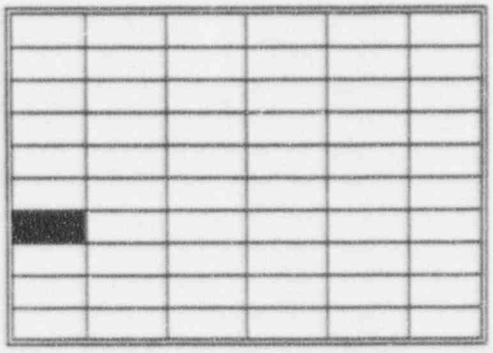
LOP-2B IS THE "B" FEED PUMP LUBE OIL PURIFIER CIRCULATING PUMP.

EITHER "B" FW TURBINE CONSOLE (AS SENSED BY 3FW-208-LS) INCREASING OIL LEVEL OR LOW PURIFIER OIL LEVEL (AS SENSED BY 3LO-25-LS) WILL TRIP LOP-2B. A HIGH CONSOLE OIL LEVEL MAY BE CAUSED BY A MISMATCH BETWEEN LOP-2B DISCHARGE FLOW AND THE RETURN DRAIN FLOW.

REFERENCES: DRAWING 208-038 LO-03

SENSING ELEMENT: CS/[illegible],CS/O (CONTROL STATION CONTACTS) 42/B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	O-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0315

INDICATED CONDITION:

- LOF-1 TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF FAN TRIP.

DISCUSSION:

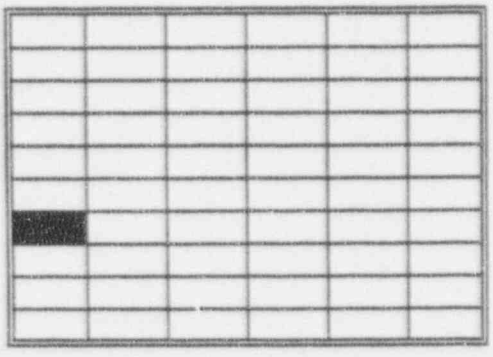
LOF-1 IS THE MAIN TURBINE LUBE OIL PURIFIER EXHAUSTER FAN.

THIS FAN NORMALLY RUNS CONTINUOUSLY AND HAS NO TRIPS OTHER THAN NORMAL BREAKER OVERCURRENT DEVICES. (INSTANTANEOUS AND THERMAL OVERLOAD)

REFERENCES: DRAWING 208-038 LO-05

SENSING ELEMENT: 52/B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	O-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0316

INDICATED CONDITION:

- MAIN TURBINE LUBE OIL PURIFIER LEVEL HIGH AS SENSED BY LO-24-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF HIGH LEVEL.

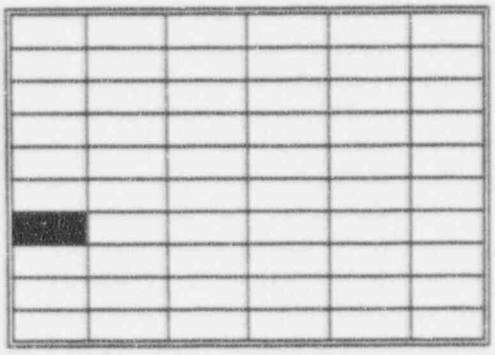
DISCUSSION:

THIS ALARM IS HIGH PURIFIER LEVEL ONLY. NO PUMP TRIPS ARE INVOLVED, NOR DOES LOV-66 TRIP CLOSED.

REFERENCES: DRAWING 208-038 LO-06

SENSING ELEMENT: LO-24-LS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	C-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0317

INDICATED CONDITION:

- FEEDWATER TURBINE LUBE OIL PURIFIER OVERFLOW CHAMBER LEVEL HIGH AS SENSED BY LO-41-LS1.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF HIGH OIL LEVEL.

DISCUSSION:

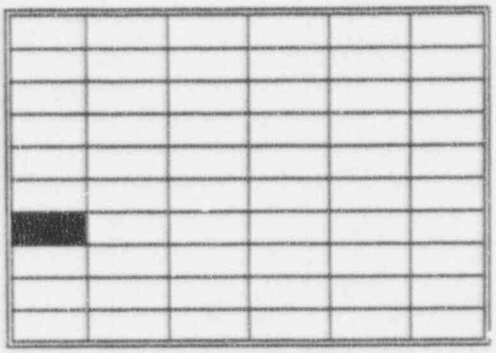
LUBE OIL IS PROCESSED THROUGH SEVERAL PARALLEL FILTER BAGS. OIL IS FED TO THESE FILTER BAGS THROUGH NOZZLES WHICH CAN PIVOT FOR MAINTENANCE. THESE PIVOT JOINTS ARE SEALED WITH O-RINGS THAT SOMETIMES LEAKBY. LEAKAGE AT THIS JOINT WILL FILL THE OVERFLOW CHAMBER.

THE LUBE OIL PURIFIER INLET VALVE (LOV-66) CLOSES WHEN THIS EVENT POINT IS RECEIVED.

REFERENCES: DRAWING 208-038 LO-06

SENSING ELEMENT: LO-41-LS1

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-01-07	0-01-07



**TURB GEN
LUBE OIL SYS
TROUBLE**

EVENT POINT 0318

INDICATED CONDITION:

- FEEDWATER TURBINE LUBE OIL PURIFIER OVERFLOW CHAMBER LEVEL LOW AS SENSED BY 3LO-25-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF LOW OIL LEVEL.

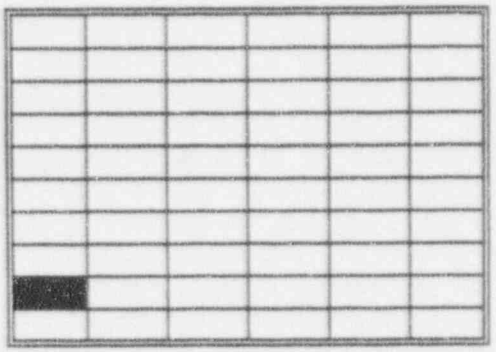
DISCUSSION:

LOP-1, LOP-2A, AND LOP-2B ARE TRIPPED BY THIS LEVEL SWITCH.

REFERENCES: DRAWING 208-038 LO-01

SENSING ELEMENT: 3LO-25-LS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-01-09	0-01-09



GLAND STEAM
DRN TNK LEVEL
LOW

EVENT POINT 1701

INDICATED CONDITION:

- GLAND STEAM CONDENSER DRAIN TANK LEVEL <9" AS SENSED BY TD-3-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO ENSURE TDV-40 CLOSED.

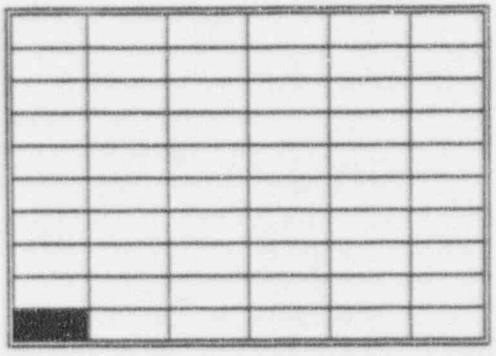
DISCUSSION:

A MAR HAS BEEN INSTALLED WHICH ADDED AN ADDITIONAL SOLENOID TO CLOSE TDV-40 WHEN THE LOW LEVEL ALARM IS RECEIVED. THE LEVEL SETPOINT IS MEASURED FROM PLANT DATUM WITH THE TURBINE BUILDING FLOOR AT THE 95' ELEVATION. IF TDV-40 IS STUCK OPEN, A POTENTIAL LOSS OF VACUUM CAN OCCUR.

REFERENCES: DRAWING 208-073

SENSING ELEMENT: TD-3-LS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-01-10	0-01-10



GLAND STEAM SYSTEM TROUBLE

EVENT POINT 0252

INDICATED CONDITION:

- GLAND STEAM EXHAUST PRESSURE >10" H_2O AS SENSED BY GS-1-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

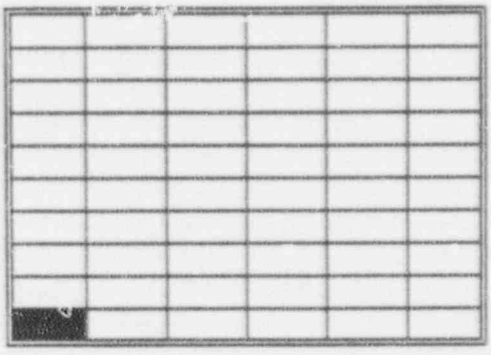
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF HIGH PRESSURE.
- ENSURE ONE GLAND EXHAUST FAN IN OPERATION.
- ENSURE THE FOLLOWING:
  CONDENSATE FLOW TO GLAND STEAM EXHAUST CONDENSER
  FAN IS NOT FULL OF WATER
  GLAND STEAM SUPPLY IS NOT EXCESSIVE

DISCUSSION:

REFERENCES: DRAWING 208-033 GS-01

SENSING ELEMENT: GS-1-PS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-01-10	0-01-10



GLAND STEAM SYSTEM TROUBLE

EVENT POINT 0253

INDICATED CONDITION:

- GSF-1A TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

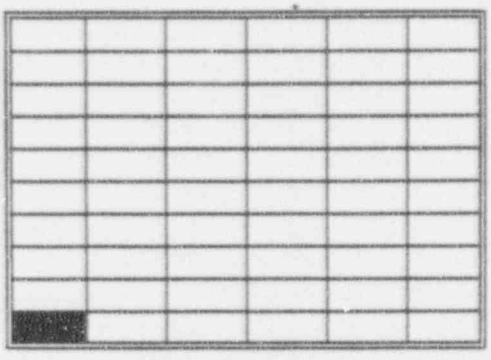
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF FAN TRIP.
- PLACE ALTERNATE GLAND EXHAUST FAN IN OPERATION.

DISCUSSION:

REFERENCES: DRAWING 208-033 GS-01

SENSING ELEMENT: CS/SC, CS/O CONTROL STATION CONTACTS, 4c/B BREAKER CONTACT

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-01-10	0-01-10



GLAND STEAM SYSTEM TROUBLE

EVENT POINT 0254

INDICATED CONDITION:

- GSF-1B TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

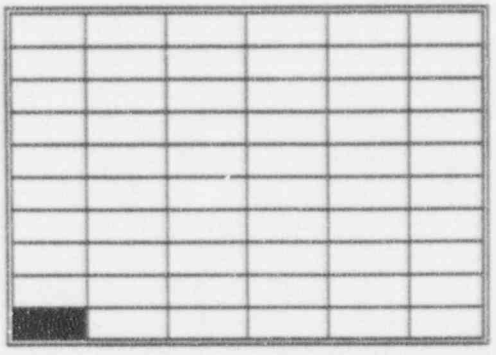
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF FAN TRIP.
- PLACE ALTERNATE GLAND EXHAUST FAN IN OPERATION.

DISCUSSION:

REFERENCES: DRAWING 208-033 GS-02

SENSING ELEMENT: CS/SC, CS/O CONTROL STATION CONTACTS, 42/B BREAKER CONTACT

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-01-10	0-01-10



GLAND STEAM SYSTEM TROUBLE

EVENT POINT 0255

INDICATED CONDITION:
- GLAND STEAM PRESSURE IS ONE OF THE FOLLOWING:

  HP TURBINE SUPPLY **>6.1 PSIG** AS SENSED BY GS-6-PS.
  OR
  ANY LP TURBINE **<.5 PSIG** AS SENSED BY GS-28, 29, 30, 32, OR 34-PS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- COMPUTER POINTS T001 THROUGH T005 MONITOR GLAND STEAM PRESSURES FOR THE LOW PRESSURE AND HIGH PRESSURE TURBINE GLANDS.

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE GLAND STEAM PRESSURES.

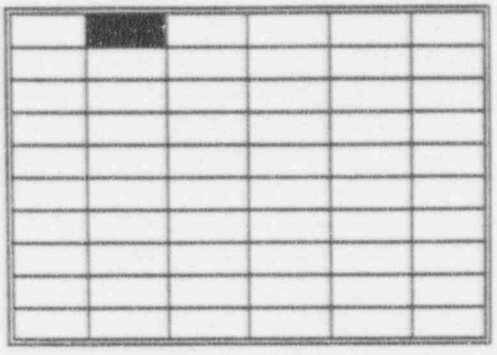
DISCUSSION:

GS-28-PS MONITORS THE GENERATOR END OF LP TURBINE 3A.
GS-29-PS MONITORS THE GOVERNOR END OF LP TURBINE 3A.
GS-32-PS MONITORS THE GENERATOR END OF LP TURBINE 3B.
GS-34-PS MONITORS THE GOVERNOR END OF LP TURBINE 3B.

REFERENCES: DRAWING 208-033 GS-07

SENSING ELEMENT: GS-6-PS, GS-28-PS, GS-29-PS, GS-32-PS, GS-34-PS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-02-01	O-02-01



**TURB GEN
LIFT OIL PUMP
TRIP**

EVENT POINT 1621

INDICATED CONDITION:

- TBP-6 BREAKER OPEN WITH CONTROL HANDLE IN NORMAL AFTER START.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- IF TURBINE RPM IS <600 RESTART TBP-6.
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE LUBE OIL SYSTEM.

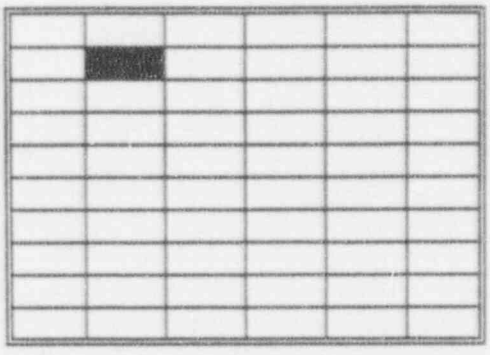
DISCUSSION:

BEARING OIL PRESSURE <3 PSIG AS SENSED BY TB-256-PS ALSO TRIPS TBP-6

REFERENCES: DRAWING 208-057 TB-05

SENSING ELEMENT: CS/SC, CS/O,(CONTROL STATION CONTACTS) 42B BREAKER CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-02-02	O-02-02



**TURB GEN
LIFT OIL PRESS
LOW**

EVENT POINT 1620

INDICATED CONDITION:

- TURBINE GENERATOR BEARING LIFT OIL PRESSURE **<850 PSIG** AS SENSED BY TB-331-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- ENSURE TBM-1 IS SHUTDOWN.
- DO NOT ROLL TURBINE UNTIL ALARM CONDITION IS CLEAR.
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE LUBE OIL SYSTEM.

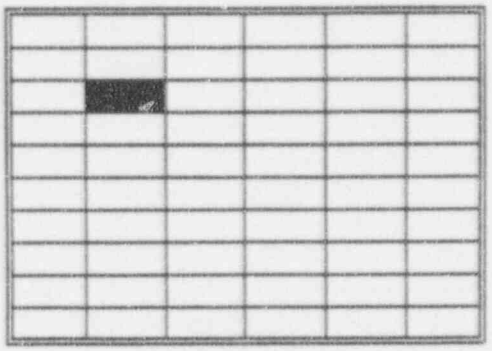
DISCUSSION:

THIS CONDITION SHOULD BE CORRECTED EXPEDITIOUSLY SO AS NOT TO CAUSE THE TURBINE TO BE IDLE FOR AN EXTENDED PERIOD WITH GLAND STEAM APPLIED TO THE SHAFT WHERE A SHAFT BOW COULD DEVELOP.

REFERENCES: DRAWING 208-057 TB-05

SENSING ELEMENT: TB-331-PS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-02-03	0-02-03



TURB GEN OIL PRESS PRETRIP

EVENT POINT 1631

INDICATED CONDITION:

- TURBINE GENERATOR BEARING OIL PRESSURE **<6 PSIG** AS SENSED BY TB-267-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIP

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-660.
- CHECK MAIN LUBE OIL PRESSURE.
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE LUBE OIL SYSTEM.

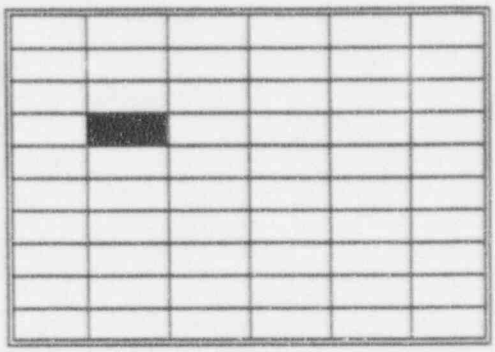
DISCUSSION:

TURBINE TRIP ON LOW MAIN TURBINE BEARING OIL PRESSURE IS >5 PSIG AND <7 PSIG

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-267-PS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-02-04	O-02-04



**TURB GEN
EMERG BRG PP
OVERLOAD**

EVENT POINT 1619

INDICATED CONDITION:

- TBP-3 MOTOR OVERLOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- WHITE INDICATING LIGHT IS OUT (LUBE OIL PRESSURE <25 PSIG)

OPERATOR ACTIONS FOR A VALID ALARM:

- IF TURBINE ROLLING THEN START TBP-2.
- CHECK MAIN LUBE OIL PRESSURE.
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE THERMAL OVERLOAD ON BREAKER

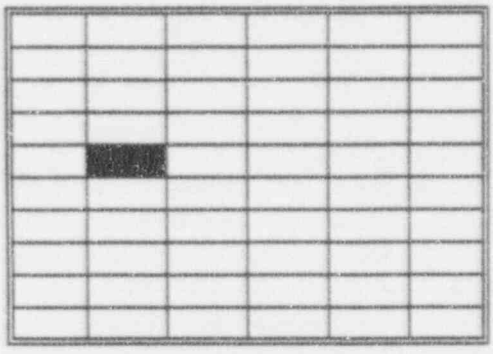
DISCUSSION:

THIS ALARM TELLS YOU THE THERMAL OVERLOAD HAS TRIPPED. YOU MAY STILL HAVE THE RED INDICATING LIGHT ON THE CONTROL STATION. IF THE PUMP IS NOT IN OPERATION THEN THE WHITE INDICATING LIGHT ON THE CONTROL STATION SHOULD BE OFF INDICATING PUMP DISCHARGE PRESSURE IS LOW (<25 PSIG).

REFERENCES: DRAWING 208-057 TB-12

SENSING ELEMENT: 49(OL)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-02-05	0-02-05



TG LUBE OIL RESVR LEVEL HIGH/LOW

EVENT POINT 1636

INDICATED CONDITION:

- TURBINE LUBE OIL TANK LEVEL >6.9' AS SENSED BY TB-248-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

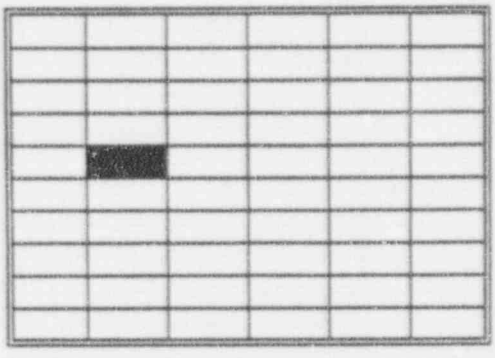
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE HIGH OIL LEVEL.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-248-LS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-02-05	0-02-05



TG LUBE OIL RESVR LEVEL HIGH/LOW

EVENT POINT 1637

INDICATED CONDITION:

- TURBINE LUBE OIL TANK LEVEL **<5.9'** AS SENSED BY TB-248-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

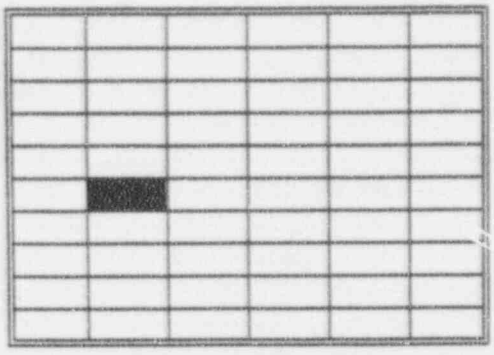
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE LOW OIL LEVEL.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-248-LS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-02-06	O-02-06



**TURB GEN
BRG OIL PUMP
OUT OF SERVICE**

EVENT POINT 1678

INDICATED CONDITION:

- TBP-2 IN PULL TO LOCK POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

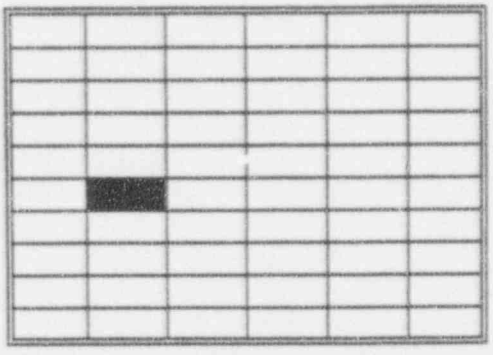
DISCUSSION:

THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS.

REFERENCES: DRAWING 208-057 TB-03

SENSING ELEMENT: CS/PTL CONTROL STATION CONTACT

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-02-06	0-02-06



**TURB GEN
BRG OIL PUMP
OUT OF SERVICE**

EVENT POINT 1679

INDICATED CONDITION:

o TBP-3 IN PULL TO LOCK POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

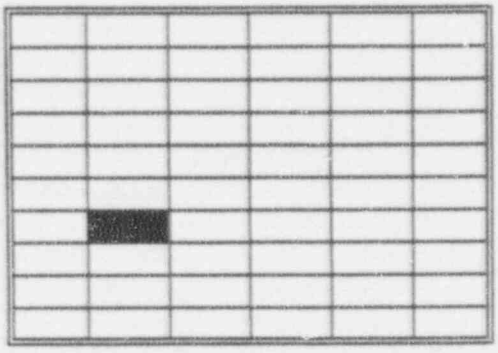
DISCUSSION:

THIS IS AN EXPECTED ALARM FOR BREAKER TAGGING OPERATIONS.

REFERENCES: DRAWING 208-057 TB-12

SENSING ELEMENT: CS/PTL CONTROL STATION CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-02-07	O-02-07



TG LUBE OIL VAPOR EXTRCT TROUBLE

EVENT POINT 1622

INDICATED CONDITION:

- TURBINE GENERATOR LUBE OIL RESERVOIR PRESSURE <1.3" H_2O **VACUUM** AS SENSED BY TB-285-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE TURBINE OIL RESERVOIR VAPOR EXTRACTOR FAN (LOF-4) FOR PROPER OPERATION.

DISCUSSION:

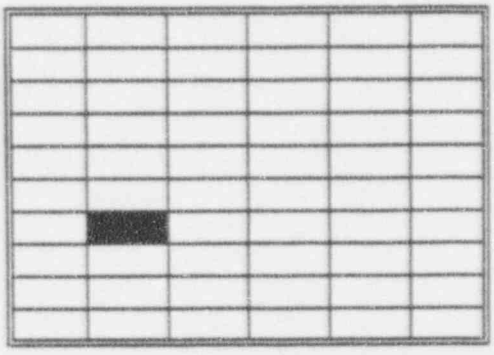
A MISADJUSTED FAN DAMPER AND/OR EXCESSIVE AIR INLEAKAGE COULD CAUSE THIS ALARM.

THE RESERVOIR VAPOR EXTRACTOR FAN KEEPS A SMALL NEGATIVE PRESSURE ON THE TURBINE GENERATOR LUBE OIL RESERVOIR. THE FAN HAS A DISCHARGE DAMPER USED TO ADJUST FLOW TO MAINTAIN THIS SMALL VACUUM.

REFERENCES: DRAWING 208-057 TB-08

SENSING ELEMENT: TB-285-PS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-02-07	0-02-07



TG LUBE OIL VAPOR EXTRCT TROUBLE

EVENT POINT 1643

INDICATED CONDITION:

- TURBINE GENERATOR SEAL OIL LOOP SEAL OIL TANK PRESSURE <0.5" H_2O VACUUM AS SENSED BY TB-304-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- COMPUTER POINT G001 AS SENSED BY 3TB-304-PS.

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE GENERATOR BEARING OIL DRAIN TANK VAPOR EXTRACTOR FAN (TBP-9) FOR PROPER OPERATION.

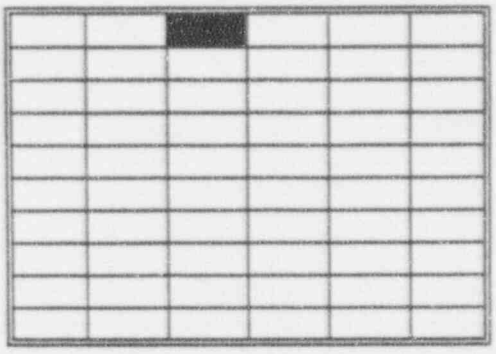
DISCUSSION:

THE SEAL OIL VAPOR EXTRACTOR FAN KEEPS A SMALL NEGATIVE PRESSURE ON THE TURBINE GENERATOR SEAL OIL LOOP SEAL. THE FAN HAS A DISCHARGE DAMPER USED TO ADJUST FLOW TO MAINTAIN THIS SMALL VACUUM.

REFERENCES: DRAWING 208-057 TB-08

SENSING ELEMENT: TB-203-PS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-03-01	0-03-01



MAIN TURB TRIP

EVENT POINT 1624

INDICATED CONDITION:

- TURBINE AUTO STOP OIL PRESSURE **<45 PSIG** AS SENSED BY TB-324-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC CONTROL PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

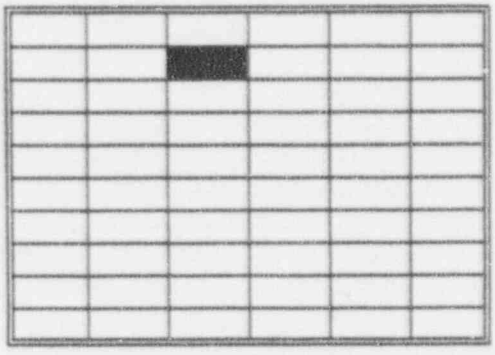
- REFER TO AP-660 OR AP-580.

DISCUSSION:
MAIN TURBINE TRIPS ARE AS FOLLOWS:
- -LOW CONDENSER VACUUM **>7" HgA AND <10" HgA** (>20" HgV AND <23"HgV)
- -LOW BEARING OIL PRESSURE **<7PSIG AND >5 PSIG**
- -TURBINE OVERSPEED **>1960 RPM**
- -EXCESSIVE AXIAL THRUST
- -REACTOR TRIP
- -MANUAL (LOCAL OR REMOTE)
- -ELECTRICAL FAULTS (SEVERAL AND VARIOUS)

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-324-PS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-02	0-03-02



TURB VACUUM PRETRIP

EVENT POINT 1630

INDICATED CONDITION:

- MAIN CONDENSER VACUUM **<25" HgV** AS SENSED BY TB-265-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- CONDENSER VACUUM INDICATION CD-7-PIR.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO OP-607.
- REFER TO OP-204 OR OP-203.
- ENSURE BACKUP AIR REMOVAL PUMP IS OPERATING.
- UNIT LOADS < 30% CONDENSER VACUUM MUST BE > 26.5" HgV (3.5 " HgA) **AND** UNIT LOADS >30% CONDENSER VACUUM MUST BE > 24.5" HgV (5.5" HgA). IF VACUUM CANNOT BE MAINTAINED WITHIN THESE LIMITS, **THEN** IMMEDIATELY REDUCE REACTOR POWER BELOW THE ANTICIPATORY TRIP SETPOINT AND TRIP THE MAIN TURBINE.

DISCUSSION:

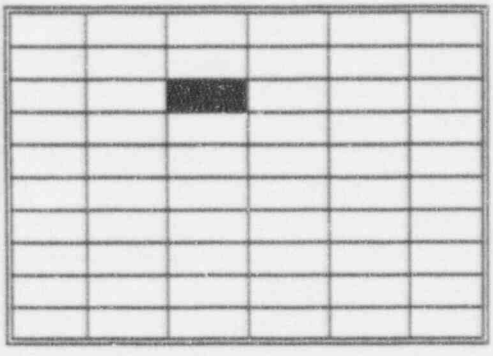
THIS ALARM IS A TRUE PRETRIP ALARM. THE SETPOINT FOR A TURBINE TRIP IS FROM >7" HgA TO <10" HgA, (>20" HgV TO <23" HgV).

SUBSTANTIAL TURBINE DAMAGE WILL OCCUR IF OPERATION CONTINUES FOR MORE THAN 5 MINUTES WHILE VACUUM IS BELOW THE ABOVE STATED LIMITS.

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-265-PS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-03	O-03-03



TURB THRUST BRG PRETRIP

EVENT POINT 1629

INDICATED CONDITION:

- THRUST BEARING OIL PRESSURE **>35 PSIG** AS SENSED BY TB-266-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE LOAD.
- REFER TO AP-660.

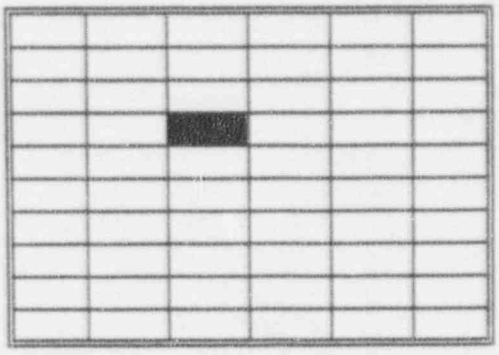
DISCUSSION:

THIS ALARM IS A TRUE PRETRIP ALARM. THE SETPOINT FOR A TURBINE TRIP IS >65 PSIG TO <80 PSIG.

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-266-PS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-04	O-03-04



TURB THROTTLE PRESSURE HIGH/LOW

EVENT POINT 0947

INDICATED CONDITION:

- TURBINE THROTTLE PRESSURE **>939 PSIG** AS SENSED BY SP-10-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THROTTLE PRESSURE INDICATION SP-010A-PIR1.

OPERATOR ACTIONS FOR A VALID ALARM:

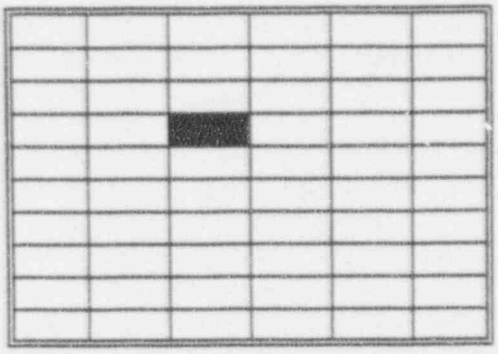
- ENSURE CORRECT MAIN STEAM HEADER PRESSURE SETPOINT IS SET ON IC-10-MS.
- INVESTIGATE CAUSE OF HIGH THROTTLE PRESSURE.
- IF TURBINE IS NOT CONTROLLING, TAKE MANUAL CONTROL OF TURBINE.

DISCUSSION:

REFERENCES: DRAWING 208-057 MS-14

SENSING ELEMENT: SP-10A-PY2-1,PYI-3, SP-10B-PY2-1,PY1-1 (NNI CONTACTS)

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-03-04	0-03-04



TURB THROTTLE PRESSURE HIGH/LOW

EVENT POINT 0948

INDICATED CONDITION:

- TURBINE THROTTLE PRESSURE **<835 PSIG** AS SENSED BY SP-10-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THROTTLE PRESSURE INDICATION SP-010A-PIR1.

OPERATOR ACTIONS FOR A VALID ALARM:

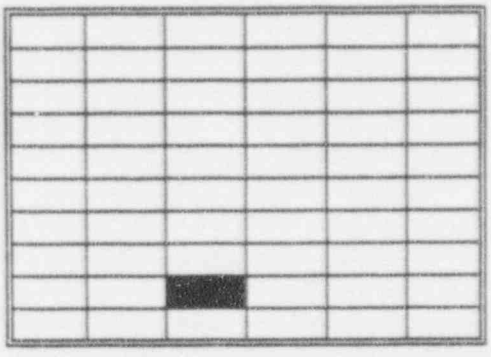
- ENSURE CORRECT MAIN STEAM HEADER PRESSURE SETPOINT IS SET ON IC-10-MS.
- INVESTIGATE CAUSE OF LOW THROTTLE PRESSURE.
- IF TURBINE IS NOT CONTROLLING, TAKE MANUAL CONTROL OF TURBINE.

DISCUSSION:

REFERENCES: DRAWING 208-057 MS-14

SENSING ELEMENT: SP-10A-PY2-1,PYI-3, SP-10B-PY2-1,PY1-1 (NNI CONTACTS)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0713

INDICATED CONDITION:

- GENERATOR NEUTRAL GROUND LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION, REAR OF MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

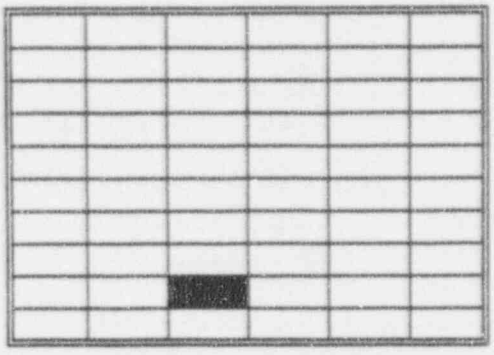
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4B FUSE #14. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-71

SENSING ELEMENT: 27C/86GG

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0714

INDICATED CONDITION:

- STEP-UP TRANSFORMER/GENERATOR DIFFERENTIAL LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON SSR SECTION, REAR OF MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

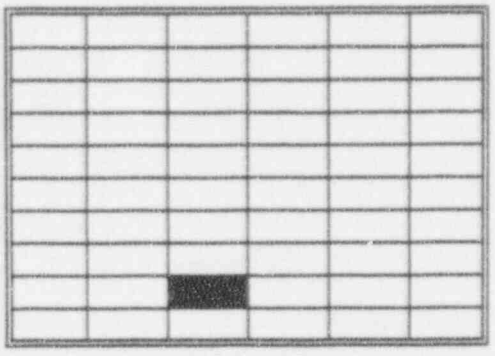
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4A FUSE #8. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-72

SENSING ELEMENT: 27C/186T

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0715

INDICATED CONDITION:

- GENERATOR DIFFERENTIAL LOCKOUT RELAYS LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON TGR SECTION, REAR OF MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

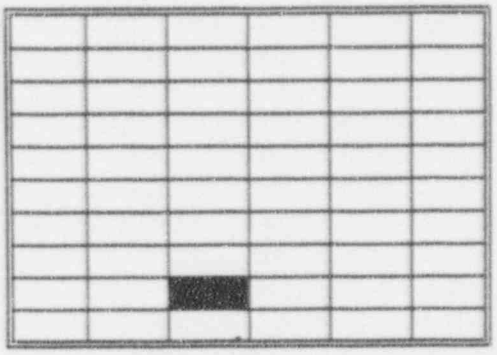
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4A FUSE #8. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-73

SENSING ELEMENT: 27C/86G

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0716

INDICATED CONDITION:

- GENERATOR BACKUP AND NEGATIVE SEQUENCE LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON TGR - REAR OF MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

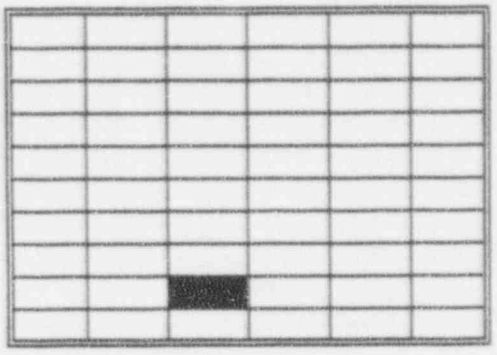
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4B FUSE #14. ALSO 2 SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-74

SENSING ELEMENT: 27C/86BUB2

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0717

INDICATED CONDITION:

- GENERATOR FIELD FAILURE LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION - REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

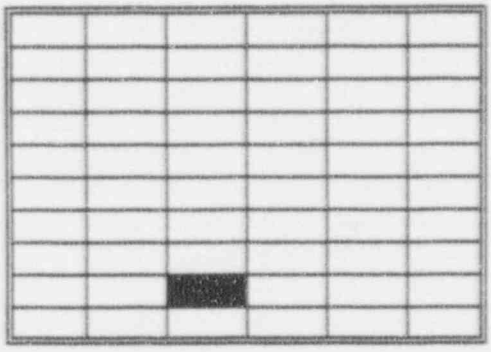
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4A FUSE #8. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-75

SENSING ELEMENT: 27C/86FF

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0718

INDICATED CONDITION:

- 480V ES BUS 3A UNDERVOLTAGE LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

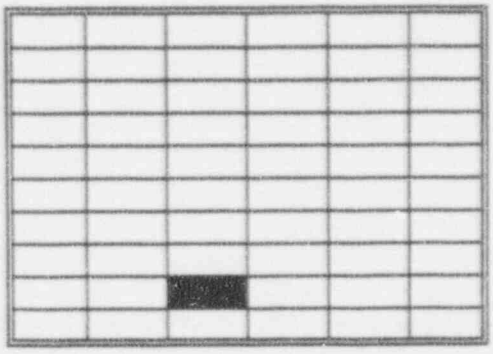
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #6. TWO SMALL FUSES ARE LOCATED INSIDE THE CONTROL BOARD FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-77

SENSING ELEMENT: 27C/ESA

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0721

INDICATED CONDITION:

- EXCITER OVERCURRENT AND GENERATOR VOLTAGE/FREQUENCY LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

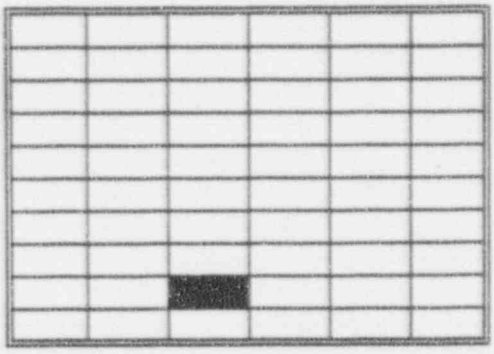
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4A FUSE #8. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-78

SENSING ELEMENT: 27C/86EXC

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0723

INDICATED CONDITION:

- 480V ES BUS 3B UNDERVOLTAGE LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

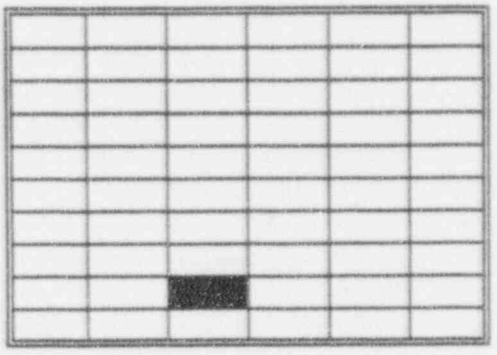
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #6. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-79

SENSING ELEMENT: 27C/ESB

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0724

INDICATED CONDITION:

- STEP-UP TRANSFORMER SUDDEN PRESSURE LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

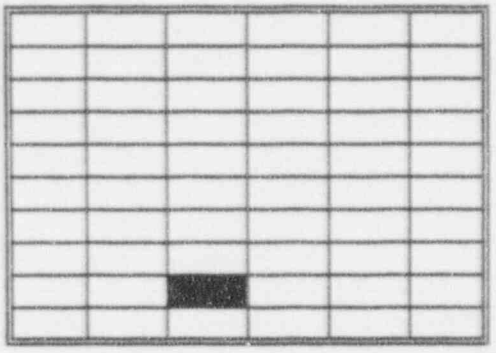
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4B FUSE #14. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-80

SENSING ELEMENT: 27C/86SPSU

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY
DC POWER
LOSS

EVENT POINT 0725

INDICATED CONDITION:

- UNIT AUX TRANSFORMER LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- FOR THE UNIT AUX TRANSFORMER ONE OR MORE OF THE FOLLOWING:
  PHASE DIFFERENTIAL NEUTRAL GROUND SUDDEN PRESSURE
  LOCKOUT RELAY AMBER INDICATING LIGHTS ARE OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

DISCUSSION:

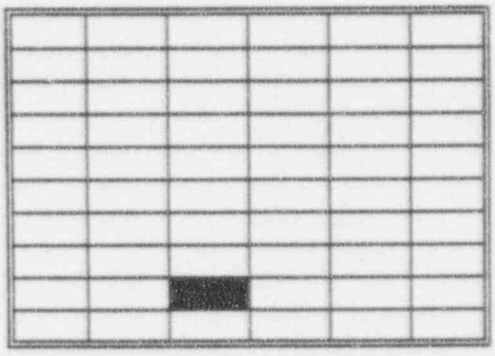
DC CONTROL POWER IS SUPPLIED FROM THE FOLLOWING: NEUTRAL GND DPDP-4A FUSE #11 / PHASE DIFFERENTIAL DPDP-4B FUSE #15 / SUDDEN PRESSURE DPDP-4A FUSE #11.

TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR EACH CIRCUIT.

REFERENCES: DRAWING 208-040, MT-81, 82, 83

SENSING ELEMENT. 86/86TNUA/86TUA/86SPSUA

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0729

INDICATED CONDITION:

- START-UP TRANSFORMER LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- FOR THE UNIT AUX TRANSFORMER ONE OR MORE OF THE FOLLOWING: PHASE DIFFERENTIAL NEUTRAL GROUND SUDDEN PRESSURE LOCKOUT RELAY AMBER INDICATING LIGHTS ARE OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

DISCUSSION:

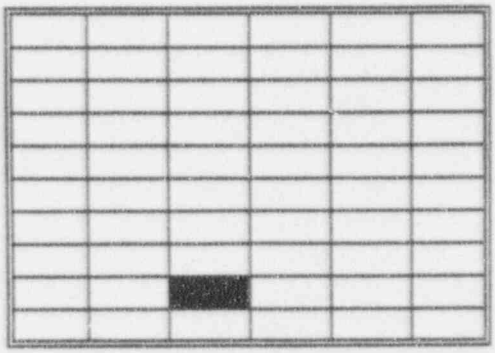
DC CONTROL POWER IS SUPPLIED FROM: FOR SUDDEN PRESSURE AND NEUTRAL GROUND THEY ARE DPDP-4A FUSE #11 / PHASE DIFFERENTIAL IS DPDP-4B FUSE #15.

TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-84, 85, 86

SENSING ELEMENT: 27C/86SPSTU, 86TNSTU, 86TSTU

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 0850

INDICATED CONDITION:

- CUTOUT SWITCHES ARE OPEN, (LOSS OF DC POWER) FOR ONE OR MORE OF THE FOLLOWING:

  UNIT TRIP PRIMARY OR ALTERNATE LOCKOUT RELAY (86UTPX,PY; 86UTAX,AY)

  BEST TRANSFORMER LOCKOUT RELAY

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY INDICATING LIGHT IS OFF, LOCATED ON THE GENERATOR FEED AUX ASMBLY OR SS SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

DISCUSSION:

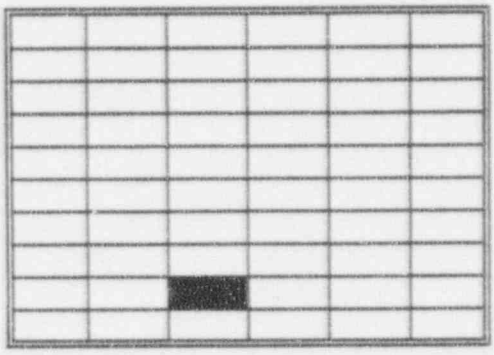
DC CONTROL POWER IS SUPPLIED FROM DPDP-7A FUSE #7 FOR UNIT TRIP PRIMARY AND ALTERNATE TRIP RELAYS. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

OPENING THESE CUTOUT SWITCHES DISABLES THE SUBSTATION TRIPS FROM OPENING PLANT BREAKERS AUTOMATICALLY.

REFERENCES: DRAWING 208-079 SB-03, SB-04

SENSING ELEMENT: LOA6, LOA5, 1SX2, LOA2, LOA3 RELAYS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 1175

INDICATED CONDITION:

- REACTOR TRIPPED LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

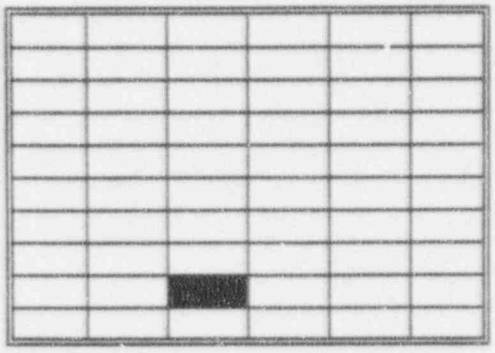
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4B FUSE #15. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-98

SENSING ELEMENT: 27C/REA

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 1180

INDICATED CONDITION:

- GENERATOR UNDERFREQUENCY LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

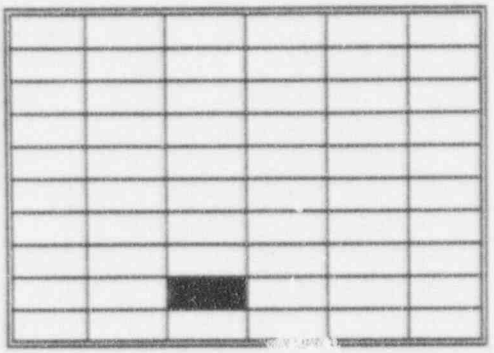
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4B FUSE #14. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-102

SENSING ELEMENT: 27C/81G

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-03-09	0-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 1639

INDICATED CONDITION:

- EH LOW FLUID LEVEL LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

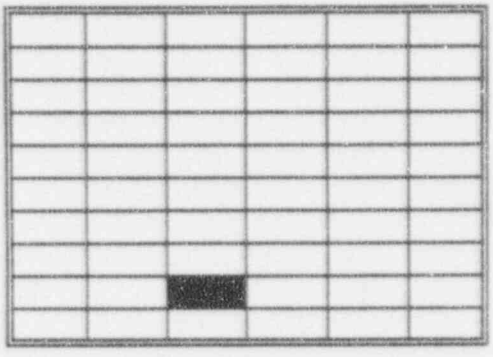
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-3A FUSE #20. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-057 TB-16

SENSING ELEMENT: 27C/86LFT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-03-09	O-03-09



LOCKOUT RELAY DC POWER LOSS

EVENT POINT 1674

INDICATED CONDITION:

- TURBINE TRIP LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC POWER.

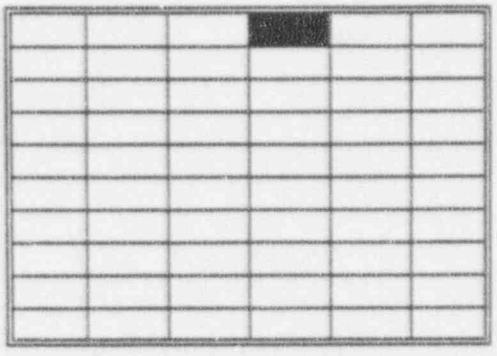
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-4B FUSE #20. TWO SMALL FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-057 TB-22

SENSING ELEMENT: 27C/86TURB

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-04-01	0-04-01



TURB EXH STM TEMP HIGH

EVENT POINT 1632

INDICATED CONDITION:

- LP TURBINE #1 EXHAUST TEMPERATURE >175°F AS SENSED BY TB-279-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- START HOOD SPRAYS.

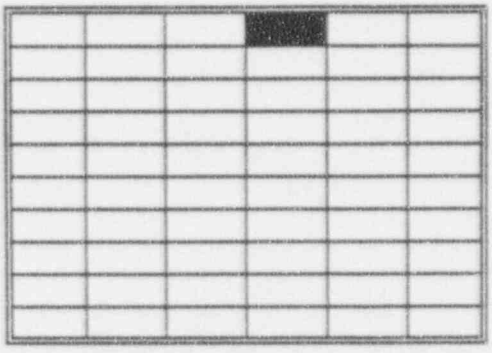
DISCUSSION:

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-279-TS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-01	O-04-01



TURB EXH STM TEMP HIGH

EVENT POINT 1633

INDICATED CONDITION:

- LP TURBINE #2 EXHAUST TEMPERATURE >175°F AS SENSED BY TB-280-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- START HOOD SPRAYS.

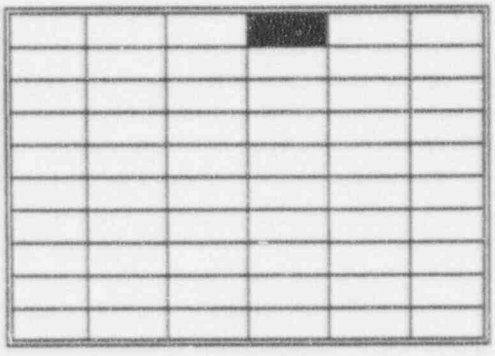
DISCUSSION:

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-280-TS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-04-01	0-04-01



TURB EXH STM TEMP HIGH

EVENT POINT 1634

INDICATED CONDITION:

- LP TURBINE #1 EXHAUST TEMPERATURE **>250°F** AS SENSED BY TB-279-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INCREASE CONDENSER VACUUM, REFER TO OP-607
- INCREASE TURBINE LOAD.
- IF TURBINE LOAD CANNOT BE INCREASED THEN CONSIDERATION SHOULD BE GIVEN TO TAKE THE TURBINE OFF LINE.

DISCUSSION:

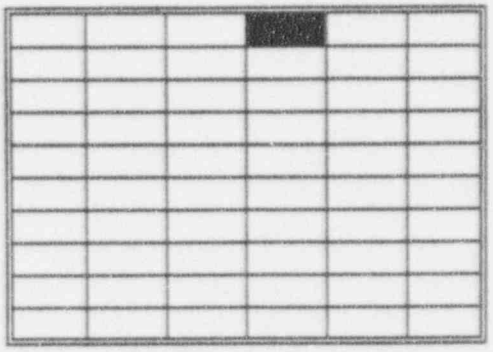
HIGH TURBINE EXHAUST TEMPERATURES WITH NORMAL CONDENSER VACUUM ARE CAUSED BY INSUFFICIENT ENERGY BEING REMOVED FROM THE STEAM BY THE LOW PRESSURE TURBINES. BY INCREASING TURBINE LOAD THESE TEMPERATURES WILL DECREASE.

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-279-TS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-04-01	0-04-01



TURB EXH STM TEMP HIGH

EVENT POINT 1635

INDICATED CONDITION:

- LP TURBINE #2 EXHAUST TEMPERATURE >250°F AS SENSED BY TB-280-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INCREASE CONDENSER VACUUM, REFER TO OP-607
- INCREASE TURBINE LOAD.
- IF TURBINE LOAD CANNOT BE INCREASED THEN CONSIDERATION SHOULD BE GIVEN TO TAKE THE TURBINE OFF LINE.

DISCUSSION:

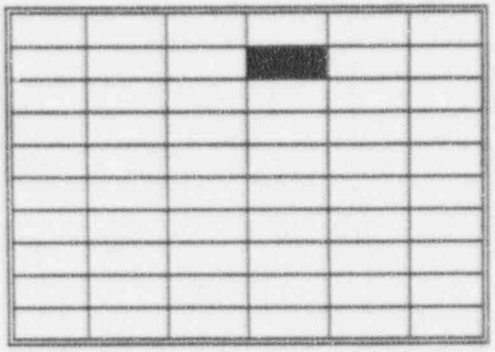
HIGH TURBINE EXHAUST TEMPERATURES WITH NORMAL CONDENSER VACUUM ARE CAUSED BY INSUFFICIENT ENERGY BEING REMOVED FROM THE STEAM BY THE LOW PRESSURE TURBINES. BY INCREASING TURBINE LOAD THESE TEMPERATURES WILL DECREASE.

MAXIMUM ΔT BETWEEN CONDENSERS USING LP TURBINE EXHAUST TEMPERATURE IS 50° F.

REFERENCES: DRAWING 208-057 TB-15

SENSING ELEMENT: TB-280-TS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-02	O-04-02



TURBINE STEAM FLOW LOW

EVENT POINT 1638

INDICATED CONDITION:

- ΔP BETWEEN HIGH PRESSURE TURBINE INLET AND OUTLET **<21 PSID** AS SENSED BY MS-87-PS, WITH EITHER 1661 AND/OR 1662 OUTPUT BREAKERS CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GENERATOR MEGAWATT INDICATION LOW WITH AT LEAST ONE OUTPUT BREAKER CLOSED

OPERATOR ACTIONS FOR A VALID ALARM:

- INCREASE TURBINE LOAD.
- IF TURBINE LOAD CANNOT BE INCREASED THEN CONSIDERATION SHOULD BE GIVEN TO TAKE THE TURBINE OFF LINE BY OPENING ANY CLOSED OUTPUT BREAKER(S).

DISCUSSION:

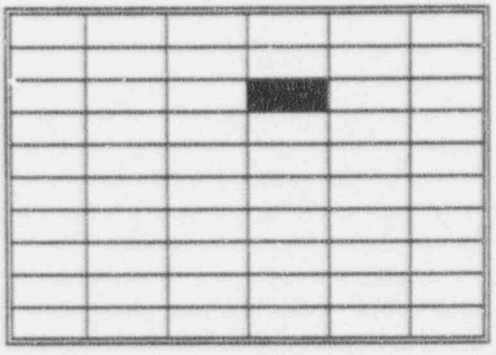
THIS EVENT POINT SIGNALS THE START OF A 60 SECOND TIME DELAY THAT IF THE CONDITION DOES NOT CLEAR IN THAT TIME THE TURBINE WILL BE TRIPPED.

WHEN THE FIRST OUTPUT BREAKER IS CLOSED A TIMER IS ACTIVATED WITH A 60 SECOND TIME DELAY. IF TURBINE LOAD IS NOT INCREASED DURING THIS TIME THEN A TRIP SIGNAL IS SENT TO THE TURBINE.

REFERENCES: DRAWING 208-057 TB-20

SENSING ELEMENT: MS-87-PS, 2MS-87-PS(TDE 60 SEC)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-03	O-04-03



TURBINE LIMITED BY VALVE POS

EVENT POINT 1660

INDICATED CONDITION:

- GOVERNOR VALVE POSITION IS EQUAL TO SELECTED VALVE POSITION LIMIT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- INDICATED VALVE POSITION LIMIT ON EHC PANEL.
- INDICATED VALVE POSITION ON EHC PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE LOAD.
- IF UNIT NOT AT FULL POWER INCREASE VALVE POSITION LIMIT.

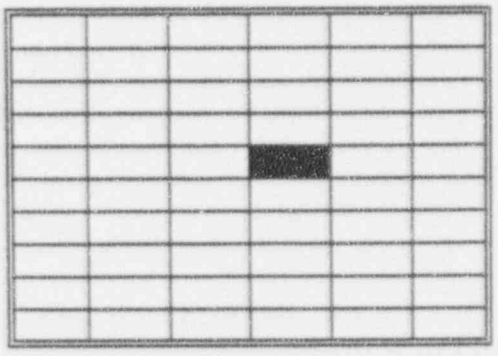
DISCUSSION:

IF TURBINE IS VALVE POSITION LIMITED WITH ICS IN FULL AUTO AND THE GENERATOR OUTPUT FALLS BELOW THE ULD SETTING, A SIGNIFICANT HEADER PRESSURE ERROR WILL DEVELOP AND POSSIBLY RESULT IN ICS SHIFT TO TRACK AT 50 PSIG HEADER PRESSURE ERROR WITH THE TURBINE SHIFTING TO MANUAL.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: EHC CONTACT IN VALVE POSITION LIMITING CIRCUIT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-05	O-04-05



TURB GEN ROTOR VIB HIGH

EVENT POINT 1670

INDICATED CONDITION:

- TURBINE ROTOR VIBRATION >7 **MILS** ON ANY 1 OF 9 TURBINE BEARINGS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BEARING VIBRATION INDICATORS FOR EACH TURBINE BEARING ON TGF PANEL.
- BEARING VIBRATION RECORDER FOR EACH TURBINE BEARING TB-194-SIR1 ON TGR PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE LOAD.
- IF AT CRITICAL SPEED ACCELERATE TURBINE TO LEAVE CRITICAL SPEED AREA.
- IF VIBRATION EXCEEDS 14 MILS THEN CONSIDERATION SHOULD BE GIVEN TO TRIP THE TURBINE OR OTHER SUITABLE ACTION BASED ON PLANT CONDITIONS.

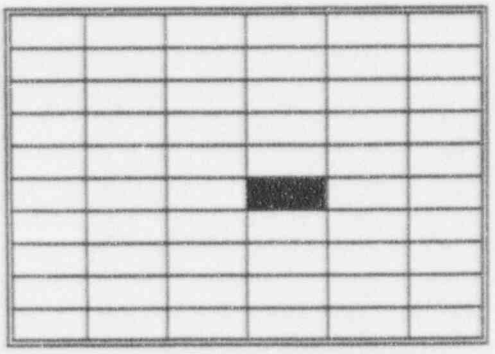
DISCUSSION:

VIBRATION INSTRUMENTS ARE USED TO MEASURE TURBINE ROTOR VIBRATION ABOVE 600 RPM. BELOW 600 RPM ROTOR ANOMALIES ARE MEASURED BY THE ECCENTRICITY INSTRUMENT.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/VB CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 4)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-06	O-04-06



**TURB GEN
ROTOR ECC
HIGH**

EVENT POINT 1669

INDICATED CONDITION:

- TURBINE ROTOR ECCENTRICITY >3 MILS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- INDICATED ECCENTRICITY FOR TURBINE ROTOR (TB-346-KI) ON TGF PANEL.
- TURBINE SUPERVISORY MONITORING RECORDER TB-194-SIR1 ON TGR PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE LOAD.
- IF TURBINE IS OFF LINE WITH GLAND STEAM APPLIED, NOTIFY SECONDARY PLANT OPERATOR TO PLACE ON TURNING GEAR.

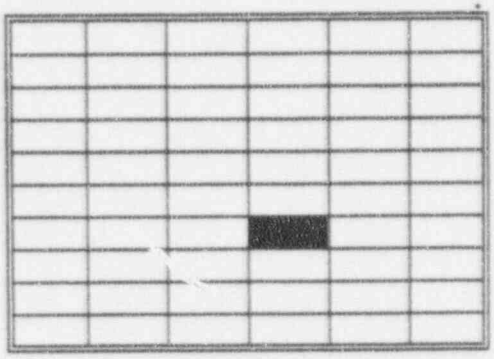
DISCUSSION:

ROTOR ECCENTRICITY IS A MEASURE OF HOW MUCH THE TURBINE SHAFT IS BOWED. IT IS CAUSED BY UNEVEN HEATING OF THE TURBINE SHAFT AND USUALLY ONLY OCCURS DURING TURBINE STARTUP OR SHUTDOWN AND WHEN THE TURBINE IS NOT ROTATING. THE BOWING OF THE ROTOR IS RECORDED CONTINUOUSLY FROM TURNING GEAR SPEED TO APPROXIMATELY 600 RPM. ABOVE 600 RPM THE VIBRATION INSTRUMENTS ARE USED TO INDICATE ROTOR ANOMALIES.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/RX CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 3)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-07	O-04-07



TURB EXPANSION TROUBLE

EVENT POINT 1665

INDICATED CONDITION:

- TURBINE DIFFERENTIAL EXPANSION **<158 MILS**, ROTOR #1 LONG.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIFFERENTIAL EXPANSION (TB-347-KI) INDICATION ON TGF PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE HEATUP RATE.

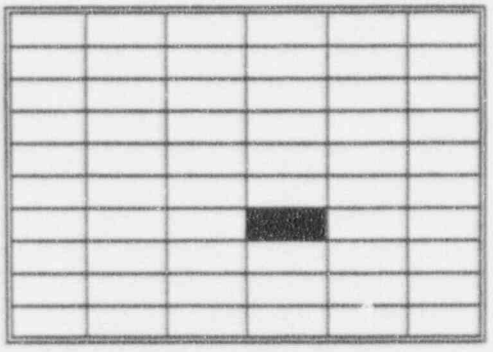
DISCUSSION:

DIFFERENTIAL EXPANSION REFERS TO THE RELATIVE LENGTHS OF THE TURBINE ROTOR COMPARED TO THE TURBINE CASING. EITHER A LONG OR SHORT CONDITION CAN CAUSE TURBINE DAMAGE IF CONTACT OCCURS. THE CONDITION IS CAUSED BY UNEVEN HEATUP OF TURBINE COMPONENTS AND CAN BE CORRECTED BY SLOWING THE HEATUP RATE.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/DE CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 1 & 2)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-07	O-04-07



TURB EXPANSION TROUBLE

EVENT POINT 1666

INDICATED CONDITION:

- TURBINE DIFFERENTIAL EXPANSION **>616 MILS**, ROTOR #1 SHORT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIFFERENTIAL EXPANSION (TB-347-KI) INDICATION ON TGF PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE HEATUP RATE.

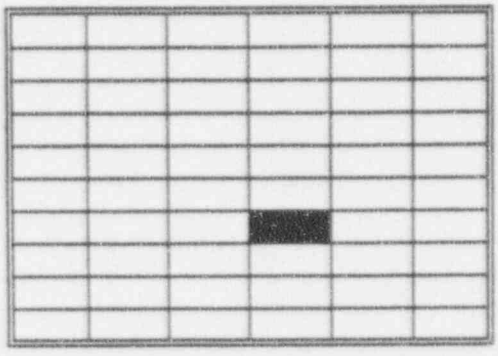
DISCUSSION:

DIFFERENTIAL EXPANSION REFERS TO THE RELATIVE LENGTHS OF THE TURBINE ROTOR COMPARED TO THE TURBINE CASING. EITHER A LONG OR SHORT CONDITION CAN CAUSE TURBINE DAMAGE IF CONTACT OCCURS. THE CONDITION IS CAUSED BY UNEVEN HEATUP OF TURBINE COMPONENTS AND CAN BE CORRECTED BY SLOWING THE HEATUP RATE.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/DE CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 1 & 2)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-07	O-04-07



TURB EXPANSION TROUBLE

EVENT POINT 1667

INDICATED CONDITION:

- TURBINE DIFFERENTIAL EXPANSION **<345 MILS**, ROTOR #2 LONG.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIFFERENTIAL EXPANSION (TB-348-KI) INDICATION ON TGF PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE HEATUP RATE.

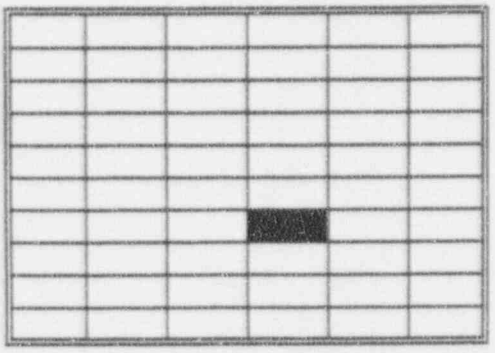
DISCUSSION:

DIFFERENTIAL EXPANSION REFERS TO THE RELATIVE LENGTHS OF THE TURBINE ROTOR COMPARED TO THE TURBINE CASING. EITHER A LONG OR SHORT CONDITION CAN CAUSE TURBINE DAMAGE IF CONTACT OCCURS. THE CONDITION IS CAUSED BY UNEVEN HEATUP OF TURBINE COMPONENTS AND CAN BE CORRECTED BY SLOWING THE HEATUP RATE.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/DE CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 1 & 2)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-07	O-04-07



TURB EXPANSION TROUBLE

EVENT POINT 1668

INDICATED CONDITION:

- TURBINE DIFFERENTIAL EXPANSION >1454 **MILS**, ROTOR #2 SHORT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIFFERENTIAL EXPANSION (TB-348-KI) INDICATION ON TGF PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE HEATUP RATE.

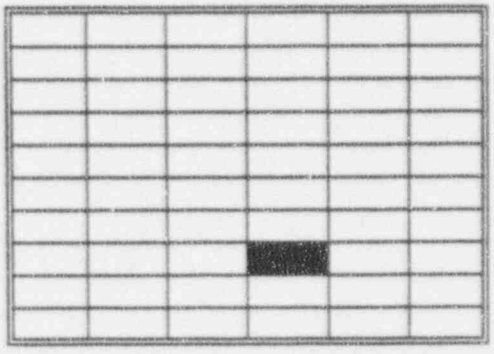
DISCUSSION:

DIFFERENTIAL EXPANSION REFERS TO THE RELATIVE LENGTHS OF THE TURBINE ROTOR COMPARED TO THE TURBINE CASING. EITHER A LONG OR SHORT CONDITION CAN CAUSE TURBINE DAMAGE IF CONTACT OCCURS. THE CONDITION IS CAUSED BY UNEVEN HEATUP OF TURBINE COMPONENTS AND CAN BE CORRECTED BY SLOWING THE HEATUP RATE.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/DE CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 1 & 2)

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-08	O-04-08



TURB ROTOR POSITION TROUBLE

EVENT POINT 1663

INDICATED CONDITION:

- GOVERNOR END ROTOR POSITION **<25 MILS.**

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- ROTOR POSITION RECORDER (TB-119-ZIR) INDICATION ON TGF PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE GENERATOR LOAD AND INVESTIGATE CAUSE OF THRUST BEARING NOT CONTROLLING ROTOR POSITION.
- IF TURBINE IS TRIPPED BY THE THRUST BEARING TRIP DEVICE THEN INSPECT THRUST BEARING COMPONENTS.

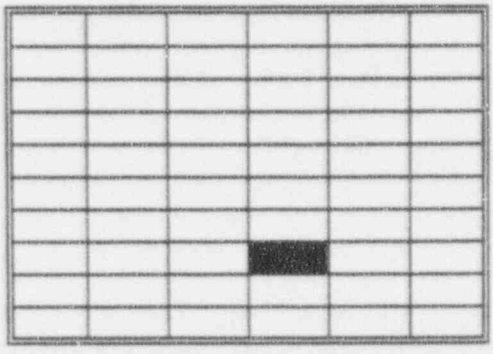
DISCUSSION:

THE ROTOR POSITION INSTRUMENT MEASURES THE RELATIVE POSITION OF THE ROTOR THRUST COLLAR TO THE THRUST BEARING SUPPORT. SMALL CHANGES IN ROTOR POSITION CAN OCCUR WITH CHANGING ELECTRICAL LOAD. ANY WEAR ON THE THRUST SHOES RESULTS IN A MOVEMENT OF THE ROTOR AND IS RECORDED ON TB-119-ZIR.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/RPCE CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 1 & 2)

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-04-08	0-04-08



**TURB
ROTOR POSITION
TROUBLE**

EVENT POINT 1664

INDICATED CONDITION:

- GOVERNOR END ROTOR POSITION >95 MILS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- ROTOR POSITION RECORDER (TB-119-ZIR) INDICATION ON TGF PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE TURBINE GENERATOR LOAD AND INVESTIGATE CAUSE OF THRUST BEARING NOT CONTROLLING ROTOR POSITION.
- IF TURBINE IS TRIPPED BY THE THRUST BEARING TRIP DEVICE THEN INSPECT THRUST BEARING COMPONENTS.

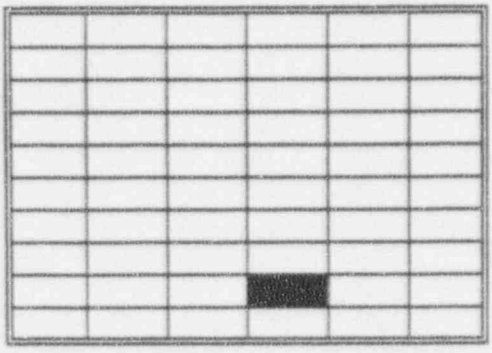
DISCUSSION:

THE ROTOR POSITION INSTRUMENT MEASURES THE RELATIVE POSITION OF THE ROTOR THRUST COLLAR TO THE THRUST BEARING SUPPORT. SMALL CHANGES IN ROTOR POSITION CAN OCCUR WITH CHANGING ELECTRICAL LOAD. ANY WEAR ON THE THRUST SHOES RESULTS IN A MOVEMENT OF THE ROTOR AND IS RECORDED ON TB-119-ZIR.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: PD/RPCE CONTACT (SEE WESTINGHOUSE DWG 652B828 SHEET 1 & 2)

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-04-09	0-04-09



TURB GEN SPEED CHANNEL TROUBLE

EVENT POINT 1661

INDICATED CONDITION:

- SPEED CHANNEL FAILURE.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- SPEED CHANNEL MONITOR IS BACKLIGHTED ON THE EHC CONTROL PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- STABILIZE THE PLANT IF THE TURBINE HAS SHIFTED OUT OF ICS CONTROL INTO MANUAL

DISCUSSION:

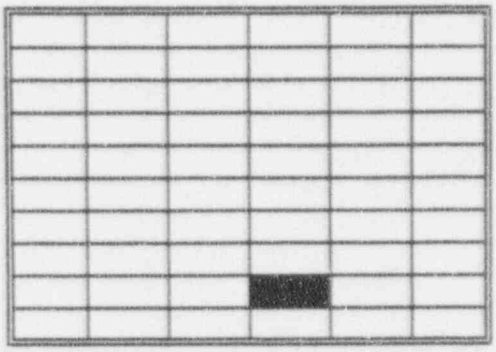
THE EHC CONTROLLER WILL REVERT TO THE MANUAL MODE IF THERE IS A FAILURE OF ANY ONE OF THE FOLLOWING CHANNELS: MAIN SPEED, AUX SPEED, SPEED REFERENCE, LOAD REFERENCE.

HEADER PRESSURE CONTROL WITH THE TURBINE IN MANUAL IS VIA OPERATOR ACTION USING GV OR TV OPEN OR CLOSE P/B's IN ADDITION THE TBV'S WILL CONTROL HEADER PRESSURE IF HEADER PRESSURE ERROR IS 50 PSIG, REACTOR BAILEY IS ALSO IN MANUAL, OR ICS DEMAND DECREASES TO 15%.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: EHC CONTACT

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-04-09	0-04-09



TURB GEN SPEED CHANNEL TROUBLE

EVENT POINT 1662

INDICATED CONDITION:

- SPEED REFERENCE CHANNEL FAILURE.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- SPEED REFERENCE MONITOR IS BACKLIGHTED ON THE EHC CONTROL PANEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- STABILIZE THE PLANT IF THE TURBINE HAS SHIFTED OUT OF ICS CONTROL INTO MANUAL

DISCUSSION:

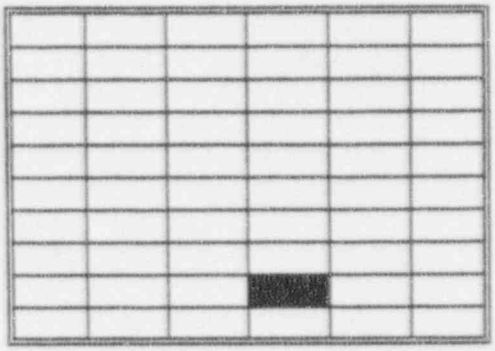
THE EHC CONTROLLER WILL REVERT TO THE MANUAL MODE IF THERE IS A FAILURE OF ANY ONE OF THE FOLLOWING CHANNELS: MAIN SPEED, AUX SPEED, SPEED REFERENCE, LOAD REFERENCE.

HEADER PRESSURE CONTROL WITH THE TURBINE IN MANUAL IS VIA OPERATOR ACTION USING GV OR TV OPEN OR CLOSE P/B's IN ADDITION THE TBV'S WILL CONTROL HEADER PRESSURE IF HEADER PRESSURE ERROR IS 50 PSIG, REACTOR BAILEY IS ALSO IN MANUAL, OR ICS DEMAND DECREASES TO 15%.

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: EHC CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-09	O-04-09



TURB GEN SPEED CHANNEL TROUBLE

EVENT POINT 1673

INDICATED CONDITION:

- OPC TRANSDUCER OR SPEED PROTECTION CONTROL CIRCUIT FAILURE.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- OPC FAILURE INDICATION ON EHC CONTROL PANEL.

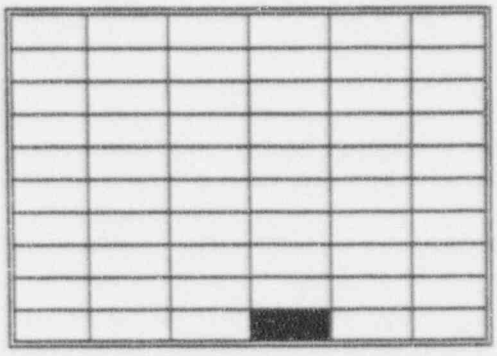
OPERATOR ACTIONS FOR A VALID ALARM:

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-27

SENSING ELEMENT: EHC CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-04-10	O-04-10



**TURB
AT ZERO SPEED**

EVENT POINT 1623

INDICATED CONDITION:

- TURBINE GENERATOR SHAFT HAS STOPPED ROLLING.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE SHAFT SPEED INDICATION ON EHC CONTROL PANEL.
- COMPUTER POINT T010.

OPERATOR ACTIONS FOR A VALID ALARM:

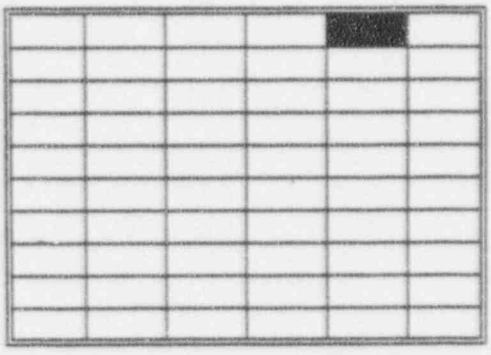
- ENSURE TURNING GEAR IS ENGAGED AND SHAFT IS TURNING.
- NOTIFY SECONDARY PLANT OPERATOR TO PLACE TURBINE ON TURNING GEAR MANUALLY IF AUTO FUNCTION DOES NOT OPERATE.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-06

SENSING ELEMENT: 14/ZSX RELAY

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-05-01	O-05-01



TURB AMSAC CHANNEL TRIP

EVENT POINT 2041

INDICATED CONDITION:

- REACTOR POWER >25% RTP AND FEEDWATER FLOW ON BOTH LOOPS <17% RATED FLOW ON AMSAC CHANNEL "A".

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- POWER RANGE NUCLEAR INSTRUMENTS ON MAIN CONTROL BOARD.
- FEEDWATER FLOW (MAIN AND START-UP) INDICATION ON MAIN CONTROL BOARD.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-660.
- REFER TO AP-450.

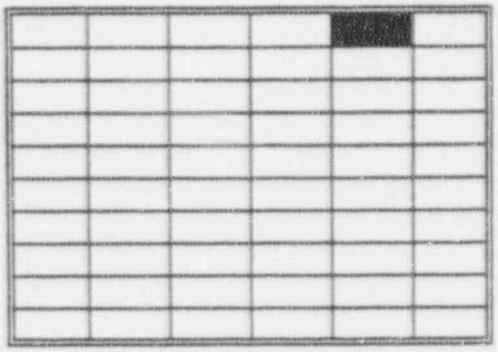
DISCUSSION:

AMSAC SENSES REACTOR POWER USING POST ACCIDENT NI'S, AND FEED FLOW USING MAIN AND STARTUP FEED FLOW INSTRUMENTATION.

REFERENCES: DRAWING 205-074

SENSING ELEMENT: ATCP-1, AT-7-FS, AT-8-FS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-05-01	O-05-01



TURB AMSAC CHANNEL TRIP

EVENT POINT 2042

INDICATED CONDITION:

- REACTOR POWER >25% RTP **AND** FEEDWATER FLOW ON BOTH LOOPS <17% RATED FLOW ON AMSAC CHANNEL "B".

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- POWER RANGE NUCLEAR INSTRUMENTS ON MAIN CONTROL BOARD.
- FEEDWATER FLOW (MAIN AND START-UP) INDICATION ON MAIN CONTROL BOARD.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-660.
- REFER TO AP-450.

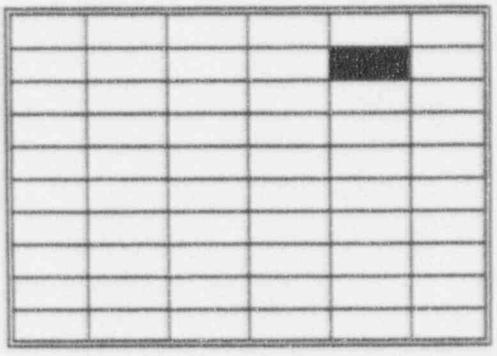
DISCUSSION:

AMSAC SENSES REACTOR POWER USING POST ACCIDENT NI'S, AND FEED FLOW USING MAIN **AND** STARTUP FEED FLOW INSTRUMENTATION.

REFERENCES: DRAWING 205-074

SENSING ELEMENT: ATCP-1, AT-7-FS, AT-8-FS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-05-02	0-05-02



TURB AMSAC LOW FLUX BYPASS

EVENT POINT 1504

INDICATED CONDITION:

- REACTOR POWER **<25% RTP**.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- POWER RANGE NUCLEAR INSTRUMENTS ON MAIN CONTROL BOARD.

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY LOCAL CABINET STATUS IF REACTOR POWER IS >25% RTP.

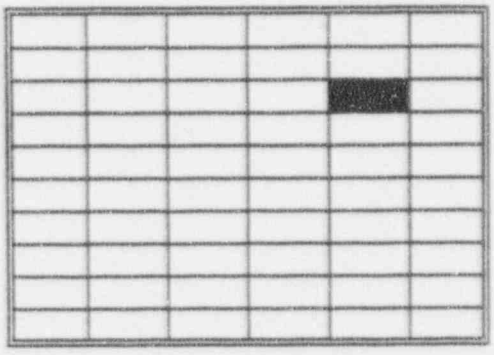
DISCUSSION:

WITH REACTOR POWER <25% RTP BY POST ACCIDENT NI'S, THEN THE AMSAC CHANNELS ARE BLOCKED FROM TRIPPING.

REFERENCES: DRAWING 205-074

SENSING ELEMENT: ATCP-1, NI-15-NS, NI-14-NS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-05-03	O-05-03



TURB AMSAC CHANNEL IN TEST

EVENT POINT 1239

INDICATED CONDITION:

- AMSAC CHANNEL "A" IN TEST.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY LOCAL CABINET STATUS IF TESTING IS NOT IN PROGRESS.

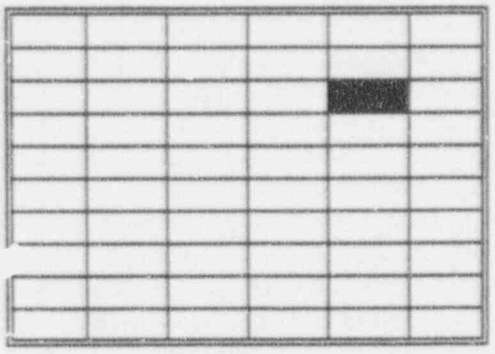
DISCUSSION:

THE OPPOSITE CHANNEL NOT IN TEST IS BLOCKED FROM TRIPPING.

REFERENCES: DRAWING 205-074

SENSING ELEMENT: ATCP-1

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-05-03	0-05-03



TURB AMSAC CHANNEL IN TEST

EVENT POINT 1243

INDICATED CONDITION:

- AMSAC CHANNEL "B" IN TEST.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY LOCAL CABINET STATUS IF TESTING IS NOT IN PROGRESS.

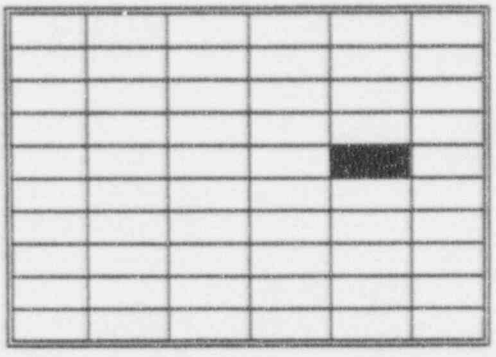
DISCJSSION:

THE OPPOSITE CHANNEL NOT IN TEST IS BLOCKED FROM TRIPPING.

REFERENCES: DRAWING 205-074

SENSING ELEMENT: ATCP-1

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-05-05	O-05-05



**TURB GEN
RADIO FREQ
HIGH**

EVENT POINT 2005

INDICATED CONDITION:

- MAIN GENERATOR RADIO FREQUENCIES ARE HIGH AS SENSED BY RF MONITORING.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RF MONITORING CABINET LOCAL INDICATION

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY TURBINE BUILDING OPERATOR TO INVESTIGATE RF MONITORING CABINET.
- NOTIFY SYSTEM ENGINEER TO COMPARE WITH OTHER KNOWN DATA.
- REFER TO OP-701.

DISCUSSION:

THIS ALARM SERVES AS AN EARLY WARNING OF A GENERATOR FAILURE SUCH AS INSULATION BREAKDOWN AND/OR GAS SPACE IMPURITIES THAT MAY HAVE ENTERED THE GAS SPACES.

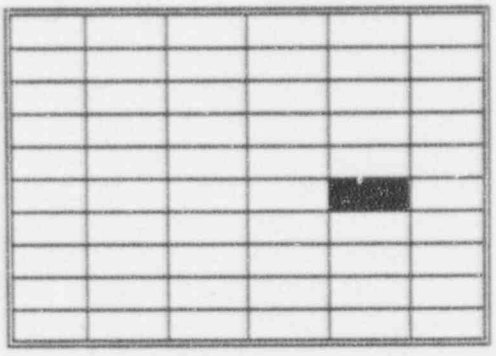
THE SYSTEM CONSISTS OF FOUR DETECTORS (ONE FOR EACH PHASE AND ONE FOR THE #8 BEARING) WHICH ARE MONITORED INDIVIDUALLY. THE SYSTEM CYCLES THROUGH ALL FOUR POINTS, AND IF ONE EXCEEDS THE ALARM VALUE THE ALARM IS SOUNDED.

THE SYSTEM ENGINEER CAN ASSIST IN DETERMINING IF A VALID CONDITION EXISTS IN THE GENERATOR OR IF THE RF MONITORING EQUIPMENT IS FAILED.

REFERENCES: DRAWING 208-057 TB-033

SENSING ELEMENT: TB-449-SS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-05-06	0-05-06



TURB GEN CONDITION MON HIGH

EVENT POINT 1956

INDICATED CONDITION:

- HYDROGEN COOLING GAS CONTAMINATED WITH HIGH CONCENTRATION OF PARTICLES INSIDE MAIN ELECTRICAL GENERATOR.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- HIGH ALARM ON TB-448-AIR TGR SECTION, REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY CONDITION ON TB-448-AIR, TGR SECTION, REAR MCB.
- REFER TO OP-701.
- NOTIFY CHEMISTRY TO TAKE BACKUP SAMPLE.

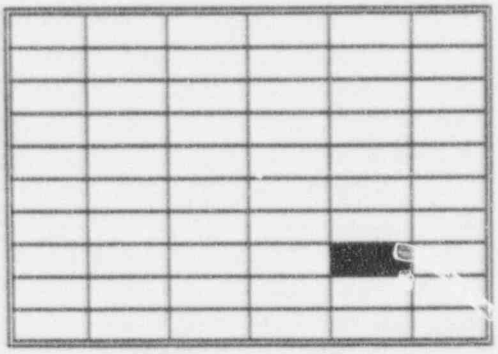
DISCUSSION:

THIS ALARM SERVES AS A WARNING OF GENERATOR FAILURE SUCH AS INSULATION BREAKDOWN AND/OR GAS SPACE IMPURITIES THAT MAY HAVE ENTERED THE GAS SPACES.

REFERENCES: DRAWING 208-057 TB-033

SENSING ELEMENT: TB-448-AT

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-05-08	0-05-08



**GEN AIR SIDE
DC SEAL PP
OUT OF SERVICE**

EVENT POINT 1676

INDICATED CONDITION:

- TBP-10 LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- HYDROGEN PANEL ALARM.

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE CAUSE OF LOSS OF POWER.
- NOTIFY CHEMISTRY TO MONITOR GENERATOR AREA FOR HYDROGEN CONCENTRATION.

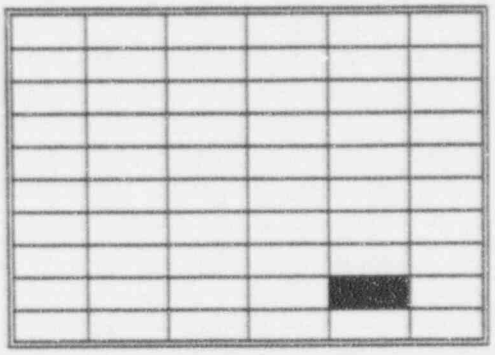
DISCUSSION:

TBP-10 IS POWERED FROM DPDP-3B SWITCH #13. IF THIS CIRCUIT IS DEENERGIZED THEN THIS ALARM IS RECEIVED. THE CONTROL CIRCUIT FOR TBP-10 IS POWERED FROM DPDP-3B SWITCH #17. NO ALARM IS ASSOCIATED WITH A LOSS OF POWER ON THIS POWER SUPPLY.

REFERENCES: DRAWING 208-057 TB-13

SENSING ELEMENT: 3CR RELAY

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-05-09	O-05-09



HYDROGEN PANEL TROUBLE

EVENT POINT 1644

INDICATED CONDITION:

- AT LEAST 1 OF 13 DROP TARGETS HAS FALLEN ON THE HYDROGEN ALARM PANEL.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE HYDROGEN ALARM PANEL.
- REFER TO AR-921.

DISCUSSION:

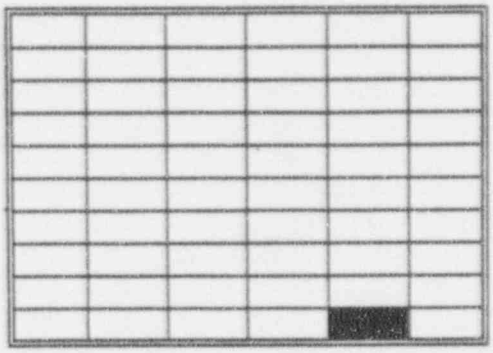
THE FOLLOWING CONDITIONS ARE ALARMED AT THE HYDROGEN ALARM PANEL:

H_2 PURITY HIGH/LOW	H_2 PRESSURE HIGH/LOW	H_2 SUPPLY PRESS LOW	H_2 TEMPERATURE HIGH	H_2 SIDE LEVEL LOW
SEAL OIL PRESS LOW	WATER DETECTED HIGH ALARM	SEAL OIL TURBINE B/U PRESS LOW		DEFOAMING TANK LEVEL HIGH
AIR SIDE SEAL OIL PUMP OFF	H_2 SIDE SEAL OIL PUMP OFF	AIR SIDE SEAL OIL B/U PUMP RUN		ALARM PANEL DC POWER FAIL

REFERENCES: DRAWING 208-057 TB-17

SENSING ELEMENT: VARIOUS INPUTS TO HYDROGEN ALARM PANEL

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-05-10	0-05-10



HYDROGEN SUPPLY PRESS LOW

EVENT POINT 1524

INDICATED CONDITION:

- HYDROGEN MANIFOLD SUPPLY PRESSURE **<80 PSIG** AS SENSED BY HY-81-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

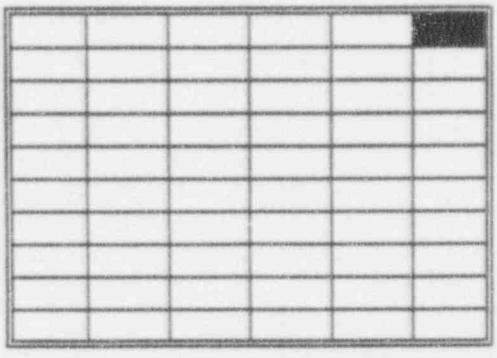
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE HYDROGEN TANK PRESSURE.

DISCUSSION:

REFERENCES: DRAWING 209-043 (NG-01)

SENSING ELEMENT: HY-81-PS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-01	O-06-01



GENERATOR TRIP

EVENT POINT 0683

INDICATED CONDITION:

- GENERATOR NEUTRAL GROUND LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

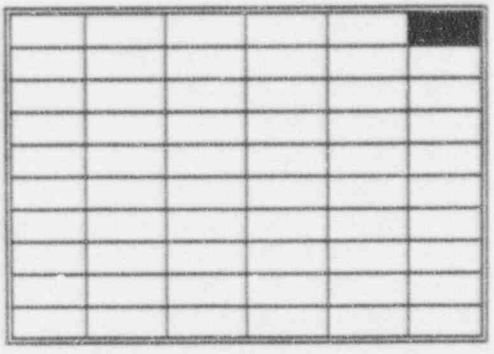
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-71

SENSING ELEMENT: 86GG-2

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0684

INDICATED CONDITION:

- STEP-UP TRANSFORMER/GENERATOR DIFFERENTIAL LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

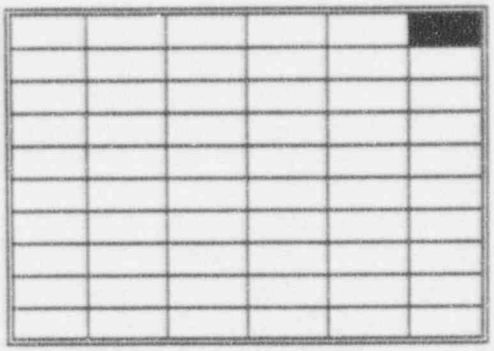
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-72

SENSING ELEMENT: 186T-2X

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-01	O-06-01



GENERATOR TRIP

EVENT POINT 0685

INDICATED CONDITION:

- GENERATOR DIFFERENTIAL LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

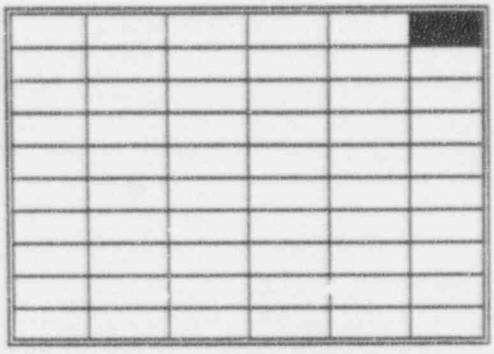
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-73

SENSING ELEMENT: 86G-2

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0686

INDICATED CONDITION:

- GENERATOR BACKUP AND NEGATIVE SEQUENCE LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

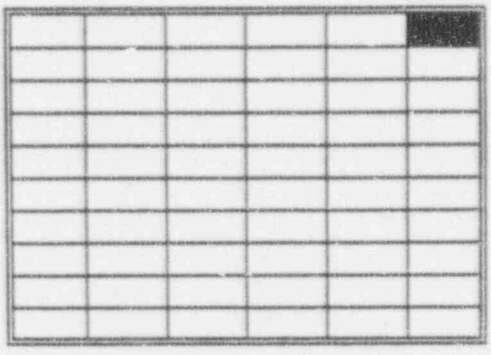
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-74

SENSING ELEMENT: 86BUB-2

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0687

INDICATED CONDITION:

- GENERATOR FIELD FAILURE LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

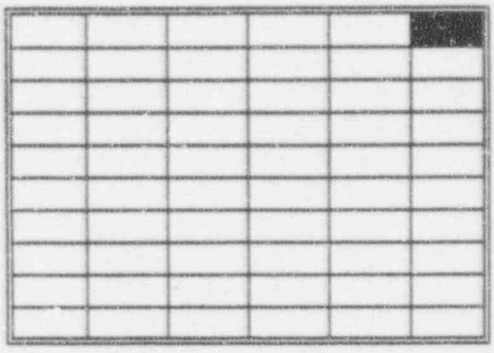
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-75

SENSING ELEMENT: 86FF-2

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0690

INDICATED CONDITION:

- STEP-UP TRANSFORMER SUDDEN PRESSURE LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

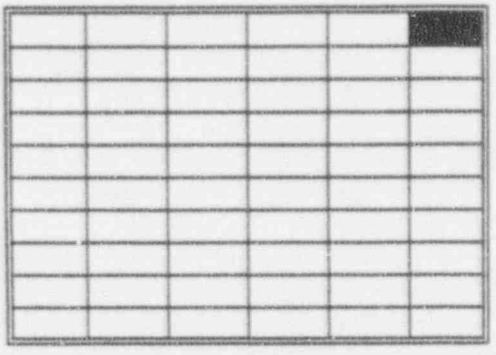
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-80

SENSING ELEMENT: 86SPSU-2X

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0720

INDICATED CONDITION:

- EXCITER OVERCURRENT AND GENERATOR VOLTAGE/FREQUENCY LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

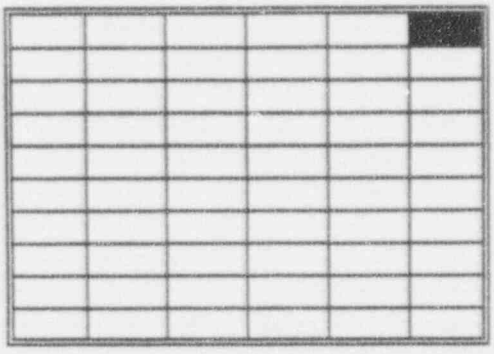
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-78

SENSING ELEMENT: 86EX6-2

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0825

INDICATED CONDITION:

- 500 KV SUBSTATION PRIMARY TRIP LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE GENERATOR FEED AUX ASMBLY SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

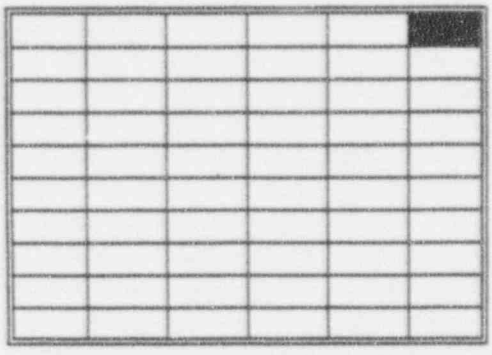
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-079 SB-03

SENSING ELEMENT: 86/UTPX

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-01	0-06-01



GENERATOR TRIP

EVENT POINT 0826

INDICATED CONDITION:

- 500 KV SUBSTATION ALTERNATE TRIP LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE GENERATOR FEED AUX ASMBLY SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

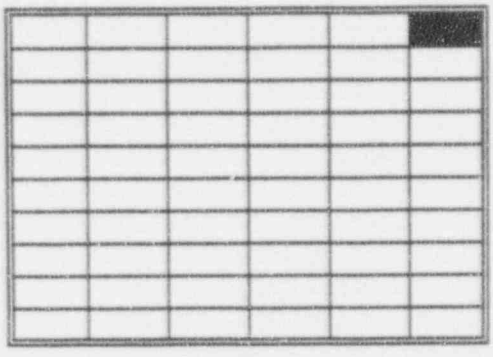
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-079 SB-04

SENSING ELEMENT: 86/UTAX

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-01	O-06-01



GENERATOR TRIP

EVENT POINT 1176

INDICATED CONDITION:

- REACTOR TRIPPED LOCKOUT RELAY TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIPPED INDICATION ON EHC PANEL.
- LOCKOUT RELAY AMBER INDICATING LIGHT IS OFF, LOCATED ON THE SSR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

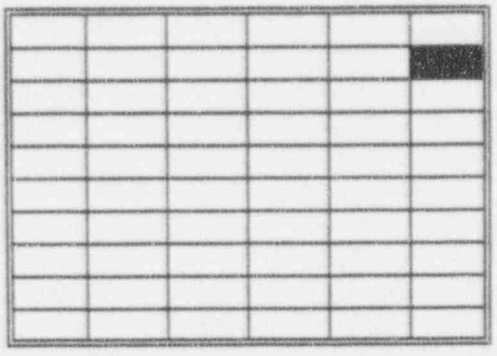
- REFER TO AP-580.
- REFER TO AP-660.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-98

SENSING ELEMENT: 86REC

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-02	O-06-02



EXCITER BREAKER TRIP

EVENT POINT 1648

INDICATED CONDITION:

- EXCITATION REGULATOR SUPPLY BREAKER TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON CONTROL STATION.
- EXCITER CURRENT INDICATION ON MAIN CONTROL BOARD.

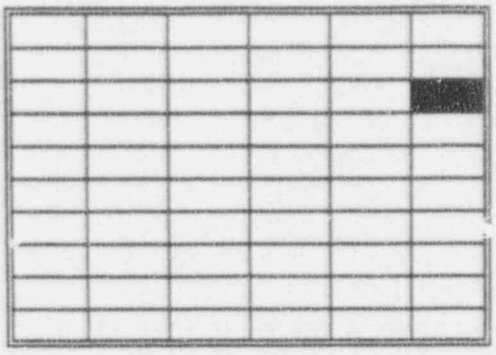
OPERATOR ACTIONS FOR A VALID ALARM:

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-09

SENSING ELEMENT:CS/SC,CS/O CONTROL SWITCH CONTACTS,41AX1/B BREAKER CONTACT

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-03	0-06-03



**GEN
VOLT/HERTZ
PRETRIP**

EVENT POINT 1651

INDICATED CONDITION:

- EXCESSIVE VOLTAGE TO HERTZ RATIO.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE SPEED INDICATION.
- UNIT VOLTAGE INDICATION.
- EXCITER CURRENT INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- RESTORE SPEED TO SYNCHRONOUS SPEED.
- IF SPEED CANNOT BE INCREASED, TRIP THE FIELD BREAKER.

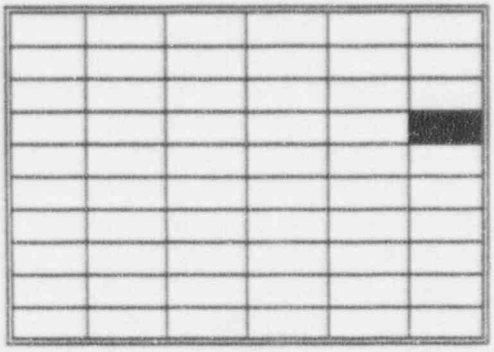
DISCUSSION:

THE POTENTIAL FOR DAMAGE OCCURS WHEN MAGNETIC DEVICES ARE SATURATED BY EXCESSIVE EXCITATION IN AN ATTEMPT TO MAINTAIN OUTPUT VOLTAGE WHEN SPEED IS DECREASING. THIS ALARM IS A TRUE PRETRIP CONDITION TO THE VOLTS/HERTZ 86 LOCKOUT RELAY WHICH INITIATES A TURBINE TRIP.

REFERENCES: DRAWING 208-057 TB-18

SENSING ELEMENT: 59/81 CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-04	O-06-04



GENERATOR UNDER FREQUENCY

EVENT POINT 1199

INDICATED CONDITION:

- GENERATOR FREQUENCY **<58.5 HERTZ** AS SENSED BY UNDERFREQUENCY CIRCUIT #F2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GENERATOR FREQUENCY INDICATION ON MAIN CONTROL BOARD.
- UNDERFREQUENCY TIMER F2 OPERATING, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER.

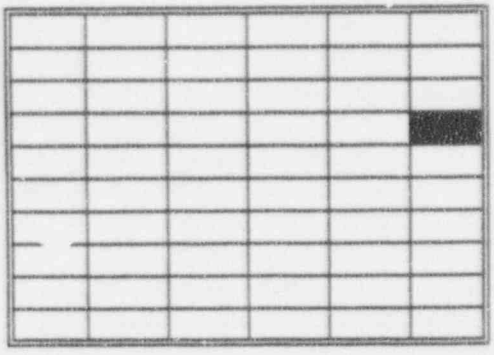
DISCUSSION:

UNIT #3'S FREQUENCY CORRECTION CIRCUITS ARE DISABLED. ANY SYSTEM FREQUENCY PROBLEMS SHOULD BE DIRECTED TO THE SYSTEM DISPATCHER FOR CORRECTION. THE GENERATOR LOCKOUT TRIP ON UNDERFREQUENCY IS AT 58 HERTZ DECREASING.

REFERENCES: DRAWING 208-040 MT-102

SENSING ELEMENT: CP/58.5HZ/F2

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-04	O-06-04



GENERATOR UNDER FREQUENCY

EVENT POINT 1200

INDICATED CONDITION:

- GENERATOR FREQUENCY **<59.5 HERTZ** AS SENSED BY UNDERFREQUENCY CIRCUIT #F1.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GENERATOR FREQUENCY INDICATION ON MAIN CONTROL BOARD.
- UNDERFREQUENCY TIMER F1 OPERATING, LOCATED ON THE TGR SECTION OF THE REAR MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER.

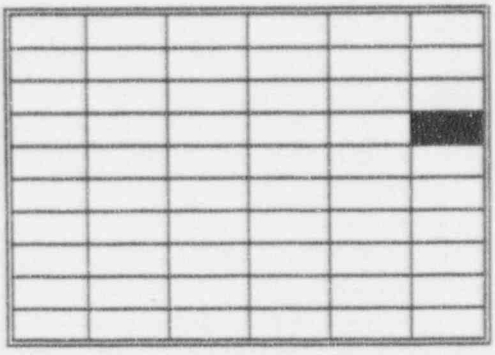
DISCUSSION:

UNIT #3'S FREQUENCY CORRECTION CIRCUITS ARE DISABLED. ANY SYSTEM FREQUENCY PROBLEMS SHOULD BE DIRECTED TO THE SYSTEM DISPATCHER FOR CORRECTION. THE GENERATOR LOCKOUT TRIP ON UNDERFREQUENCY IS AT 58 HERTZ DECREASING.

REFERENCES: DRAWING 208-040 MT-102

SENSING ELEMENT: CQ/59.5HZ/F1

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-04	0-06-04



GENERATOR UNDER FREQUENCY

EVENT POINT 1999

INDICATED CONDITION:

- GENERATOR FREQUENCY **<58 HERTZ** FOR **>12 SECONDS** AS SENSED BY UNDERFREQUENCY CIRCUIT #T3.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- TURBINE TRIP

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-580.
- REFER TO AP-660.
- NOTIFY SYSTEM DISPATCHER.

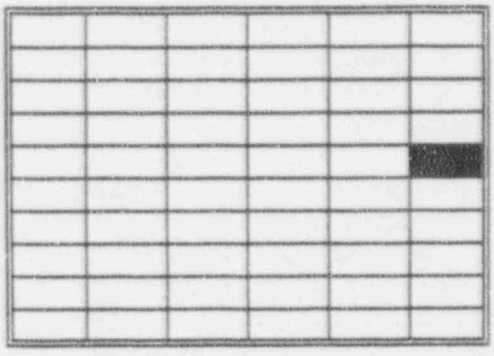
DISCUSSION:

THE DESIGN BEHIND THIS CIRCUIT WAS TO ALLOW UNIT #3 AUXILIARY LOADS TO REMAIN POWERED FROM THE AUXILIARY TRANSFORMER AFTER A SYSTEM FREQUENCY DISTURBANCE BY OPENING THE UNITS OUTPUT BREAKERS AND ALLOWING THE UNIT TO RUNBACK TO THE ICS MINIMUM LOAD SETTING. HOWEVER, A 500 KV SUBSTATION CONTACT NOW ENERGIZES 86/UTPX WHEN THE 12 SECOND TIMER ELAPSES, AND A TURBINE TRIP RESULTS. (SEE DRAWINGS 208-079 SB-03,SB-05)

REFERENCES: DRAWING 208-040 MT-102

SENSING ELEMENT: CN/58HZ/T3

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-05	O-06-05



EXCITER FIRING CKT POWER LOSS

EVENT POINT 1653

INDICATED CONDITION:

- LOSS OF POWER SUPPLY TO EXCITER FIRING CIRCUIT DRAWER #1.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF POWER.
- CHECK FIRING CIRCUIT DRAWER #1 POWER SUPPLY FUSE

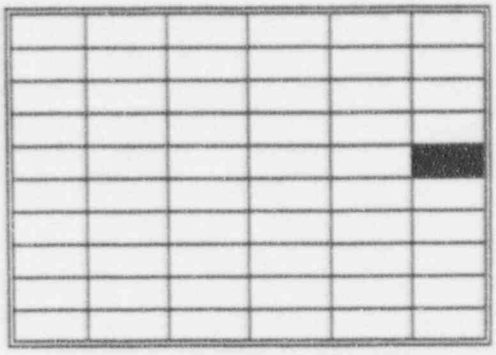
DISCUSSION:

THE FIRING CIRCUIT DRAWERS ARE REDUNDANT AND IN PARALLEL. THEY SUPPLY FIRING PULSES TO THE INVERTER TYPE POWER AMPLIFIER. EITHER FIRING CIRCUIT DRAWER WILL PROVIDE SERVICE, BUT THE LOSS OF POWER SHOULD BE INVESTIGATED AND CORRECTED.

REFERENCES: DRAWING 208-057 TB-18

SENSING ELEMENT: FIRING CIRCUIT #1

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-05	0-06-05



EXCITER FIRING CKT POWER LOSS

EVENT POINT 1654

INDICATED CONDITION:

- LOSS OF POWER SUPPLY TO EXCITER FIRING CIRCUIT DRAWER #2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF POWER.
- CHECK FIRING CIRCUIT DRAWER #2 POWER SUPPLY FUSE

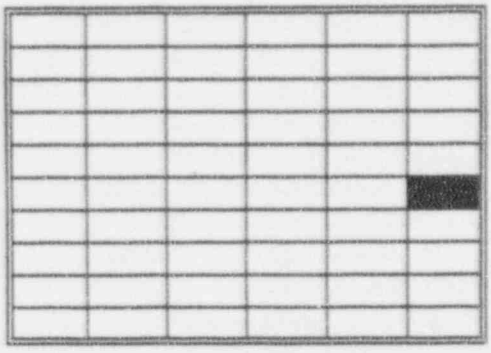
DISCUSSION:

THE FIRING CIRCUIT DRAWERS ARE REDUNDANT AND IN PARALLEL. THEY SUPPLY FIRING PULSES TO THE INVERTER TYPE POWER AMPLIFIER. EITHER FIRING CIRCUIT DRAWER WILL PROVIDE SERVICE, BUT THE LOSS OF POWER SHOULD BE INVESTIGATED AND CORRECTED.

REFERENCES: DRAWING 208-057 TB-18

SENSING ELEMENT: FIRING CIRCUIT #2

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-06	O-06-06



EXCITER GROUND

EVENT POINT 1656

INDICATED CONDITION:

- EXCITER CIRCUIT GROUND DETECTED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF EXCITER GROUND.
- NOTIFY SYSTEM ENGINEERING.

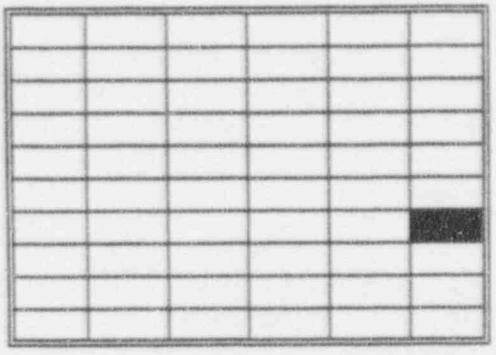
DISCUSSION:

THE INSTALLED GROUND DETECTOR PERFORMS AN AUTOMATIC GROUND CHECK ONCE EACH 24 HOURS, USUALLY ON THE MIDNIGHT SHIFT. IT WILL ANNUNCIATE FOR ALL VALUES OF INSULATION RESISTANCE BELOW 13K OHMS, AND BETWEEN 13K OHMS AND 100K OHMS DEPENDING ON GROUND LOCATION. ANY VALUE ABOVE 100K OHMS IS CONSIDERED SATISFACTORY.

REFERENCES: DRAWING 208-057 TB-18

SENSING ELEMENT: EXCITER SWITCHGEAR 64 CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-07	O-06-07



EXCITER LIMITED PRETRIP

EVENT POINT 1650

INDICATED CONDITION:

- EXCITER EXCITATION IS HIGHER THAN A PRESET VALUE.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- EXCITER VOLTAGE INDICATION ON MAIN CONTROL BOARD.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE EXCITER EXCITATION TO NORMAL VALUES BASED ON VOLTAGE INDICATION.

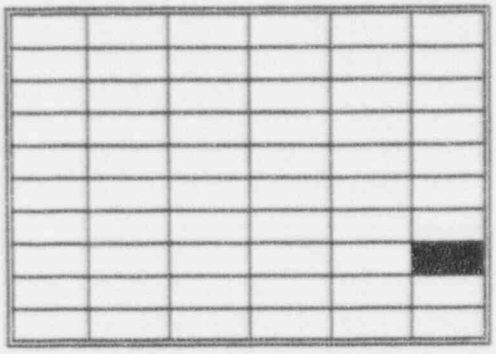
DISCUSSION:

OVEREXCITATION RESULTS IN EXCESSIVE TEMPERATURE OF THE SYNCHRONOUS FIELD WINDINGS. THIS ALARM, CALLED AN "EXCITATION FORCING ALARM" WARNS THAT EXCITATION PRESET VALUES HAVE BEEN EXCEEDED.

REFERENCES: DRAWING 208-057 TB-18

SENSING ELEMENT: EXCITER SWITCHGEAR K4 CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-08	0-06-08



EXCITER RAISE INHIBIT

EVENT POINT 1522

INDICATED CONDITION:

WITH UNIT OUTPUT BREAKERS OPEN **AND** THE FOLLOWING:

- GENERATOR EXCITER HAS REACHED AN EXCITATION LIMIT IMPOSED.

OR

- GENERATOR EXCITER HAS REACHED A CURRENT LIMIT IMPOSED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GENERATOR OUTPUT VOLTAGE WILL NOT INCREASE WHEN EITHER THE BASE ADJUST OR VOLTAGE ADJUST KNOBS ARE INCREASED.

OPERATOR ACTIONS FOR A VALID ALARM:

- REDUCE EXCITER EXCITATION TO NORMAL VALUES BASED ON VOLTAGE INDICATION.
- IF EXCITATION APPEARS NORMAL BUT THE ALARM WILL NOT CLEAR, NOTIFY SYSTEM ENGINEERING TO EVALUATE THE PROBLEM.

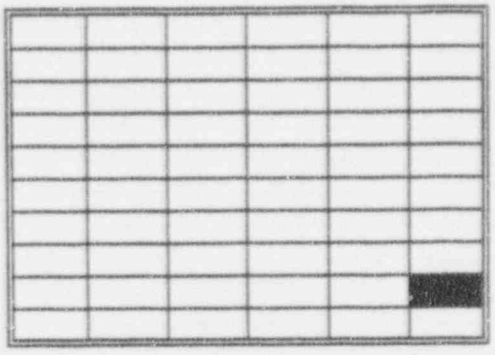
DISCUSSION:

OVEREXCITATION RESULTS IN EXCESSIVE TEMPERATURE OF THE SYNCHRONOUS FIELD WINDINGS. THIS ALARM MAY ANNUNCIATE TEMPORARILY DURING RELAY OPERATION FOR STARTUP AND OTHER TIMES WITH THE MAIN GENERATOR IN A NO-LOAD CONDITION.

REFERENCES: DRAWING 208-057 TB-18

SENSING ELEMENT: EXCITER SWITCHGEAR DX3 CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-09	0-06-09



**GEN RELAY
POT XFMR
FAILURE**

EVENT POINT 0688

INDICATED CONDITION:

- GENERATOR POTENTIAL TRANSFORMER FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE LOSS OF GENERATOR POTENTIAL TRANSFORMER.

DISCUSSION:

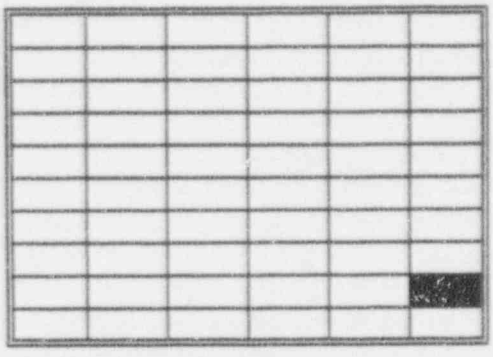
LOSS OF THE GENERATOR POTENTIAL TRANSFORMER WILL HAVE UNPREDICTABLE EFFECTS ON THE OPERATION OF THE GENERATOR BACKUP RELAY (ie. MAY CAUSE IT TO ACTUATE INADVERTENTLY OR FAIL TO OPERATE FOR A VALID CONDITION).

THE GENERATOR BACKUP RELAY PROVIDES TRIP FUNCTION FOR THE MAIN GENERATOR OUTPUT BREAKERS FOR GENERATOR OR BUS ELECTRICAL FAULTS.

REFERENCES: DRAWING 208-040 MT-76

SENSING ELEMENT: K60/A RELAY CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-09	O-06-09



**GEN RELAY
PGT XFMR
FAILURE**

EVENT POINT 0689

INDICATED CONDITION:

- EXCITER POTENTIAL TRANSFORMER FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE LOSS OF EXCITER POTENTIAL TRANSFORMER.

DISCUSSION:

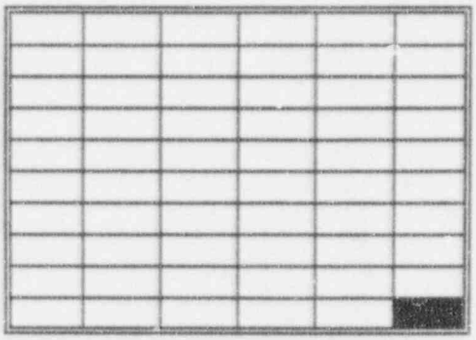
LOSS OF THE EXCITER POTENTIAL TRANSFORMER WILL HAVE UNPREDICTABLE EFFECTS ON THE OPERATION OF THE GENERATOR FIELD FAILURE RELAY (ie. MAY CAUSE IT TO ACTUATE INADVERTENTLY OR FAIL TO OPERATE FOR A VALID CONDITION).

THE GENERATOR BACKUP RELAY PROVIDES TRIP FUNCTION FOR THE MAIN GENERATOR OUTPUT BREAKERS FOR GENERATOR OR BUS ELECTRICAL FAULTS.

REFERENCES: DRAWING 208-040 MT-76

SENSING ELEMENT: K60/B RELAY CONTACT

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-10	O-06-10



ISOLATED PHASE BUS DUCT TROUBLE

EVENT POINT 1645

INDICATED CONDITION:

- PHASE BUS DUCT BLOWER FAN 3A NOT RUNNING WITH SWITCH IN AUTO AND GENERATOR FIELD BREAKER CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

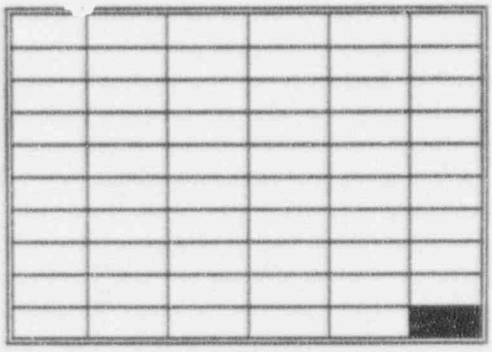
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE ISOLATED PHASE BUS DUCT COOLING SYSTEM.
- PLACE ALTERNATE PHASE BUS DUCT COOLING FAN IN OPERATION.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-23

SENSING ELEMENT: 42X/17CR, 42/16M RELAY CONTACTS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-10	0-06-10



ISOLATED PHASE BUS DUCT TROUBLE

EVENT POINT 1646

INDICATED CONDITION:

- PHASE BUS DUCT RETURN AIR TEMPERATURE **>151** °F AS SENSED BY TB-338-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

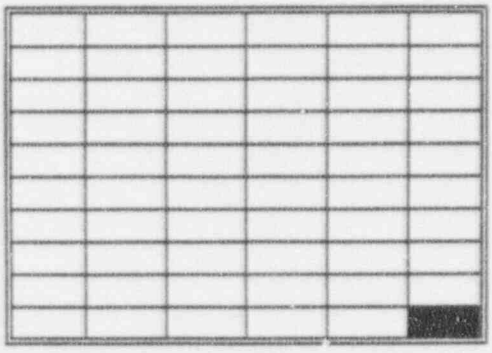
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE ISOLATED PHASE BUS DUCT COOLING SYSTEM.
- SC COOLING WATER IS LINED UP TO THE BUS DUCT COOLER.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-23

SENSING ELEMENT: TB-338-TS

TGF 0 ANNUNCIATOR RESPONSE	TGF-AX3-06-10	0-06-10



ISOLATED PHASE BUS DUCT TROUBLE

EVENT POINT 1647

INDICATED CONDITION:

- PHASE BUS DUCT AIR FLOW LOW AS SENSED BY TB-338-FS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

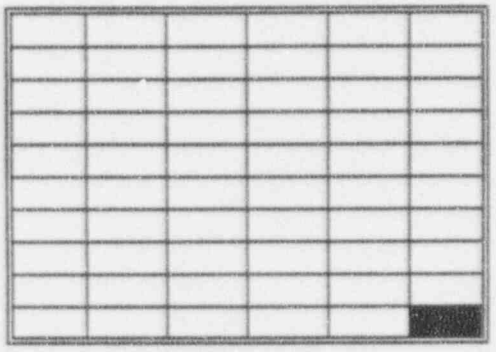
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE ISOLATED PHASE BUS DUCT COOLING SYSTEM.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-23

SENSING ELEMENT: TB-339-FS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-10	O-06-10



ISOLATED PHASE BUS DUCT TROUBLE

EVENT POINT 1652

INDICATED CONDITION:

- PHASE BUS DUCT AIR HUMIDITY **>50%** AS SENSED BY TB-341-HS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

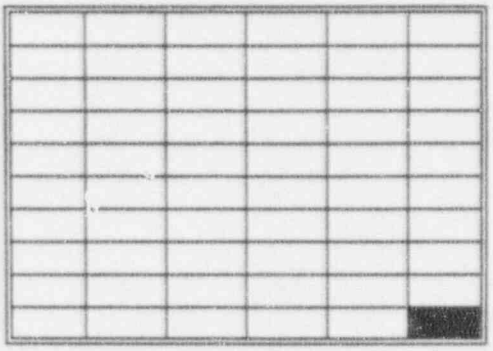
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE ISOLATED PHASE BUS DUCT COOLING SYSTEM.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-23

SENSING ELEMENT: TB-341-HS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-10	O-06-10



ISOLATED PHASE BUS DUCT TROUBLE

EVENT POINT 1655

INDICATED CONDITION:

- PHASE BUS DUCT BLOWER FAN 3B NOT RUNNING WITH SWITCH IN AUTO AND GENERATOR FIELD BREAKER CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

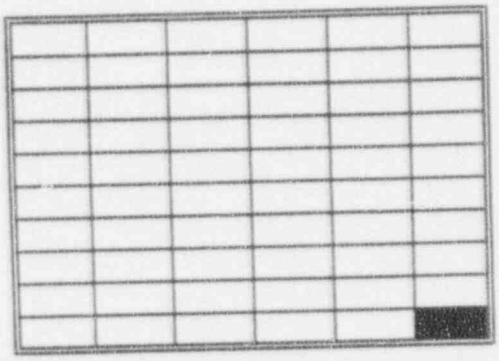
- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE ISOLATED PHASE BUS DUCT COOLING SYSTEM.
- PLACE ALTERNATE PHASE BUS DUCT COOLING FAN IN OPERATION.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-23

SENSING ELEMENT: 42X/25CR, 42/19M RELAY CONTACTS

TGF O ANNUNCIATOR RESPONSE	TGF-AX3-06-10	0-06-10



ISOLATED PHASE BUS DUCT TROUBLE

EVENT POINT 1675

INDICATED CONDITION:

- PHASE BUS DUCT AIR FILTER DIFFERENTIAL PRESSURE >1" H_2O AS SENSED BY TB-340-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SECONDARY PLANT OPERATOR TO INVESTIGATE ISOLATED PHASE BUS DUCT COOLING SYSTEM AIR FILTER, AND REPLACE AS REQUIRED.

DISCUSSION:

REFERENCES: DRAWING 208-057 TB-23

SENSING ELEMENT: TB-340-PS

Rev. 12 04/08/93

Effective Date 4/14/93

Document Section
INFORMATION ONLY
C. R. Nuclear

ANNUNCIATOR RESPONSE

AR-702

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

SSF Q ANNUNCIATOR RESPONSE

THIS 'OCEDURE ADDRESSES SAFETY RELATED COMPONENTS

APPROVED BY: Interpretation Contact

W. Marshall

DATE: 4/13/93

INTERPRETATION CONTACT: Manager, Nuclear Plant Operations

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ENCLOSURES

1	Annunciator Response	2

1.0 PURPOSE

1.1 Establish a reference document for each Annunciator Window on the SSF-A2 Lampbox.

1.2 Establish operator actions for valid Annunciator alarms on the SSF-A2 Lampbox.

1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the SSF-A2 Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

2.1.1 AP-770, Emergency Diesel Generator Actuation

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-224-049

3.0 PERSONNEL INDOCTRINATION

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

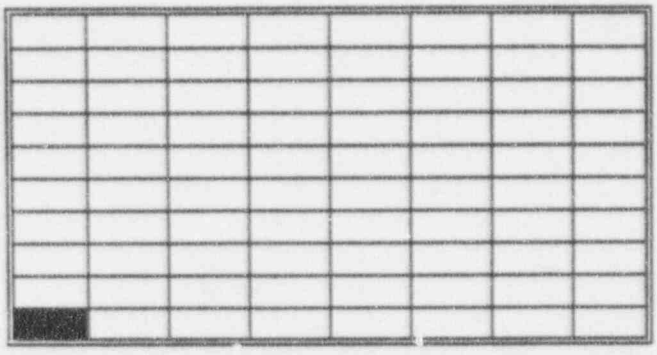
4.0 INSTRUCTIONS

4.1 Respond to alarms on the SSF-A2 Lampbox as indicated on Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP-ACTIONS

None

SSF ANNUNCIATOR RESPONSE	SSF-A2-1-10	Q-1-10



BUS PARALLELED

EVENT POINT 0540

INDICATED CONDITION:

- "A" 6900V RX AUX BUS BREAKERS 3101 AND 3103 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER POSITION INDICATION FOR BREAKERS 3101 AND 3103.

OPERATOR ACTIONS FOR A VALID ALARM:

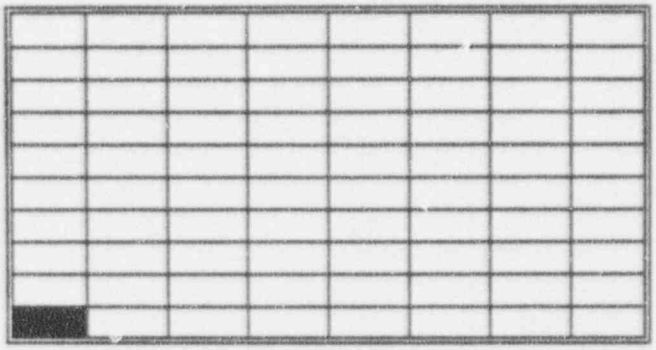
DISCUSSION:

THIS IS A NORMAL ALARM WHILE TRANSFERRING BUSSES TO ALTERNATE SUPPLIES WHEN MORE THAN ONE SUPPLY BREAKER IS CLOSED.

REFERENCES: DRAWING 208-040 MT-03

SENSING ELEMENT: 3101/52A CONTACT AND 3103/52A CONTACT (6900V BREAKERS)

SSF ANNUNCIATOR RESPONSE	SSF-A2-1-10	Q-1-10



BUS PARALLELED

EVENT POINT 0543

INDICATED CONDITION:

- "B" 6900V RX AUX BUS BREAKERS 3102 AND 3104 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER POSITION INDICATION FOR BREAKERS 3102 AND 3104.

OPERATOR ACTIONS FOR A VALID ALARM:

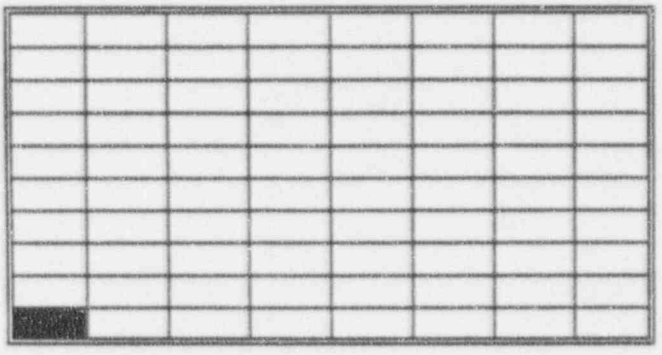
DISCUSSION:

THIS IS A NORMAL ALARM WHILE TRANSFERRING BUSSES TO ALTERNATE SUPPLIES WHEN MORE THAN ONE SUPPLY BREAKER IS CLOSED.

REFERENCES: DRAWING 208 040 MT-04

SENSING ELEMENT: 3102/52A CONTACT AND 3104/52A CONTACT (6900V BREAKERS)

SSF ANNUNCIATOR RESPONSE	SSF-A2-1-10	Q-1-10



BUS PARALLELED

EVENT POINT 0546

INDICATED CONDITION:

- "A" 4160V UNIT BUS BREAKERS 3201 AND 3203 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER POSITION INDICATION FOR BREAKERS 3201 AND 3203.

OPERATOR ACTIONS FOR A VALID ALARM:

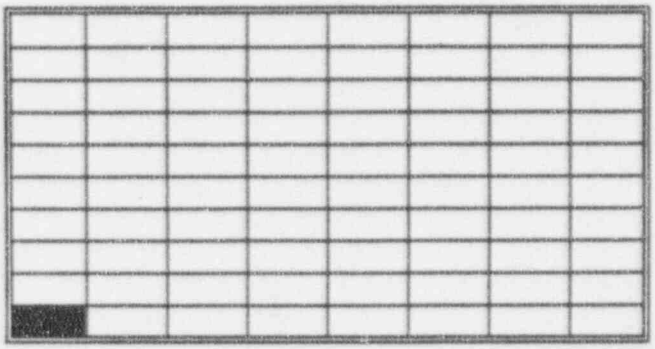
DISCUSSION:

THIS IS A NORMAL ALARM WHILE TRANSFERRING BUSSES TO ALTERNATE SUPPLIES WHEN MORE THAN ONE SUPPLY BREAKER IS CLOSED.

REFERENCES: DRAWING 208-040 MT-05

SENSING ELEMENT: 3201/52A CONTACT AND 3203/52A CONTACT (4160V BREAKERS)

SSF ANNUNCIATOR RESPONSE	SSF-A2-1-10	Q-1-10



BUS PARALLELED

EVENT POINT 0549

INDICATED CONDITION:

- "B" 4160V UNIT BUS BREAKERS 3202 AND 3204 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER POSITION INDICATION FOR BREAKERS 3202 AND 3204.

OPERATOR ACTIONS FOR A VALID ALARM:

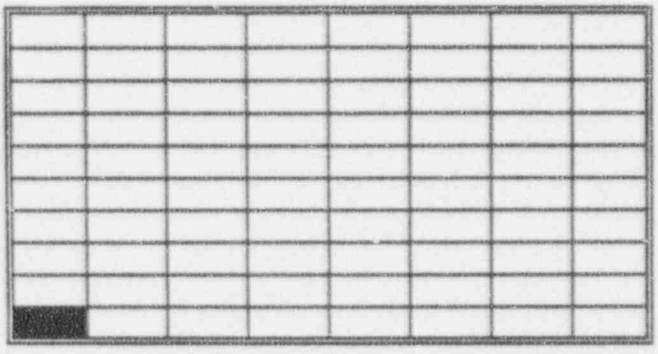
DISCUSSION:

THIS IS A NORMAL ALARM WHILE TRANSFERRING BUSSES TO ALTERNATE SUPPLIES WHEN MORE THAN ONE SUPPLY BREAKER IS CLOSED.

REFERENCES: DRAWING 208-040 MT-06

SENSING ELEMENT: 3202/52A CONTACT AND 3204/52A CONTACT (4160V BREAKERS)

SSF ANNUNCIATOR RESPONSE	SSF-A2-1-10	Q-1-10



BUS PARALLELED

EVENT POINT 0556

INDICATED CONDITION:

- ANY COMBINATION OF "A" ES 4160V BUS BREAKERS 3205, 3207, 3209, 3211 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER POSITION INDICATION FOR BREAKERS 3205,3207,3209,3211.

OPERATOR ACTIONS FOR A VALID ALARM:

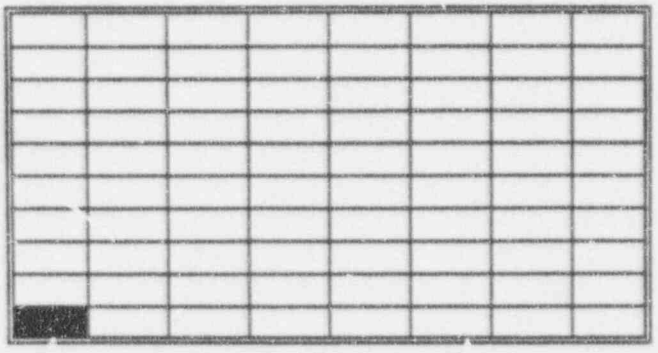
DISCUSSION:

THIS IS A NORMAL ALARM WHILE TRANSFERRING BUSSES TO ALTERNATE SUPPLIES WHEN MORE THAN ONE SUPPLY BREAKER IS CLOSED.

REFERENCES: DRAWING 208-040 MT-09

SENSING ELEMENT: 3205/52A, 3207/52A, 3209/52A, 3211/52A CONTACTS

SSF ANNUNCIATOR RESPONSE	SSF-A2-1-10	Q-1-10



BUS PARALLELED

EVENT POINT C560

INDICATED CONDITION:

- ANY COMBINATION OF "B" ES 4160V BUS BREAKERS 3206, 3208, 3210, 3212 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER POSITION INDICATION FOR BREAKERS 3206, 3208, 3210, 3212.

OPERATOR ACTIONS FOR A VALID ALARM:

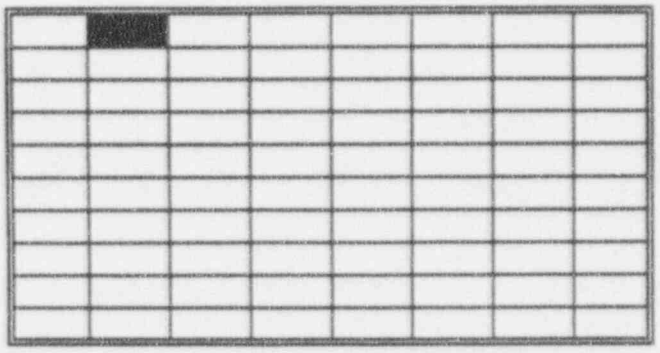
DISCUSSION:

THIS IS A NORMAL ALARM WHILE TRANSFERRING BUSSES TO ALTERNATE SUPPLIES WHEN MORE THAN ONE SUPPLY BREAKER IS CLOSED.

REFERENCES: DRAWING 208-040 MT-10

SENSING ELEMENT: 3206/52A, 3208/52A, 3210/52A, 3212/52A CONTACTS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-01	Q-2-01



4KV
ES BUS A
DEAD

EVENT POINT 0649

INDICATED CONDITION:

- "A" ES 4160V BUS UNDERVOLTAGE

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- "A" ES 4160V VOLTAGE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770.

DISCUSSION:

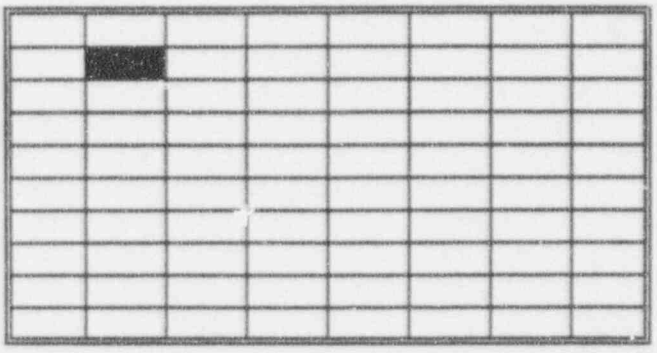
THIS ALARM IS THE RESULT OF A 2 OUT OF 3 UNDERVOLTAGE (FLUR) RELAY LOGIC.

THE FLUR RELAYS ARE INTENDED TO PROVIDE ES 4160VAC UNDERVOLTAGE RESPONSE WHEN VOLTAGE DROPS INSTANTLY TO ZERO. THE SLUR RELAY WILL PROVIDE UNDERVOLTAGE RESPONSE WHEN THE VOLTAGE DROPS GRADUALLY BELOW THE SLUR SETPOINT.

REFERENCES: DRAWING 208-040 MT-65

SENSING ELEMENT: 27Y-3/32EA RELAY

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-02	Q-2-02



DIESEL GEN A BREAKER TRIP

EVENT POINT 0568

INDICATED CONDITION:

- "A" EMERGENCY DIESEL GENERATOR OUTPUT BREAKER TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED FLAG WITH A GREEN LIGHT IS ON, LOCATED ON BREAKER 3209 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

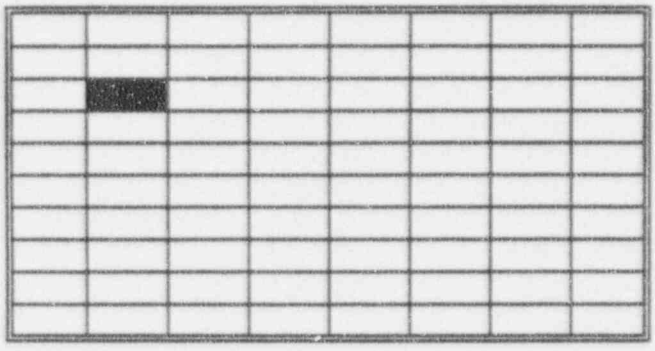
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-13

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

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-03	Q-2-03



DIESEL GEN A
BREAKER
CLOSED

EVENT POINT 1182

INDICATED CONDITION:

- "A" EMERGENCY DIESEL GENERATOR OUTPUT BREAKER CLOSED, WITH ES ACTUATION SIGNAL OR UNDERVOLTAGE SIGNAL PRESENT.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED LIGHT IS ON WITH A GREEN FLAG ON BREAKER 3209 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

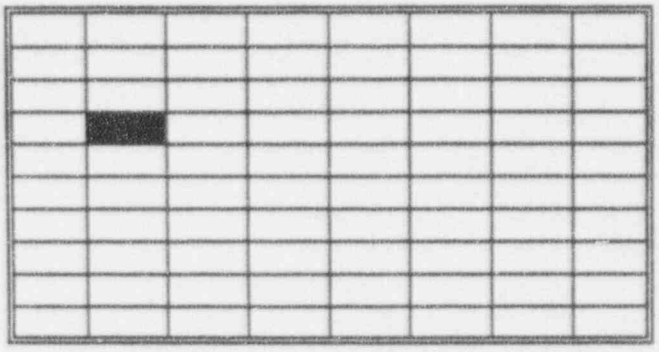
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-040 MI-129

SENSING ELEMENT: 86B/ESA

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-04	Q-2-04



4KV ES A CROSS-TIE BLOCKED

EVENT POINT 1183

INDICATED CONDITION:

- BREAKERS 3209 AND 3210 CLOSED WITH EITHER 3206, 3208, OR 3212 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GEN "A" CROSS-TIE LIGHT EXTINGUISHED.
- IF 3206 CLOSED, THEN BLOCK CLOSING ACTUATED 3205 LIGHT IS ON.
- IF 3208 CLOSED, THEN BLOCK CLOSING ACTUATED 3207 LIGHT IS ON.
- IF 3212 CLOSED, THEN BLOCK CLOSING ACTUATED 3211 LIGHT IS ON.

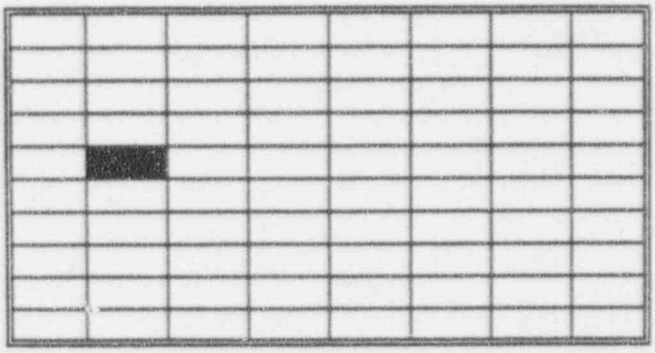
OPERATOR ACTIONS FOR A VALID ALARM:

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-129

SENSING ELEMENT: 3-52-1, 3-52S CONTACTS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-05	Q-2-05



DIESEL GEN A
VOLTAGE ADJ
IN CONTROL RM

EVENT POINT 1177

INDICATED CONDITION:

- DIESEL GENERATOR "A" VOLTAGE ADJUST SELECTED TO THE CONTROL ROOM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR A "EXC VOLT ADJ SELECT" SWITCH SELECTED TO "CONT RM" POSITION.

OPERATOR ACTIONS FOR A VALID ALARM:

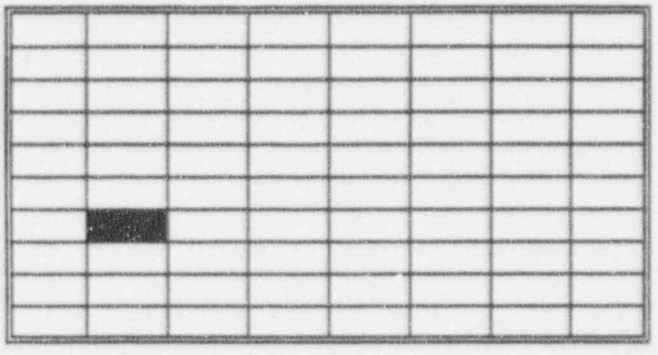
DISCUSSION:

THIS SWITCH IS NORMALLY SELECTED TO THE "DG RM" POSITION.

REFERENCES: DRAWING 208-027 EG-17

SENSING ELEMENT: SS/O,CB/SSF CONTACT

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-07	Q-2-07



480V
ES BUS A
DEAD

EVENT POINT 0653

INDICATED CONDITION:

- "A" ES 480V BUS UNDERVOLTAGE.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- 480V ES BUS "A" VOLTAGE INDICATES LESS THAN NORMAL.

OPERATOR ACTIONS FOR A VALID ALARM:

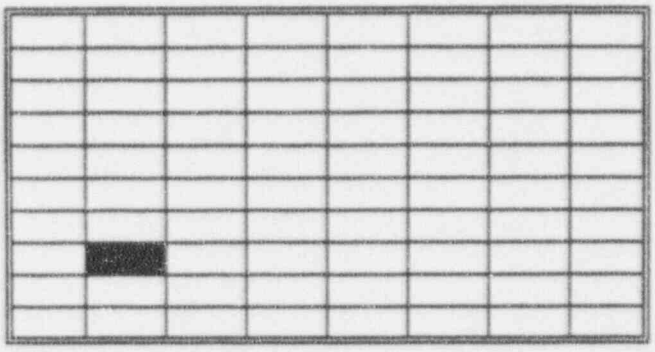
- REFER TO AP-770

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-66

SENSING ELEMENT: 27Y-1/33EA

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-08	Q-2-08



480V
ES BUS A
UV LOCKOUT ACT

EVENT POINT 0719

INDICATED CONDITION:

- "A" ES 480V BUS UNDERVOLTAGE LOCK OUT RELAY ACTUATED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- 4160V ES BUS "A" VOLTAGE INDICATES LESS THAN NORMAL.
- 480V ES BUS "A" VOLTAGE INDICATES LESS THAN NORMAL.
- BREAKER 3209 INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770

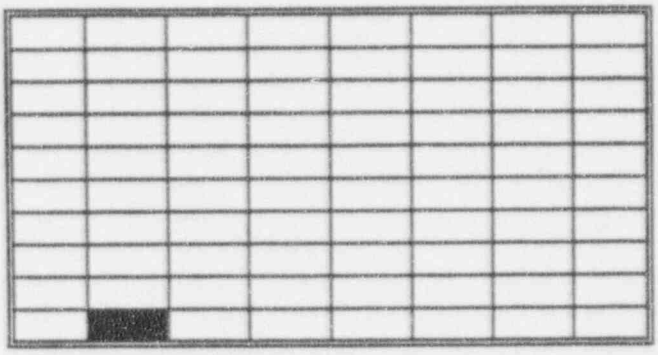
DISCUSSION:

THE 480V ES UNDERVOLTAGE LOCK OUT RELAY IS ACTUATED WHEN, EITHER THE "A" DIESEL OUTPUT BREAKER IS CLOSED, OR 4160V ES BUS A UNDERVOLTAGE OCCURS WITH AN ES ACTUATION.

REFERENCES: DRAWING 208-040 MT-77

SENSING ELEMENT: 86/27ESA

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0642

INDICATED CONDITION:

- "A" 6900V REACTOR AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

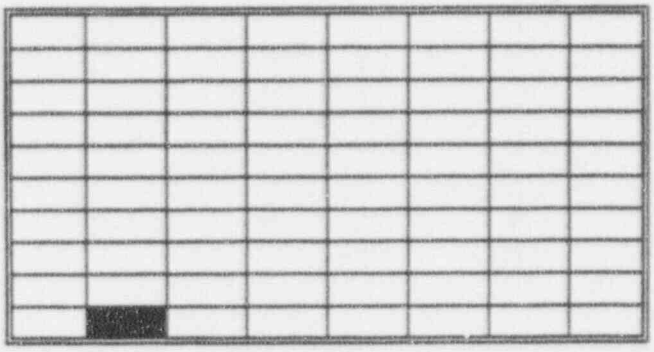
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-63

SENSING ELEMENT: 27Y-1/31RA 27Z/31RA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0644

INDICATED CONDITION:

- "B" 6900V REACTOR AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

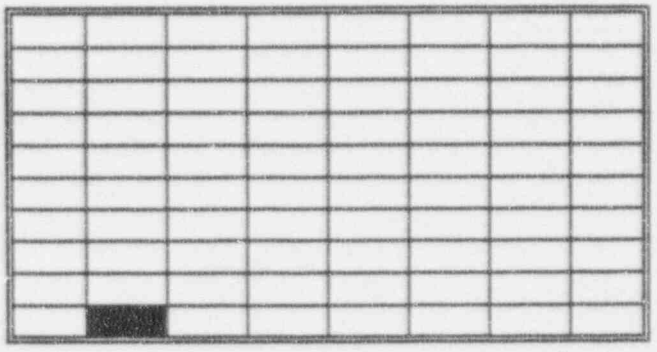
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-63

SENSING ELEMENT: 27Y-1/31RB 27Z/31RB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0646

INDICATED CONDITION:

- "A" 4160V UNIT BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

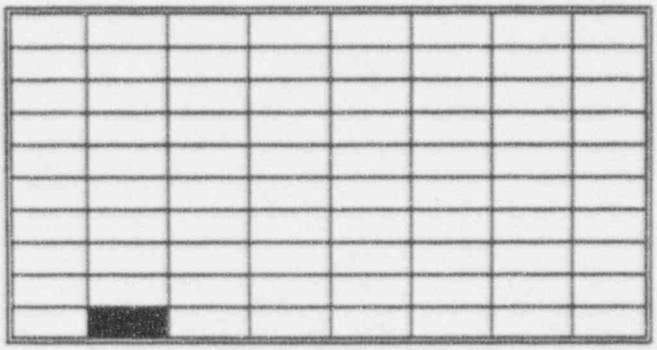
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-64

SENSING ELEMENT: 27Y-1/32UA 27Z/32UA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0648

INDICATED CONDITION:

- "B" 4160V UNIT BUS 3B UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

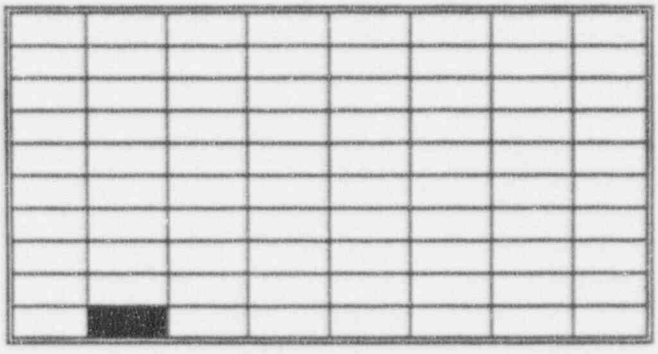
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-64

SENSING ELEMENT: 27Y-1/32UB 27Z/32UB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL
TRANSFORMER
TROUBLE

EVENT POINT 0650

INDICATED CONDITION:

- "A" ES 4160V BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

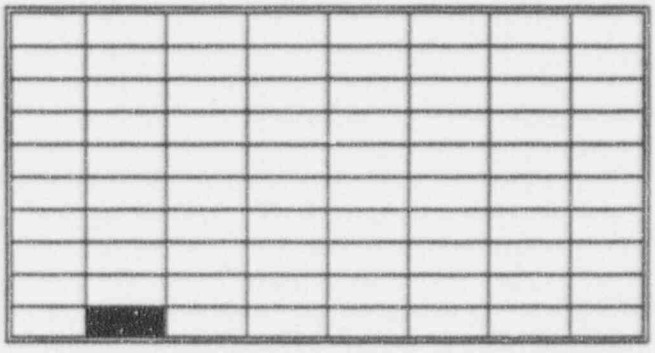
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-65

SENSING ELEMENT: 27Y-1/32EA 27Z/32EA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0652

INDICATED CONDITION:

- "B" ES 4160V BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

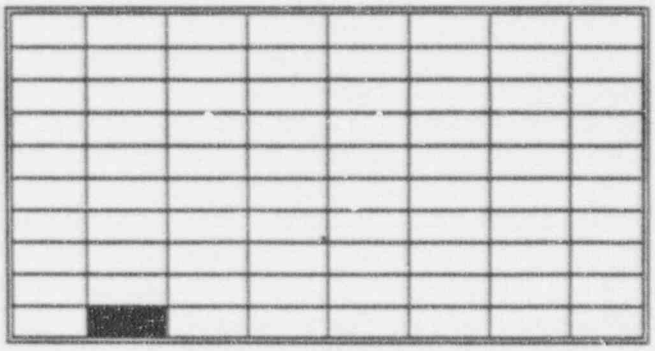
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-65

SENSING ELEMENT: 27Y-1/32EB 27Z/32EB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL
TRANSFORMER
TROUBLE

EVENT POINT 0654

INDICATED CONDITION:

- "A" ES 480V BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

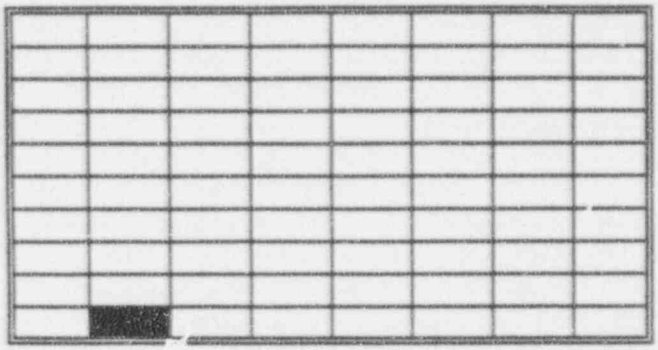
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-66

SENSING ELEMENT: 27Y-1/33EA 27Z/33EA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL
TRANSFORMER
TROUBLE

EVENT POINT 0656

INDICATED CONDITION:

- "B" ES 480V BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

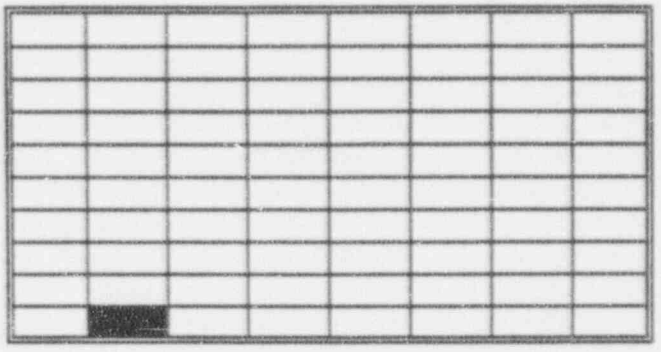
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-66

SENSING ELEMENT: 27Y-1/33EB 27Z/33EB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0658

INDICATED CONDITION:

- "A" 480V REACTOR AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

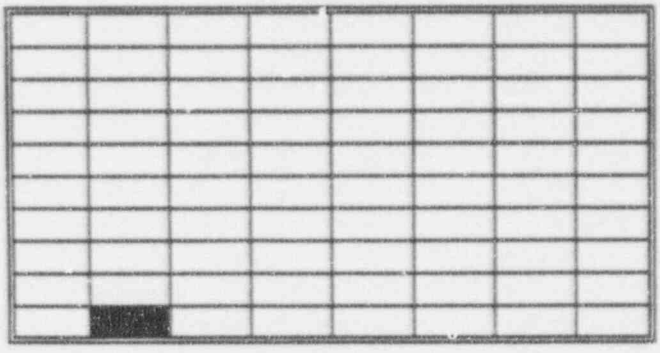
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-67

SENSING ELEMENT: 27Y-1/33RA 27Z/33RA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0660

INDICATED CONDITION:

- "B" 480V REACTOR AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

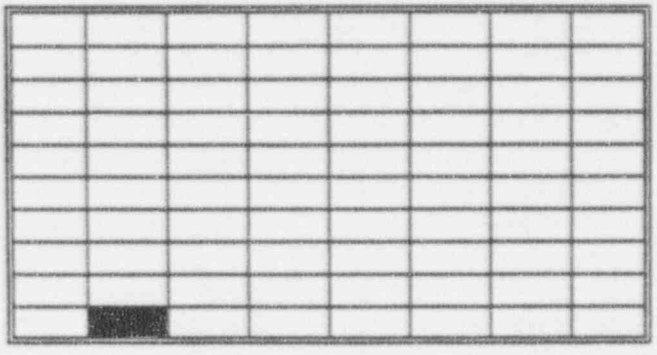
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDERVOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-67

SENSING ELEMENT: 27Y-1/33RB 27Z/33RB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL
TRANSFORMER
TROUBLE

EVENT POINT 0662

INDICATED CONDITION:

- "A" 480V TURBINE AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

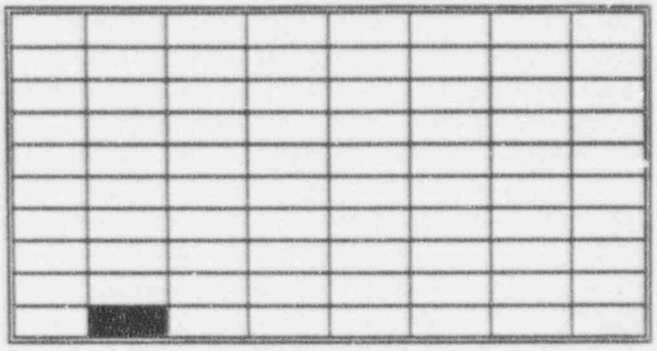
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES. DRAWING 208-040 MT-68

SENSING ELEMENT: 27Y-1/33TA 27Z/33TA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0664

INDICATED CONDITION:

- "B" 480V TURBINE AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

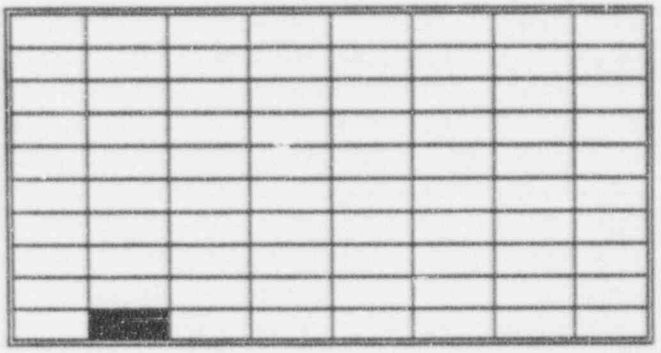
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-68

SENSING ELEMENT: 27Y-1/33TB 27Z/33TB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL
TRANSFORMER
TROUBLE

EVENT POINT 0666

INDICATED CONDITION:

- "A" 480V INTAKE AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

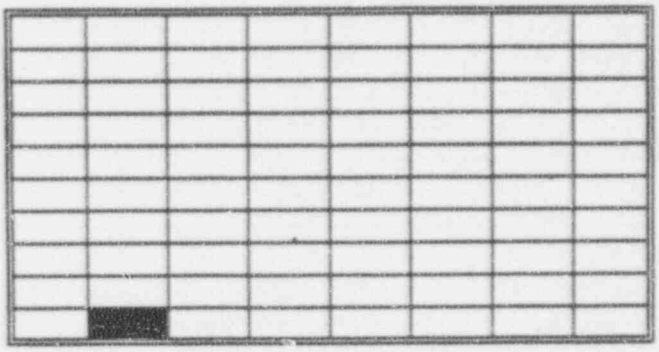
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-69

SENSING ELEMENT: 27Y-1/33IA 27Z/33IA RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0668

INDICATED CONDITION:

- "B" 480V INTAKE AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

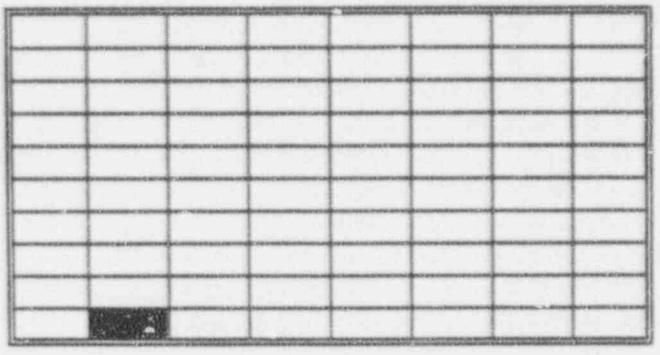
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-69

SENSING ELEMENT: 27Y-1/33IB 27Z/33IB RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL
TRANSFORMER
TROUBLE

EVENT POINT 0670

INDICATED CONDITION:

- 480V PLANT AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

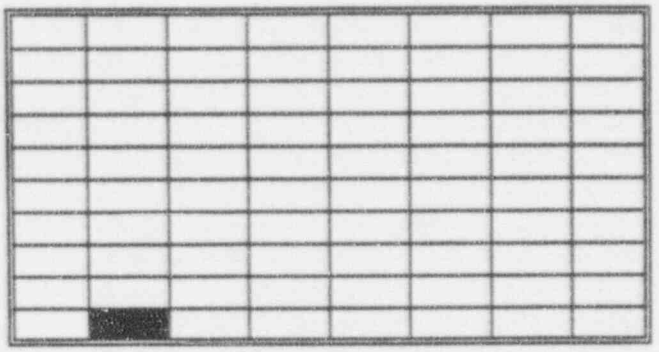
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-70

SENSING ELEMENT: 27Y-1/33P 27Z/33P RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 0672

INDICATED CONDITION:

- 480V HEATING AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

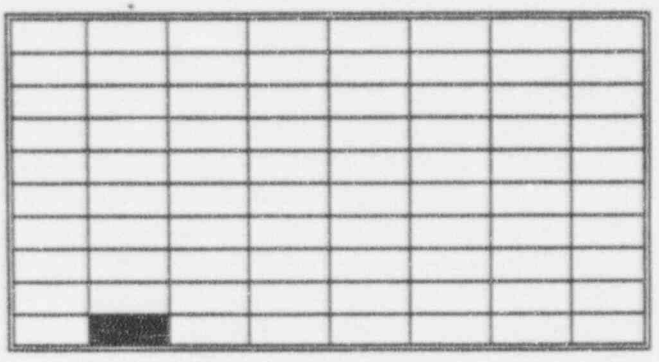
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-70

SENSING ELEMENT: 27Y-1/33H 27Z/33H RELAYS

SSF ANNUNCIATOR RESPONSE	SSF-A2-2-10	Q-2-10



POTENTIAL TRANSFORMER TROUBLE

EVENT POINT 1991

INDICATED CONDITION:

- 4160V REACTOR AUX BUS UNDERVOLTAGE ON "1 OUT OF 3" LOGIC OR A SINGLE POTENTIAL TRANSFORMER CIRCUIT HAS FAILED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- OBSERVE BUS VOLTAGE WITHIN NORMAL VALUES

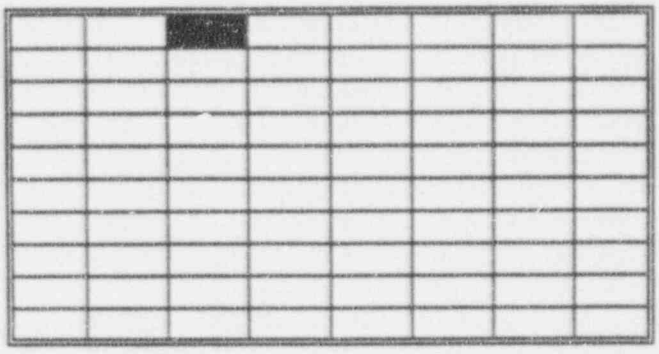
DISCUSSION:

THIS ALARM MAY BE ONE OF THE FIRST ALARMS TO ACTUATE DURING A BUS UNDER-VOLTAGE CONDITION. POTENTIAL TRANSFORMER TROUBLE USES A "1 OUT OF 3" UNDERVOLTAGE LOGIC. IF MORE THAN 1 UNDERVOLTAGE RELAY OR POTENTIAL TRANSFORMER IS INVOLVED THEN THE ALARM UPGRADES TO BUS UNDERVOLTAGE AND THE POTENTIAL TRANSFORMER ALARM IS DISABLED.

REFERENCES: DRAWING 208-040 MT-136

SENSING ELEMENT: 32RA

SSF ANNUNCIATOR RESPONSE	SSF-A2-3-01	Q-3-01



**DIESEL GEN A
OVER
3250 KW**

EVENT POINT 1590

INDICATED CONDITION:

- DIESEL GENERATOR "A" OVER 3250 KW.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR "A" KW INDICATION.
- DIESEL GENERATOR "A" "EDG-3A ELAPSED TIME ABOVE 3250 KW" TIMER IS OPERATING.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770.
- REDUCE LOAD IF SURVEILLANCE TESTING.

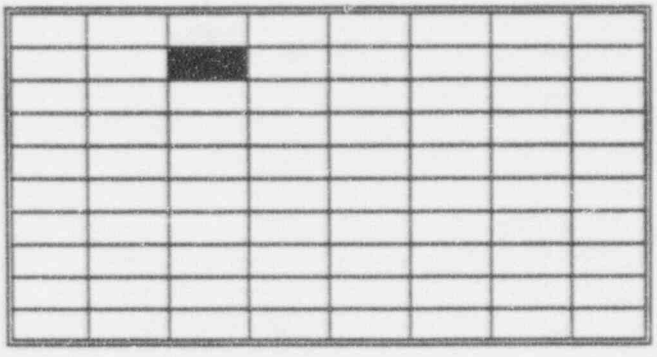
DISCUSSION:

THIS ALARM IS INSTANTANEOUS WHEN DIESEL LOAD EXCEEDS 3250 KW. THE 24 AND 29 MINUTE TIMERS ARE ALSO ACTUATED BUT WILL RESET IF THE ALARM CONDITION CLEARS.

REFERENCES: DRAWING 208-027 EG-22

SENSING ELEMENT: 62BX

SSF ANNUNCIATOR RESPONSE	SSF-A2-3-02	Q-3-02



DIESEL GEN A
OVER 3250 KW
FOR 24/29 MIN

EVENT POINT 1591

INDICATED CONDITION:

- DIESEL GENERATOR "A" OVER 3250 KW FOR > 29 MINUTES.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR "A" KW INDICATION.
- DIESEL GENERATOR "A" "EDG-3A ELAPSED TIME ABOVE 3250 KW" TIMER IS OPERATING.

OPERATOR ACTIONS FOR A VALID ALARM:

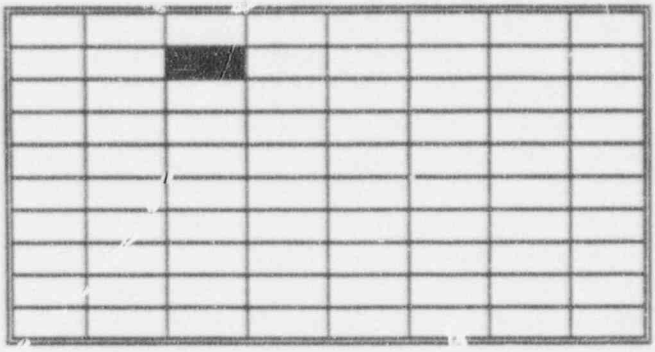
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-627 CG-22

SENSING ELEMENT: TIMER (29 MINUTE) EGEN-1

SSF ANNUNCIATOR RESPONSE	SSF-A2-3-02	Q-3-02



**DIESEL GEN A
OVER 3250 KW
FOR 24/29 MIN**

EVENT POINT 1687

INDICATED CONDITION:

- DIESEL GENERATOR "A" OVER 3250 KW FOR > 24 MINUTES.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR "A" KW INDICATION.
- DIESEL GENERATOR "A" "EDG-3A ELAPSED TIME ABOVE 3250 KW" TIMER IS OPERATING.

OPERATOR ACTIONS FOR A VALID ALARM:

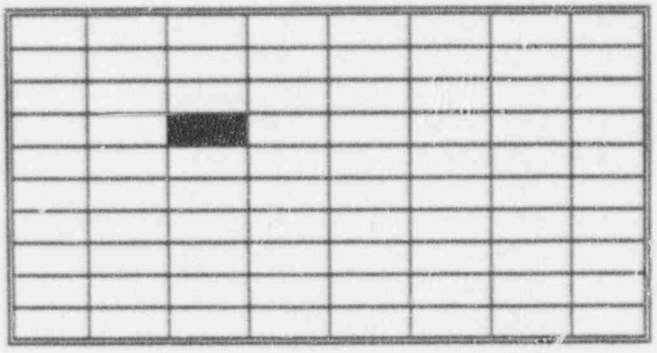
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-027 EG-22

SENSING ELEMENT: TIMER (24 MINUTE) EGEN-1

SSF ANNUNCIATOR RESPONSE	SSF-A2-3-04	Q-3-04



4KV ES A UNDERVOLTAGE TRIP BLOCKED

EVENT POINT 0823

INDICATED CONDITION:

- "A" ES 4160V BUS UNDERVOLTAGE PROTECTION DISABLED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- MONITOR "A" ES BUS VOLTAGES DURING UNDERVOLTAGE RELAY TESTING.

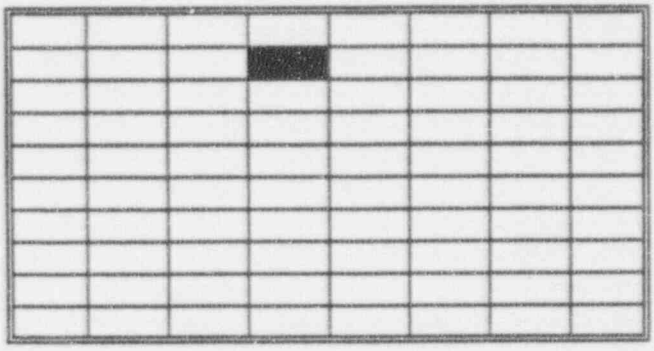
DISCUSSION:

THIS ALARM WILL OCCUR WHEN TESTING THE BUS UNDERVOLTAGE RELAYS. NO UNDERVOLTAGE PROTECTION IS AVAILABLE DURING TESTING.

REFERENCES: DRAWING 208-040 MT-65B

SENSING ELEMENT: TBS1, TBS2

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-02	Q-4-02



4KV ES BUS DEGRADED VOLT TRIP

EVENT POINT 1747

INDICATED CONDITION:

- o "A" ES 4160V BUS VOLTAGE **<3952 VOLTS** FOR **>5 SECONDS**.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o "A" ES 4160V BUS VOLTAGE METER INDICATING < 3952 VAC

OPERATOR ACTIONS FOR A VALID ALARM:

- o REFER TO AP-770.

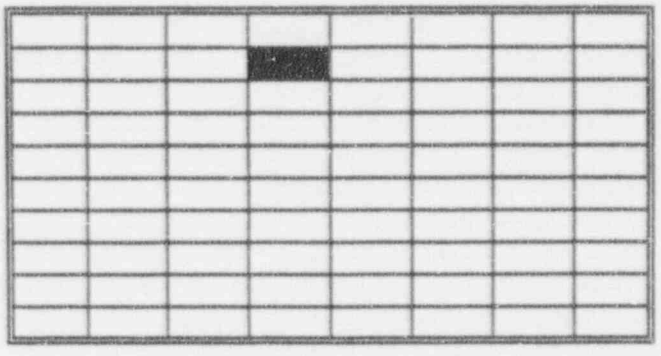
DISCUSSION:

THIS ALARM WILL OCCUR WHEN ANY OF THREE VOLTAGE SENSE RELAYS DETECT LESS THAN 3952 VOLTS FOR GREATER THAN 5 SECONDS. A DIESEL GENERATOR START SIGNAL IS INITIATED IF ALL THREE VOLTAGE RELAYS SENSE THIS CONDITION.

REFERENCES: DRAWING 208 840 MT-131

SENSING ELEMENT: 27B-A/32EA, 27B-B/32EA, 27B-C/32EA

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-02	Q-4-02



4KV ES BUS DEGRADED VOLT TRIP

EVENT POINT 1818

INDICATED CONDITION:

- "B" ES 4160V BUS VOLTAGE **<3952 VOLTS** FOR **>5 SECONDS**.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- "B" ES 4160V BUS VOLTAGE METER INDICATING < 3952 VAC

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770.

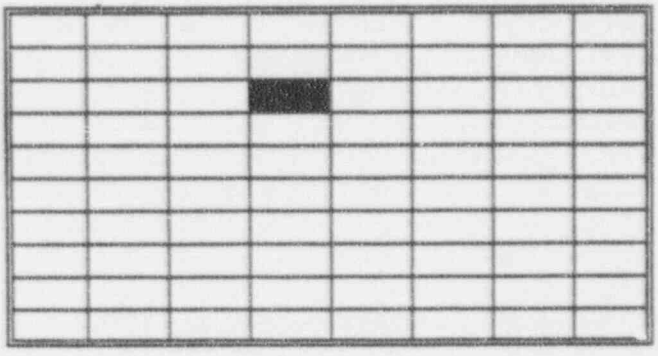
DISCUSSION:

THIS ALARM WILL OCCUR WHEN ANY OF THREE VOLTAGE SENSE RELAYS DETECT LESS THAN 3952 VOLTS FOR GREATER THAN 5 SECONDS. A DIESEL GENERATOR START SIGNAL IS INITIATED IF ALL THREE VOLTAGE RELAYS SENSE THIS CONDITION.

REFERENCES: DRAWING 208-040 MT-13[illegible]

SENSING ELEMENT: 27B-A/32EB, 27B-B/32EB, 27B-C/32EB

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-03	Q-4-03



CROSS-TIE
BLOCKED
LOSS OF DC

EVENT POINT 1184

INDICATED CONDITION:

- "A" ES 4160V BUS CROSS TIE LOCKOUT RELAY LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

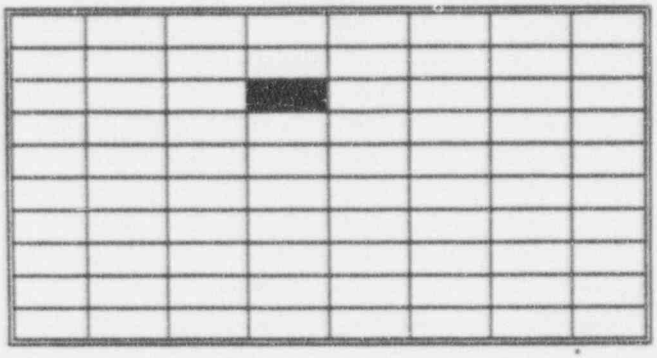
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #6. FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-129, MT-127

SENSING ELEMENT: 27C-1A

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-03	Q-4-03



CROSS-TIE
BLOCKED
LOSS OF DC

EVENT POINT 1185

INDICATED CONDITION:

- "A" ES 4160V BUS CROSS TIE CIRCUIT LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

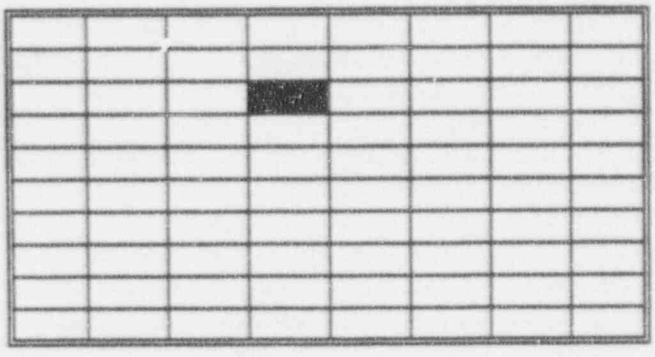
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #6. ADDITIONAL FUSES BEHIND THE CONTROL BOARD ARE ALSO INVOLVED.

REFERENCES: DRAWING 208-040 MT-129, MT-127

SENSING ELEMENT: 27C-2A

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-03	Q-4-03



CROSS-TIE
BLOCKED
LOSS OF DC

EVENT POINT 1188

INDICATED CONDITION:

- "B" ES 4160V BUS CROSS TIE LOCKOUT RELAY LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

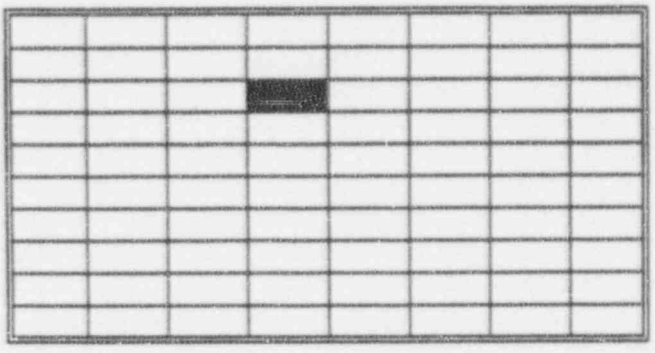
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #6. FUSES ARE LOCATED INSIDE THE MCB FOR THIS CIRCUIT.

REFERENCES: DRAWING 208-040 MT-129, MT-128

SENSING ELEMENT: 27C-1B

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-03	Q-4-03



CROSS-TIE
BLOCKED
LOSS OF DC

EVENT POINT 1189

INDICATED CONDITION:

- "B" ES 4160V BUS CROSS TIE CIRCUIT LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

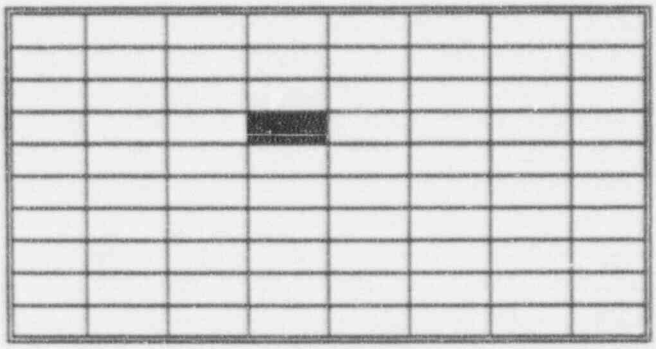
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #6. ADDITIONAL FUSES BEHIND THE CONTROL BOARD ARE ALSO INVOLVED.

REFERENCES: DRAWING 208-040 MT-129, MT-128

SENSING ELEMENT: 27C-2B

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0555

INDICATED CONDITION:

- "A" ES 4160V BUS SUPPLY BREAKER 3205 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3205 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

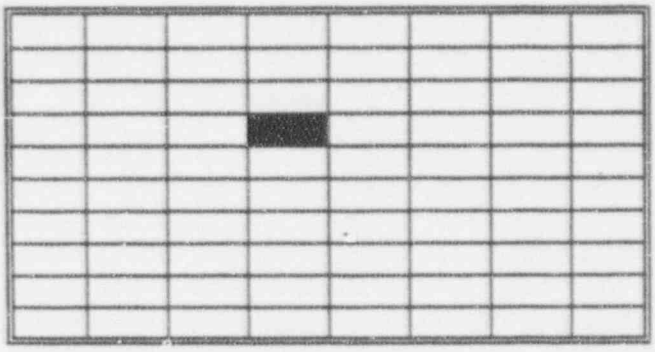
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #10.

REFERENCES: DRAWING 208-040 MT-9

SENSING ELEMENT: 27C/3205

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0559

INDICATED CONDITION:

- "B" ES 4160V BUS SUPPLY BREAKER 3206 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3206 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

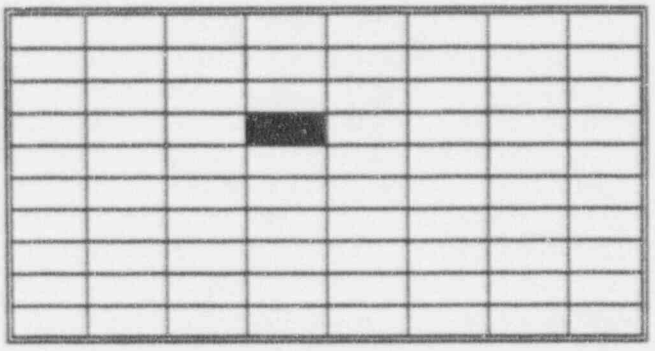
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #10.

REFERENCES: DRAWING 208-040 MT-10

SENSING ELEMENT: 27C/3206

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0563

INDICATED CONDITION:

- "A" ES 4160V BUS SUPPLY BREAKER 3207 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3207 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

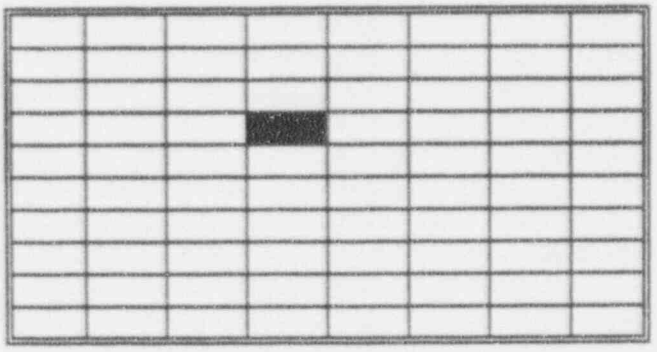
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #10.

REFERENCES: DRAWING 208-040 MT-11

SENSING ELEMENT: 27C/3207

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0566

INDICATED CONDITION:

- "B" ES 4160V BUS SUPPLY BREAKER 3208 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3208 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

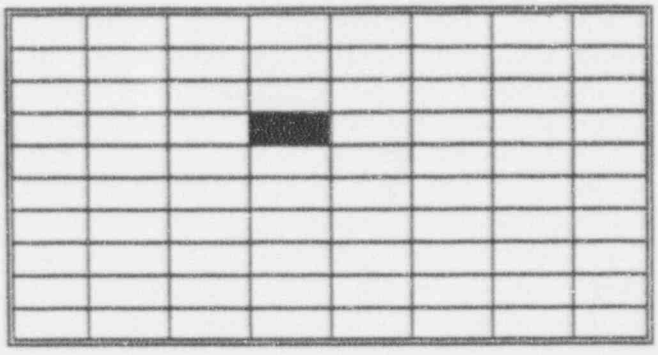
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DFDP-5B FUSE #10.

REFERENCES: DRAWING 208-040 MT-12

SENSING ELEMENT: 27C/3208

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0569

INDICATED CONDITION:

- "A" ES 4160V BUS SUPPLY BREAKER 3209 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3209 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

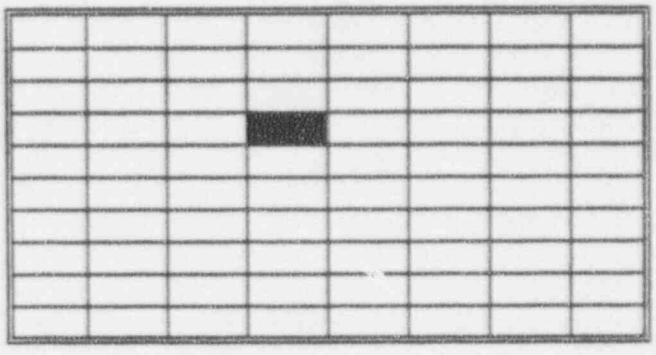
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #10.

REFERENCES: DRAWING 208-040 MT-13

SENSING ELEMENT: 27C/3209

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0572

INDICATED CONDITION:

- "B" ES 4160V BUS SUPPLY BREAKER 3210 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3210 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

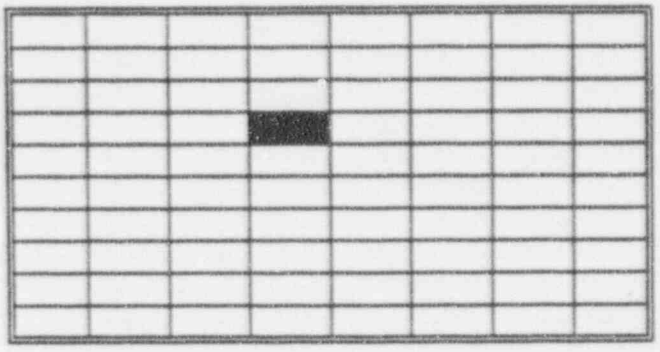
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #10.

REFERENCES: DRAWING 208-040 MT-14

SENSING ELEMENT: 27C/3210

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0575

INDICATED CONDITION:

- "A" ES 4160V BUS SUPPLY BREAKER 3211 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3211 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

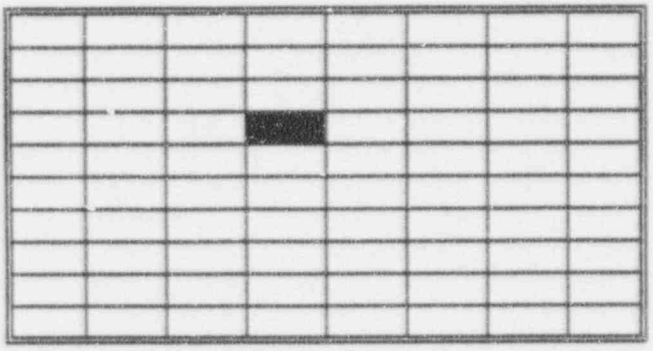
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #10.

REFERENCES: DRAWING 208-040 MT-15

SENSING ELEMENT: 27C/3211

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0578

INDICATED CONDITION:

- "B" ES 4160V BUS SUPPLY BREAKER 3212 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3212 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

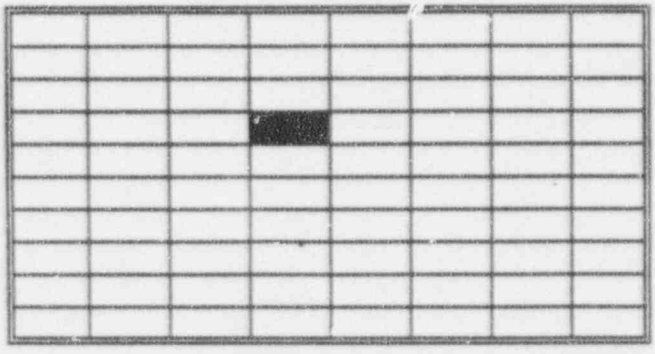
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #10.

REFERENCES: DRAWING 208-040 MT-16

SENSING ELEMENT: 27C/3212

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0588

INDICATED CONDITION:

- "B" ES 480V BUS TRANSFORMER SUPPLY BREAKER 3220 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3220 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

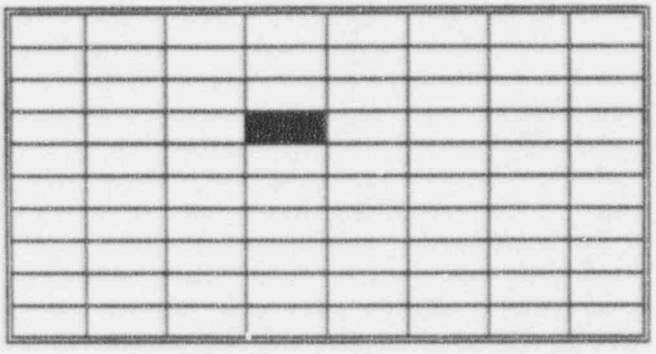
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #10.

REFERENCES: DRAWING 208-040 MT-24

SENSING ELEMENT: 27C/3220

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0590

INDICATED CONDITION:

- "A" ES 480V BUS TRANSFORMER SUPPLY BREAKER 3221 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3221 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

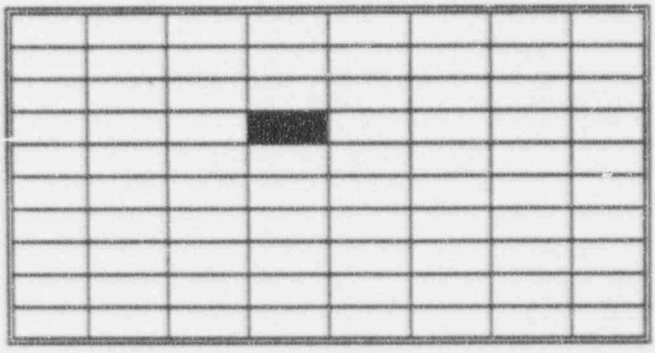
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #10.

REFERENCES: DRAWING 208-040 MT-25

SENSING ELEMENT: 27C/3221

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0592

INDICATED CONDITION:

- 480V PLANT AUX BUS TRANSFORMER SUPPLY BREAKER 3222 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3222 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

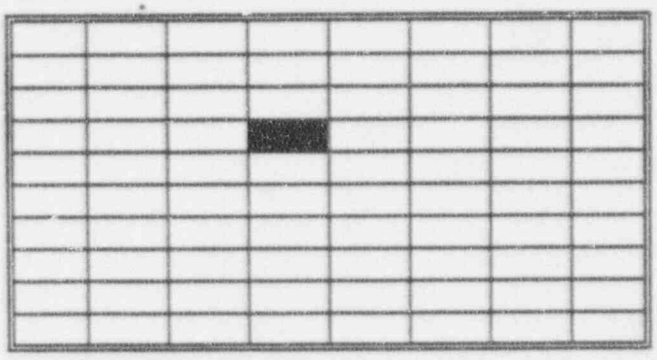
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #10.

REFERENCES: DRAWING 208-040 MT-26

SENSING ELEMENT: 27C/3222

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0609

INDICATED CONDITION:

- "B" ES 480V BUS SUPPLY BREAKER 3310 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3310 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

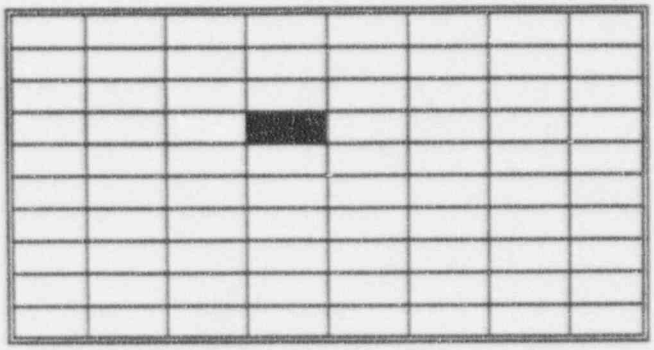
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #9.

REFERENCES: DRAWING 208-040 MT-34

SENSING ELEMENT: 27C/3310

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0612

INDICATED CONDITION:

- "A" ES 480V BUS SUPPLY BREAKER 3311 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3311 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

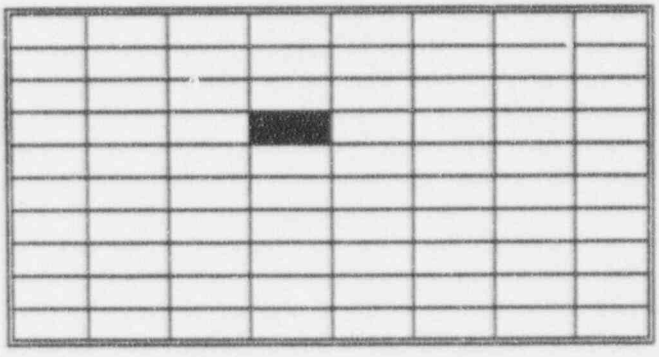
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #9.

REFERENCES: DRAWING 208-040 MT-35

SENSING ELEMENT: 27C/3311

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0616

INDICATED CONDITION:

- "B" ES 480V BUS CROSS-TIE BREAKER 3390 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3390 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

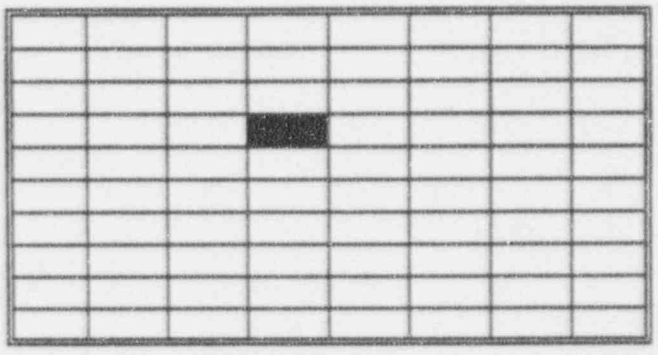
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #9.

REFERENCES: DRAWING 208-040 MT-37

SENSING ELEMENT: 27C/3390

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0618

INDICATED CONDITION:

- "A" ES 480V BUS CROSS-TIE BREAKER 3391 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NO INDICATING LIGHTS ARE ON, LOCATED ON THE BREAKER 3391 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

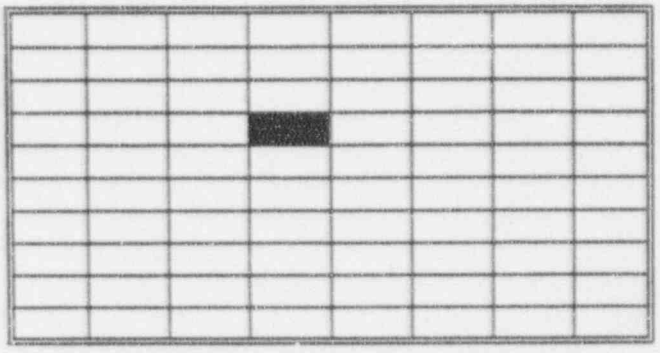
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #9.

REFERENCES: DRAWING 208-040 MT-38

SENSING ELEMENT: 27C/3391

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0673

INDICATED CONDITION:

- 480V ES MCC 3B1 SUPPLY BREAKER 3340 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

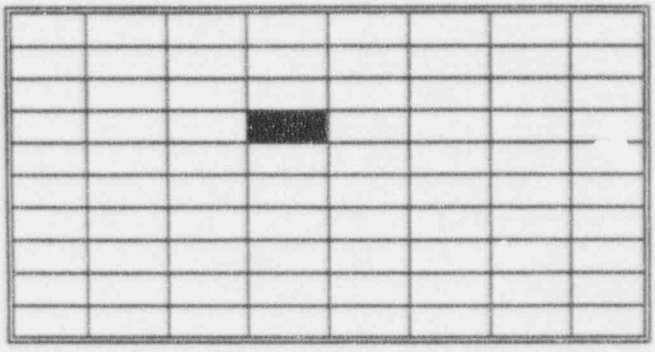
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #9.

REFERENCES: DRAWING 208-040 MT-47

SENSING ELEMENT: 27C/3340

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0674

INDICATED CONDITION:

- 480V ES MCC 3A1 SUPPLY BREAKER 3341 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

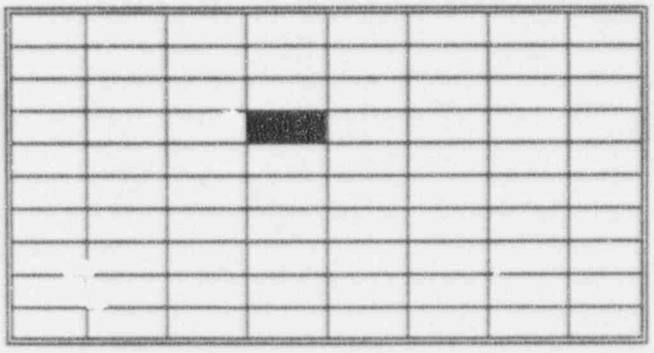
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #3.

REFERENCES: DRAWING 208-040 MT-54

SENSING ELEMENT: 27C/3341

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0677

INDICATED CONDITION:

- 480V ES MCC 3AB CROSS-TIE BREAKER 3361 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

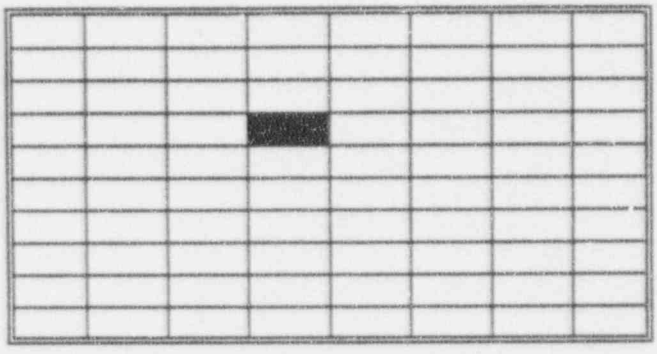
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #9.

REFERENCES: DRAWING 208-040 MT-89

SENSING ELEMENT: 27C/3361

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0679

INDICATED CONDITION:

- 480V ES MCC 3AB CROSS-TIE BREAKER 3360 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

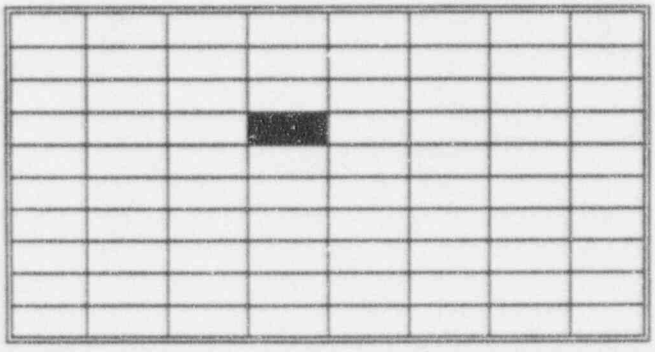
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #9.

REFERENCES: DRAWING 208-040 MT-88

SENSING ELEMENT: 27C/3360

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0681

INDICATED CONDITION:

- 480V ES MCC 3A2 SUPPLY BREAKER 3351 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

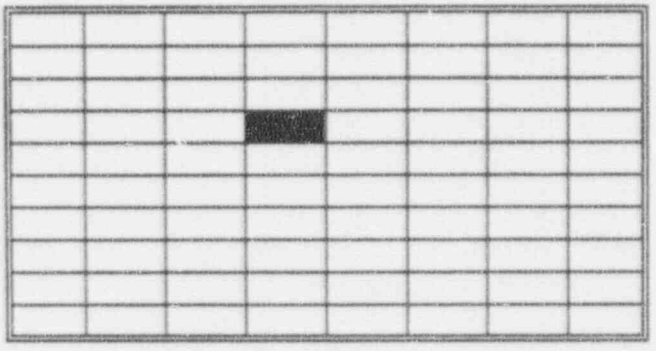
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #9.

REFERENCES: DRAWING 208-040 MT-46

SENSING ELEMENT: 27C/3351

SSF ANNUNCIATOR RESPONSE	CSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0765

INDICATED CONDITION:

- 480V ES MCC 3B3 SUPPLY BREAKER 3330 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

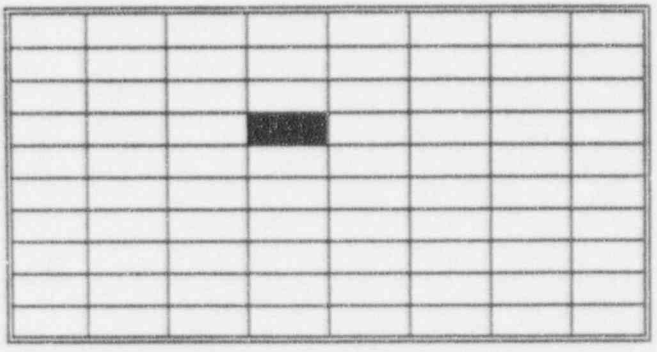
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #9.

REFERENCES: DRAWING 208-040 MT-116

SENSING ELEMENT: 27C/3330

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 0766

INDICATED CONDITION:

- 480V ES MCC 3A3 SUPPLY BREAKER 3331 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

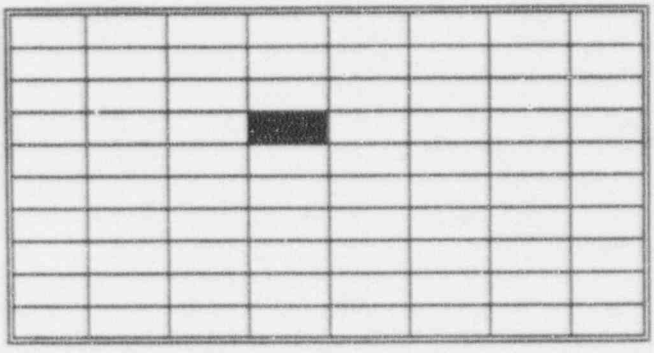
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5A FUSE #9.

REFERENCES: DRAWING 208-040 MT-113

SENSING ELEMENT: 27C/333'

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-04	Q-4-04



ES BKR
DC POWER
LOSS

EVENT POINT 1152

INDICATED CONDITION:

- 480V ES MCC 3B2 SUPPLY BREAKER 3350 LOSS OF DC CONTROL POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE CAUSE OF LOSS OF DC CONTROL POWER.

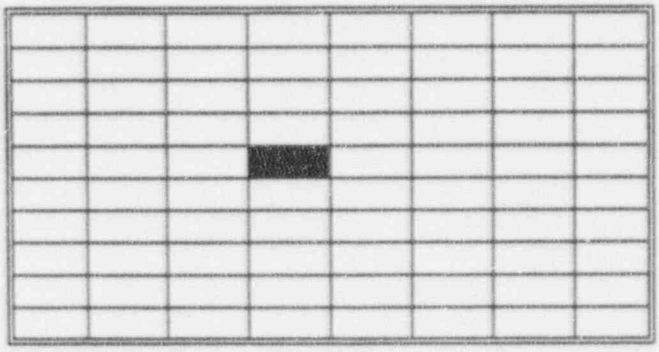
DISCUSSION:

DC CONTROL POWER IS SUPPLIED FROM DPDP-5B FUSE #9.

REFERENCES: DRAWING 208-040 MT-119

SENSING ELEMENT: 27C/3350

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-05	Q-4-05



ES
BREAKER
WITHDRAWN

EVENT POINT 0573

INDICATED CONDITION:

- UNIT #3 DUMMY BREAKER WITHDRAWN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT.

DISCUSSION:

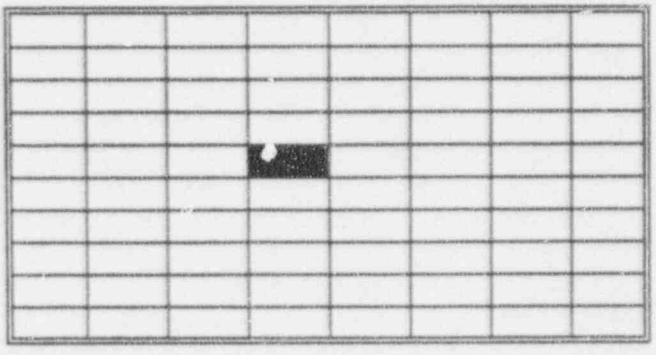
THIS BREAKER IS LOCATED IN THE "B" ES 4160V BUS SWITCHGEAR. THIS IS AN EXPECTED ALARM WHEN THE BREAKER IS IN THE TEST POSITION. TO RACK THIS BREAKER IN/OUT THE STARTUP TRANSFORMER AND ES 4160VAC BUSSES MUST BE DEENERGIZED.

THE DUMMY BREAKER HAS NO AUTOMATIC TRIP FUNCTIONS, IT ACTS TO CONNECT THE STARTUP TRANSFORMER FEED TO BREAKERS 3205 AND 3206 FOR THE ES 4160VAC BUSSES.

REFERENCES: DRAWING 208-040 MT-90

SENSING ELEMENT: 52H/B CONTACT FOR DUMMY BREAKER.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-05	Q-4-05



ES
BREAKER
WITHDRAWN

EVENT POINT 0698

INDICATED CONDITION:

- "B" ES 480V BUS TRANSFORMER SUPPLY BREAKER 3220 NOT RACKED IN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NEITHER RED NOR GREEN LIGHTS ARE ON, LOCATED ON BREAKER 3220 CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT.

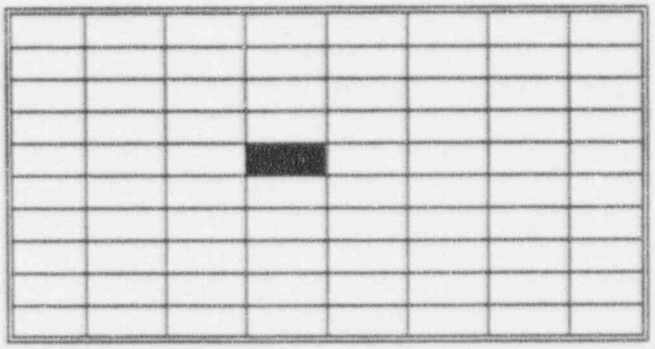
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN THE BREAKER IS IN THE TEST POSITION.

REFERENCES: DRAWING 208-040 MT-24

SENSING ELEMENT: 52H/B CONTACT FOR BREAKER 3220.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-05	Q-4-05



ES
BREAKER
WITHDRAWN

EVENT POINT 0699

INDICATED CONDITION:

- "A" ES 480V BUS TRANSFORMER SUPPLY BREAKER 3221 NOT RACKED IN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NEITHER RED NOR GREEN LIGHTS ARE ON, LOCATED ON BREAKER 3221 CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT.

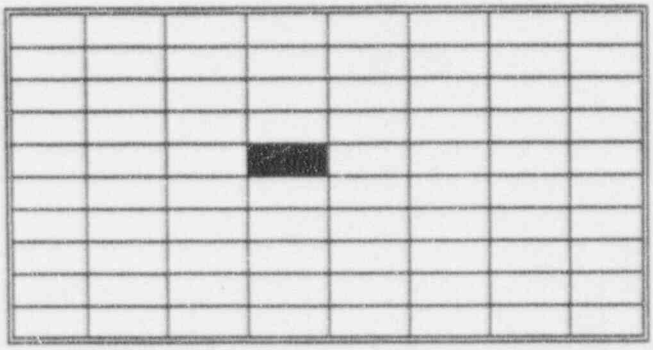
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN THE BREAKER IS IN THE TEST POSITION.

REFERENCES: DRAWING 208-040 MT-25

SENSING ELEMENT: 52H/B CONTACT FOR BREAKER 3221.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-05	Q-4-05



ES
BREAKER
WITHDRAWN

EVENT POINT 0707

INDICATED CONDITION:

- "B" ES 480V BUS SUPPLY BREAKER 3310 NOT RACKED IN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NEITHER RED NOR GREEN LIGHTS ARE ON, LOCATED ON BREAKER 3310 CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT.

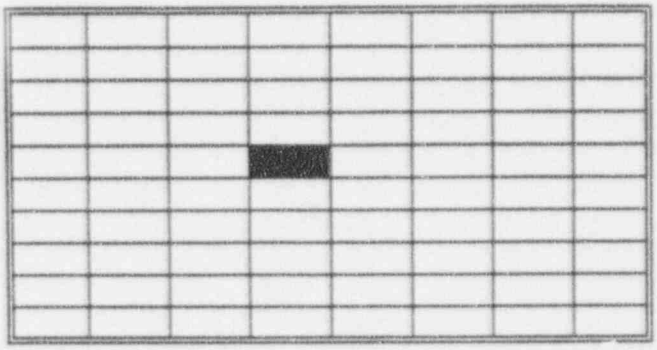
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN THE BREAKER IS IN THE TEST POSITION.

REFERENCES: DRAWING 208-040 MT-34

SENSING ELEMENT: 52H/B CONTACT FOR BREAKER 3310.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-05	0-4-05



ES
BREAKER
WITHDRAWN

EVENT POINT 0709

INDICATED CONDITION:

- "A" ES 480V BUS SUPPLY BREAKER 3311 NOT RACKED IN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- NEITHER RED NOR GREEN LIGHTS ARE ON, LOCATED ON BREAKER 3311 CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- INVESTIGATE THE CAUSE FOR BREAKER BEING RACKED OUT.

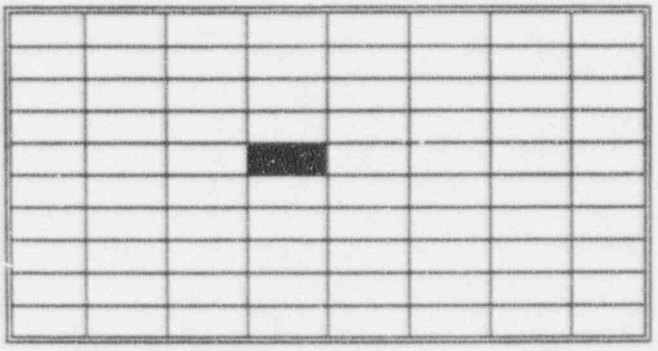
DISCUSSION:

THIS IS AN EXPECTED ALARM WHEN THE BREAKER IS IN THE TEST POSITION.

REFERENCES: DRAWING 208-040 MT-35

SENSING ELEMENT: 52H/B CONTACT FOR BREAKER 3311.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-05	Q-4-05



ES
BREAKER
WITHDRAWN

EVENT POINT 0712

INDICATED CONDITION:

- 480V ES MCC 3AB CROSS-TIE BREAKERS 3360 AND 3361 NOT RACKED IN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

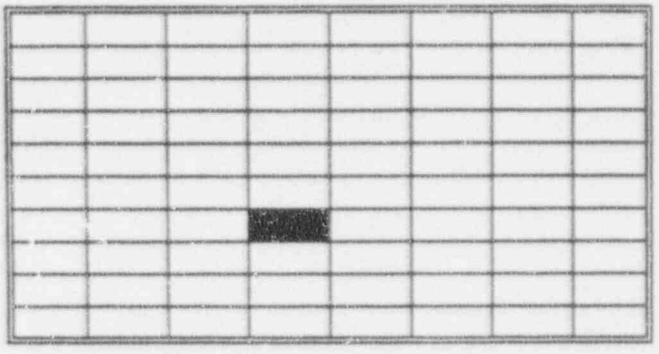
- INVESTIGATE THE CAUSE FOR BOTH BREAKERS BEING RACKED OUT.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-88, MT-89

SENSING ELEMENT: 52H/B CONTACTS FOR BREAKERS 3360 AND 3361.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-07	Q-4-07



ES
MCC 3AB
DEAD

EVENT POINT 0697

INDICATED CONDITION:

- 480V ES MCC 3AB LOSS OF VOLTAGE AS SENSED BY THE AR RELAY.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

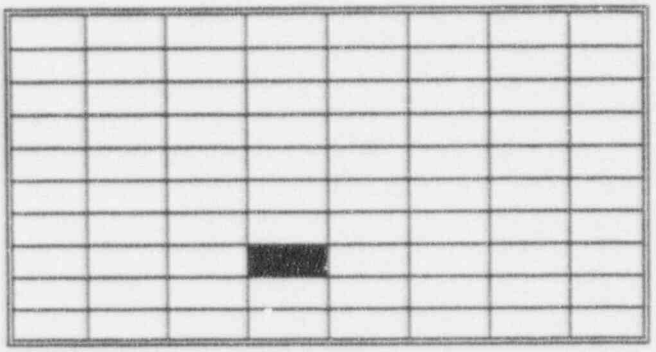
- INVESTIGATE CAUSE FOR MCC 3AB LOSS OF VOLTAGE.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-125

SENSING ELEMENT: AR RELAY.

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-08	Q-4-08



ES MCC 3AB
BREAKER
OPEN

EVENT POINT 0678

INDICATED CONDITION:

- 480V ES MCC 3AB CROSS-TIE BREAKER 3361 OPEN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

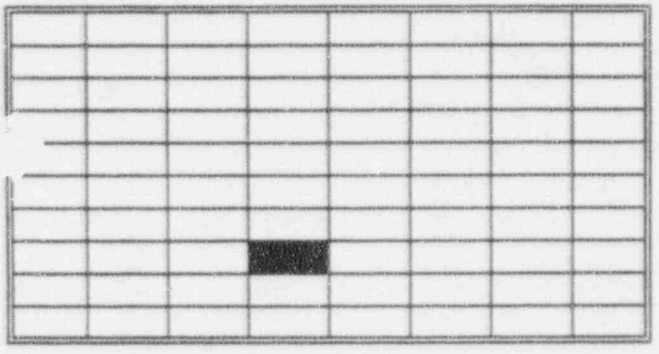
- INVESTIGATE CAUSE FOR MCC 3AB BREAKER 3361 OPEN.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-89

SENSING ELEMENT: R/B SWITCHGEAR CONTACT FOR BREAKER 3361

SSF ANNUNCIATOR RESPONSE	SSF-A2-4-08	Q-4-08



ES MCC 3AB
BREAKER
OPEN

EVENT POINT 0680

INDICATED CONDITION:

- 480V ES MCC 3AB CROSS-TIE BREAKER 3360 OPEN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

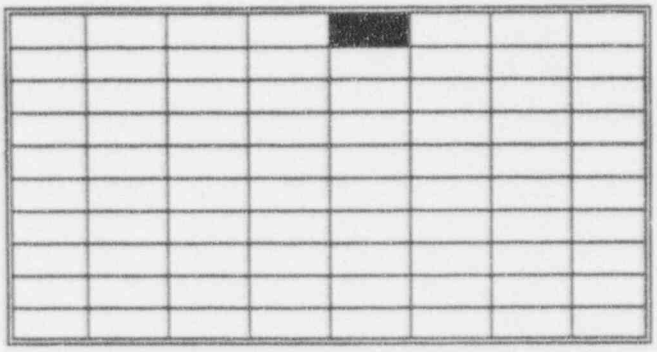
- INVESTIGATE CAUSE FOR MCC 3AB BREAKER 3360 OPEN.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-88

SENSING ELEMENT: R/B SWITCHGEAR CONTACT FOR BREAKER 3360

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-01	Q-5-01



4KV
ES BUS B
DEAD

EVENT POINT 0651

INDICATED CONDITION:

- "B" ES 4160V BUS UNDERVOLTAGE

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- 4160V ES BUS 3B VOLTAGE INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770.

DISCUSSION:

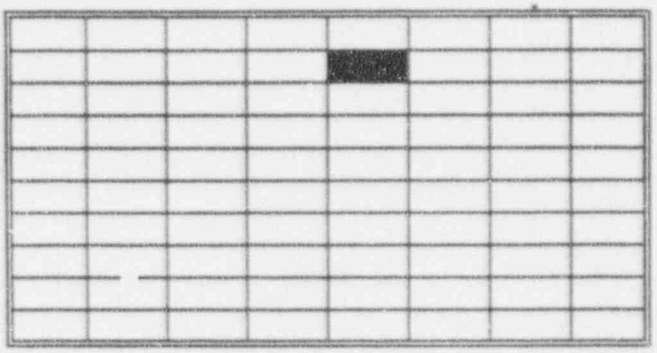
THIS ALARM IS THE RESULT OF A 2 OUT OF 3 UNDERVOLTAGE (FLUR) RELAY LOGIC.

THE FLUR RELAYS ARE INTENDED TO PROVIDE ES 4160VAC UNDERVOLTAGE RESPONSE WHEN VOLTAGE DROPS INSTANTLY TO ZERO. THE SLUR RELAY WILL PROVIDE UNDERVOLTAGE RESPONSE WHEN THE VOLTAGE DROPS GRADUALLY BELOW THE SLUR SETPOINT.

REFERENCES: DRAWING 208-040 MT-65

SENSING ELEMENT: 27Y-3/32EA RELAY

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-02	Q-5-02



DIESEL GEN B
BREAKER
TRIP

EVENT POINT 0571

INDICATED CONDITION:

- "B" ES 4160V BUS DIESEL OUTPUT BREAKER 3210 TRIPPED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON WITH A RED FLAG ON THE BREAKER 3210 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

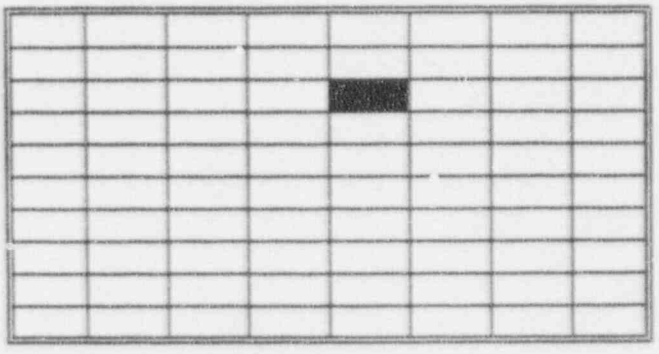
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-14

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

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-03	Q-5-03



DIESEL GEN B
BREAKER
CLOSED

EVENT POINT 1186

INDICATED CONDITION:

- "B" ES 4160V BUS DIESEL OUTPUT BREAKER 3210 IS CLOSED, WITH EITHER AN ES ACTUATION SIGNAL OR BUS UNDERVOLTAGE SIGNAL PRESENT

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED LIGHT IS ON WITH A GREEN FLAG ON BREAKER 3210 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

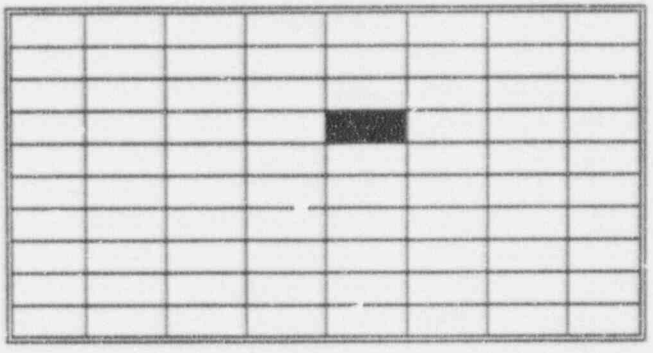
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-128, MT-129

SENSING ELEMENT: 86B/ESB

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-04	0-5-04



4KV ES B
CROSS-TIE
BLOCKED

EVENT POINT 1187

INDICATED CONDITION:

- BREAKERS 3209 AND 3210 CLOSED WITH **EITHER** 3205, 3207, OR 3211 CLOSED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GEN "A" CROSS-TIE LIGHT EXTINGUISHED.
- IF 3205 CLOSED THEN, BLOCK CLOSING ACTUATED 3206 LIGHT IS ON.
- IF 3207 CLOSED THEN, BLOCK CLOSING ACTUATED 3208 LIGHT IS ON.
- IF 3211 CLOSED THEN, BLOCK CLOSING ACTUATED 3212 LIGHT IS ON.

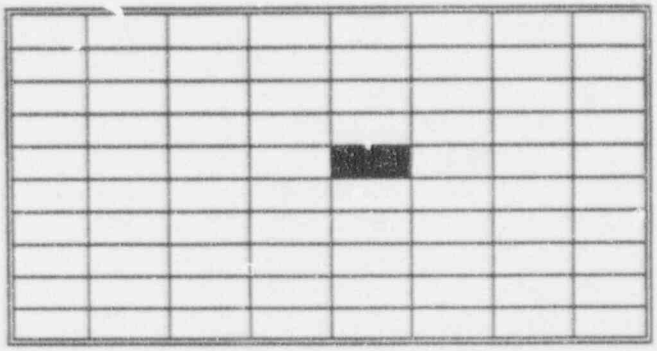
OPERATOR ACTIONS FOR A VALID ALARM:

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-127, MT-129

SENSING ELEMENT: 3-52-2, 3-52S CONTACTS

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-05	Q-5-05



DIESEL GEN B
VOLTAGE ADJ
IN CONTROL RM

EVENT POINT 1178

INDICATED CONDITION:

- DIESEL GENERATOR "B" VOLTAGE ADJUST SELECTED TO THE CONTROL ROOM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR B "EXC VOLT ADJ SELECT" SWITCH SELECTED TO "CONT RM" POSITION.

OPERATOR ACTIONS FOR A VALID ALARM:

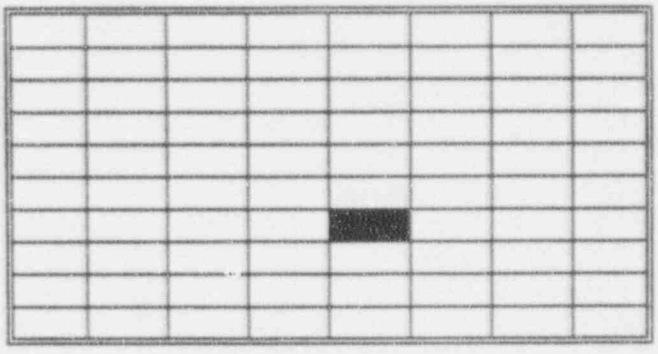
DISCUSSION:

THIS SWITCH IS NORMALLY SELECTED TO THE "DG RM" POSITION.

REFERENCES: DRAWING 208-027 EG-18

SENSING ELEMENT: SS/O,CB/SSF CONTACT

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-07	Q-5-07



480V
ES BUS B
DEAD

EVENT POINT 0655

INDICATED CONDITION:

- "B" 480V BUS UNDERVOLTAGE.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- 480V ES BUS "B" VOLTAGE INDICATES LESS THAN NORMAL.

OPERATOR ACTIONS FOR A VALID ALARM:

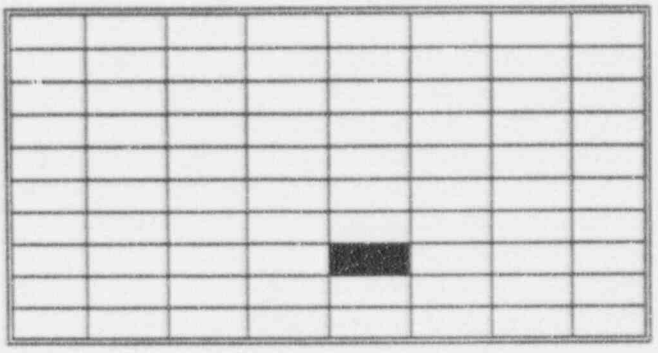
- REFER TO AP-770

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-66

SENSING ELEMENT: 27Y-1/33EB

SSF ANNUNCIATOR RESPONSE	SSF-A2-5-08	Q-5-08



480V
ES BUS B
UV LOCKOUT ACT

EVENT POINT 0722

INDICATED CONDITION:

- "B" ES 480V BUS UNDERVOLTAGE LOCK OUT RELAY ACTUATED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- 4160V ES BUS B VOLTAGE INDICATES LESS THAN NORMAL.
- 480V ES BUS B VOLTAGE INDICATES LESS THAN NORMAL.
- BREAKER 3210 INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770

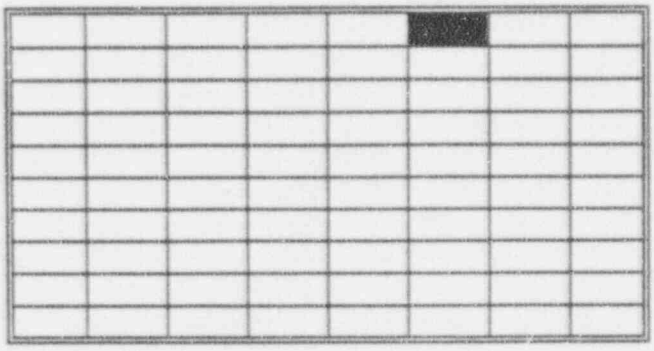
DISCUSSION:

THE 480V ES UNDERVOLTAGE LOCK OUT RELAY IS ACTUATED WHEN, EITHER THE 'B' DIESEL OUTPUT BREAKER IS CLOSED, OR 4160V ES BUS A UNDERVOLTAGE OCCURS WITH AN ES ACTUATION.

REFERENCES: DRAWING 208-040 MT-79

SENSING ELEMENT: 86/27ESB

SSF ANNUNCIATOR RESPONSE	SSF-A2-6-01	Q-6-01



DIESEL GEN B
OVER
3250 KW

EVENT POINT 1996

INDICATED CONDITION:

- DIESEL GENERATOR "B" OVER 3250 KW.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR "B" KW INDICATION.
- DIESEL GENERATOR "B" "EDG-3B ELAPSED TIME ABOVE 3250 KW" TIMER OPERATING.

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770.
- REDUCE LOAD IF SURVEILLANCE TESTING.

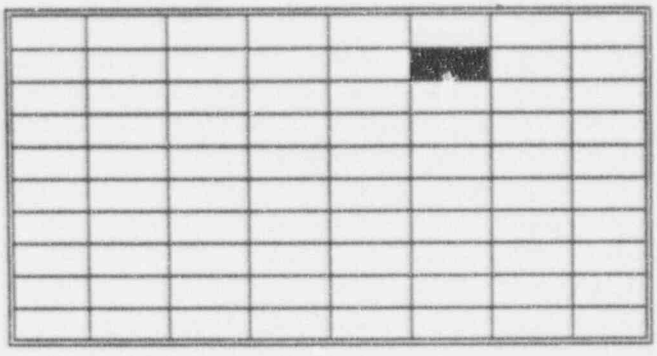
DISCUSSION:

THIS ALARM IS INSTANTANEOUS WHEN DIESEL LOAD EXCEEDS 3250 KW. THE 24 AND 29 MINUTE TIMERS ARE ALSO ACTUATED BUT WILL RESET IF THE ALARM CONDITION CLEARS.

REFERENCES: DRAWING 208-027 EG-21

SENSING ELEMENT: 62BX

SSF ANNUNCIATOR RESPONSE	SSF-A2-6-02	Q-6-02



DIESEL GEN B
OVER 3250 KW
FOR 24/29 MIN

EVENT POINT 1997

INDICATED CONDITION:

- DIESEL GENERATOR "B" OVER 3250 KW FOR > 29 MINUTES.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR "B" KW INDICATION.
- DIESEL GENERATOR "B" "EDG-3B ELAPSED TIME ABOVE 3250 KW" TIMER OPERATING.

OPERATOR ACTIONS FOR A VALID ALARM:

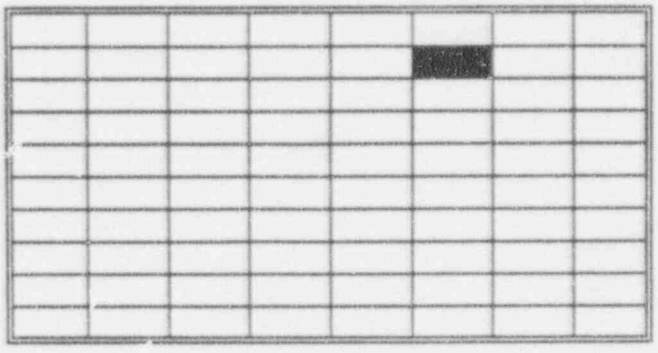
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-027 EG-21

SENSING ELEMENT: TIMER (29 MINUTE) EGEN-2

SSF ANNUNCIATOR RESPONSE	SSF-A2-6-02	Q-6-02



DIESEL GEN B
OVER 3250 KW
FOR 24/29 MIN

EVENT POINT 2001

INDICATED CONDITION:

- DIESEL GENERATOR "B" OVER 3250 KW FOR **>24 MINUTES.**

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- DIESEL GENERATOR "B" KW INDICATION.
- DIESEL GENERATOR "B" "EDG-3B ELAPSED TIME ABOVE 3250 KW" TIMER OPERATING.

OPERATOR ACTIONS FOR A VALID ALARM:

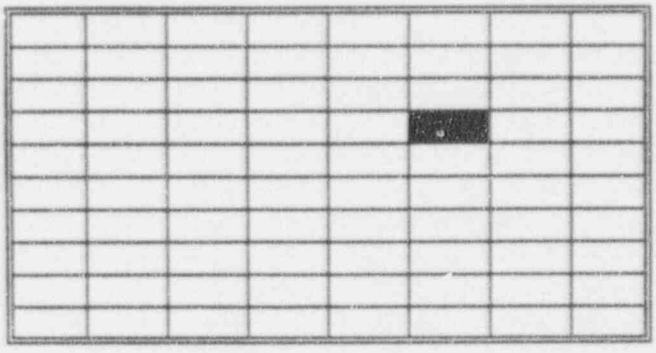
- REFER TO AP-770.

DISCUSSION:

REFERENCES: DRAWING 208-027 EG-21

SENSING ELEMENT: TIMER (24 MINUTE) EGEN-2

SSF ANNUNCIATOR RESPONSE	SSF-A2-6-04	Q-6-04



4KV ES B
UNDERVOLTAGE
TRIP BLOCKED

EVENT POINT 0824

INDICATED CONDITION:

- "B" ES 4160V BUS UNDERVOLTAGE PROTECTION DISABLED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- MONITOR "B" ES BUS VOLTAGES DURING UNDERVOLTAGE RELAY TESTING.

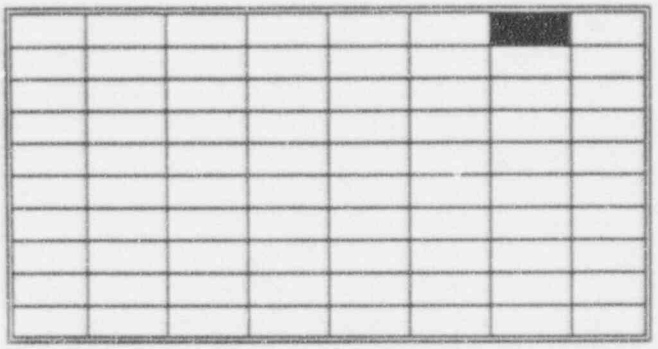
DISCUSSION:

THIS ALARM WILL OCCUR WHEN TESTING THE BUS UNDERVOLTAGE RELAYS. NO UNDER-VOLTAGE PROTECTION IS AVAILABLE DURING TESTING.

REFERENCES: DRAWING 208-040 MT-65B

SENSING ELEMENT: TBS1, TBS2

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-01	Q-07-01



LOCKOUT RELAY
DC POWER
LOSS

EVENT POINT 0726

INDICATED CONDITION:

- BACKUP ES TRANSFORMER LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- FOR THE BACKUP ES TRANSFORMER ONE OR MORE OF THE FOLLOWING:
  PHASE DIFFERENTIAL NEUTRAL GROUND SUDDEN PRESSURE
  LOCKOUT RELAY AMBER INDICATING LIGHTS ARE OFF, LOCATED ON THE REAR SECTION OF THE MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

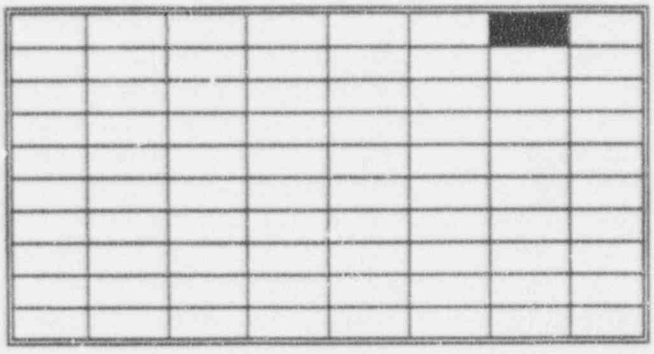
- INVESTIGATE CAUSE OF LOSS OF DC POWER.

DISCUSSION:

REFERENCES. DRAWING 208-040 MT-137, 138, 139

SENSING ELEMENT: 27C/86TNGDBEST, 86SPBEST, 86TBEST

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-01	Q-07-01



B/U ES XFMR
FAULT

EVENT POINT 0727

INDICATED CONDITION:

- BACKUP ES TRANSFORMER PRIMARY PROTECTION

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

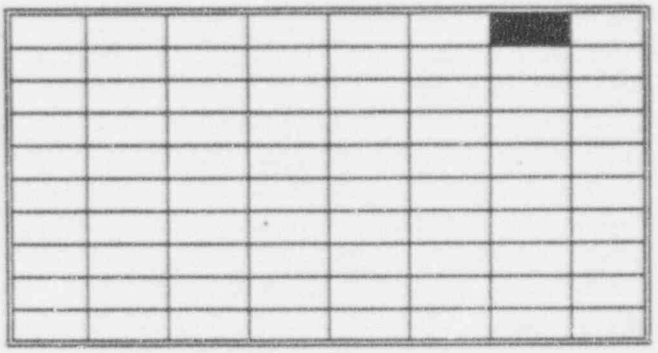
- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-139

SENSING ELEMENT: 86TBEST-1

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-01	Q-07-01



B/U ES XFMR
FAULT

EVENT POINT 0728

INDICATED CONDITION:

- BACKUP ES TRANSFORMER BACKUP PROTECTION

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

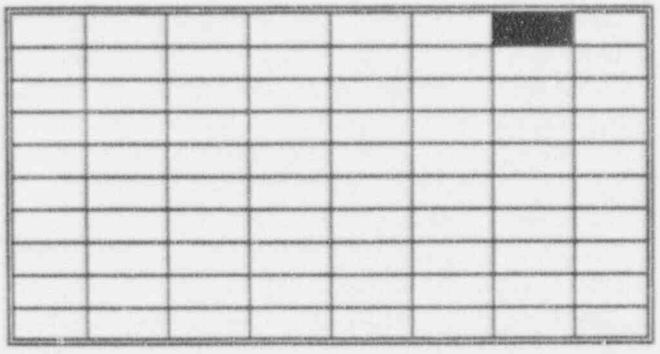
- NOTIFY SYSTEM DISPATCHER.

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-137, 138

SENSING ELEMENT: 27C/86TNGDBEST-1, 86SPBEST-1

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-01	Q-07-01



LOCKOUT RELAY
DC POWER
LOSS

EVENT POINT 0730

INDICATED CONDITION:

- BACKUP ES TRANSFORMER MASTER TRIP LOCKOUT RELAY LOSS OF DC POWER.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- FOR THE BACKUP ES TRANSFORMER LOCKOUT RELAY AMBER INDICATING LIGHTS ARE OFF, LOCATED ON THE REAR SECTION OF THE MCB.

OPERATOR ACTIONS FOR A VALID ALARM:

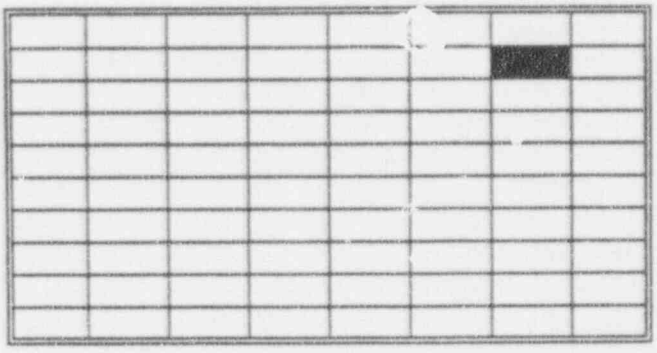
- INVESTIGATE CAUSE OF LOSS OF DC POWER.

DISCUSSION:

REFERENCES: DRAWING 208-C40 MT-137, 138, 139

SENSING ELEMENT: 27C/86BESTMTA, 86BESTMTB

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-02	0-07-02



BREAKER 1691/1692 OPEN

EVENT POINT 0855

INDICATED CONDITION:

- BREAKER 1692 IS OPEN

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON, LOCATED ON THE BREAKER 1692 CONTROL STATION

OPERATOR ACTIONS FOR A VALID ALARM:

- CONTACT UNITS 1 & 2
- CONTACT SYSTEM DISPATCHER

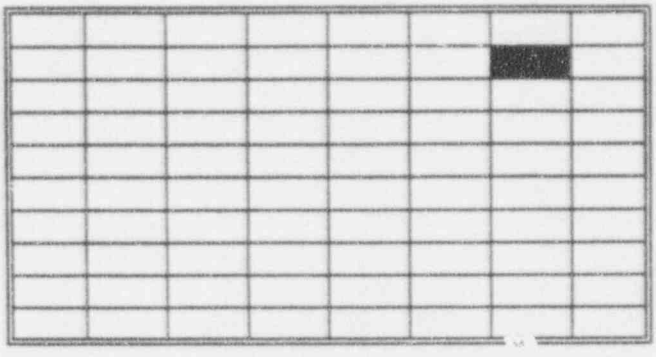
DISCUSSION:

THIS IS A NORMAL ALARM WHEN THE BREAKER IS NOT CLOSED. ONE OF THE FEEDER BREAKERS BEING OPENED ON THE START-UP TRANSFORMERS MAY PRESENT AN OFFSITE POWER AVAILABILITY CONCERN REFER TO STS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING EC-229-102

SENSING ELEMENT: AUXILIARY CONTACT 52a 5/5c

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-02	Q-07-02



BREAKER 1691/1692 OPEN

EVENT POINT 0860

INDICATED CONDITION:

- BREAKER 1692 GROUND FAULT LOCK-OUT RELAY 86FDM HAS ACTUATED, DUE TO CURRENT ON THE NEUTRAL/GROUND SENSED BY RELAY 50G/M

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

BREAKER 3103	BREAKER 3104	BREAKER 3203	BREAKER 3204
BREAKER 3205	BREAKER 3206	BREAKER 1691	BREAKER 1692

OPERATOR ACTIONS FOR A VALID ALARM:

- ENSURE BREAKER 1691 HAS OPENED
- VERIFY THE OPERATION OF THE FOLLOWING LOCK-OUT RELAYS:
  86/FDM 86/PL4 86BU/PL4 86/BBB
- VERIFY ALL FEEDER BREAKERS FROM STARTUP TRANSFORMER ARE OPEN.

BREAKER 3103	BREAKER 3104	BREAKER 3203
BREAKER 3204	BREAKER 3205	BREAKER 3206

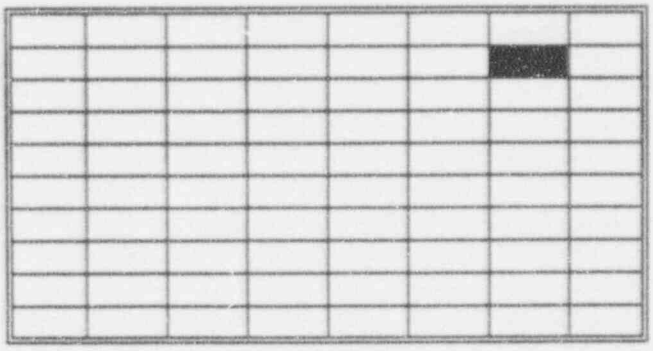
DISCUSSION:

THIS IS INDICATION OF A GROUND ON THE NEUTRAL FOR BREAKER 1692. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING EC-229-103

SENSING ELEMENT: 50G/M, 86/FDM

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-02	Q-07-02



BREAKER 1691/1692 OPEN

EVENT POINT 0861

INDICATED CONDITION:

- BREAKER 1691 IS OPEN

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- GREEN LIGHT IS ON, LOCATED ON THE BREAKER 1691 CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- CONTACT UNITS 1 & 2
- CONTACT SYSTEM DISPATCHER

DISCUSSION:

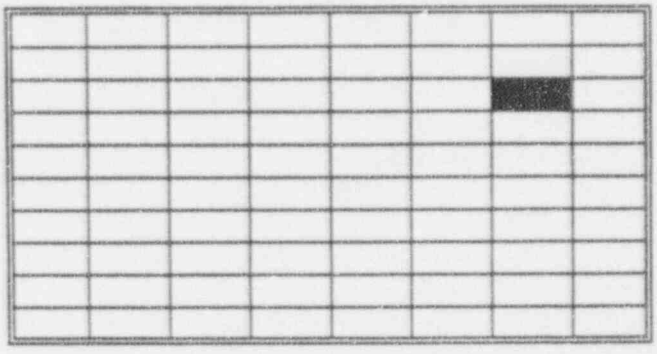
THIS IS A NORMAL ALARM WHEN THE BREAKER IS NOT CLOSED. ONE OF THE FEEDER BREAKERS BEING OPENED ON THE START-UP TRANSFORMERS MAY PRESENT AN OFFSITE POWER AVAILABILITY CONCERN.

REFER TO STS FOR ADMINISTRATIVE REQUIREMENTS.

REFERENCES: DRAWING EC-229-104

SENSING ELEMENT: AUXILIARY CONTACT 52a 5/5c

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-03	Q-07-03



BACKUP ES XFMR
MAJOR ALARM

EVENT POINT 0631

INDICATED CONDITION:

- BACKUP ES TRANSFORMER PRESSURE RELIEF DEVICE HAS ACTUATED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

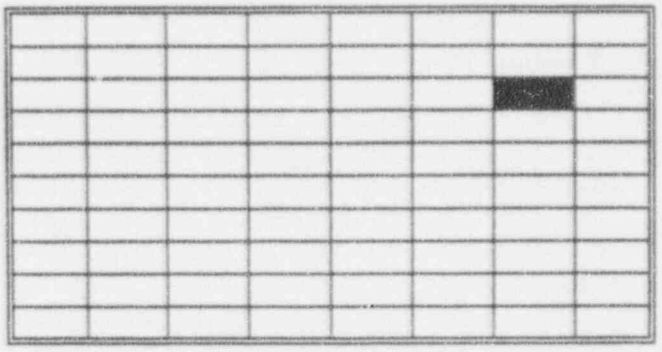
- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-140

SENSING ELEMENT: 63PR

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-03	Q-07-03



BACKUP ES XFMR
MAJOR ALARM

EVENT POINT 0857

INDICATED CONDITION:

- BACKUP ES TRANSFORMER OIL LEVEL LOW

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

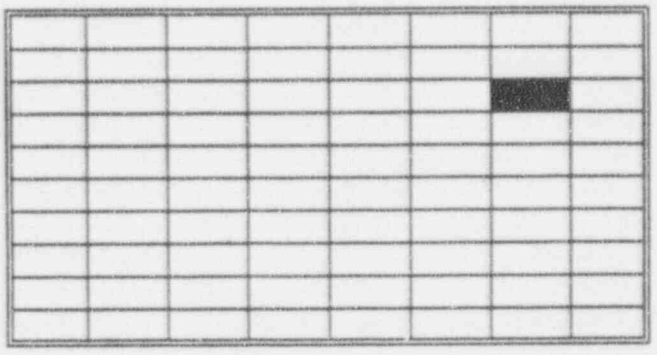
- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-140

SENSING ELEMENT: 71Q

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-03	Q-07-03



BACKUP ES XFMR MAJOR ALARM

EVENT POINT 1813

INDICATED CONDITION:

- BACKUP ES TRANSFORMER TEMPERATURE HIGH DUE TO EITHER OIL TEMPERATURE **>90°C** AS SENSED BY DEVICE 26Q **OR** WINDING TEMPERATURE **>105°C** AS SENSED BY DEVICE 49

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED HIGH TEMP ALARM LIGHT IS ON, LOCATED ON THE BACKUP ES TRANSFORMER ALARM PANEL

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER
- VERIFY ALL OFFSITE POWER TRANSFORMER OIL PUMPS AND FANS OPERATING
- CONSIDERATION SHOULD BE GIVEN TO REDUCE ELECTRICAL LOAD

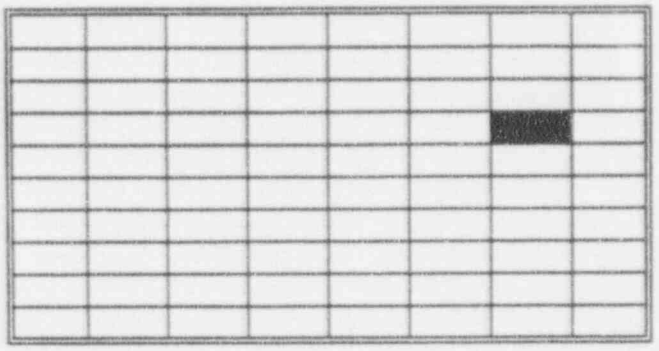
DISCUSSION:

THIS IS INDICATIVE OF A PROBLEM WITH THE TRANSFORMER COOLING SYSTEM CONSIDERATION SHOULD BE GIVEN TO REDUCING THE LOAD ON THE TRANSFORMER.

REFERENCES: DRAWING 208-40 MT-140

SENSING ELEMENT: 26Q

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-04	Q-07-04



BACKUP ES XFMR MINOR ALARM

EVENT POINT 1151

INDICATED CONDITION:

- BACKUP ES TRANSFORMER LOSS OF COOLING/GAS CONTROL

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

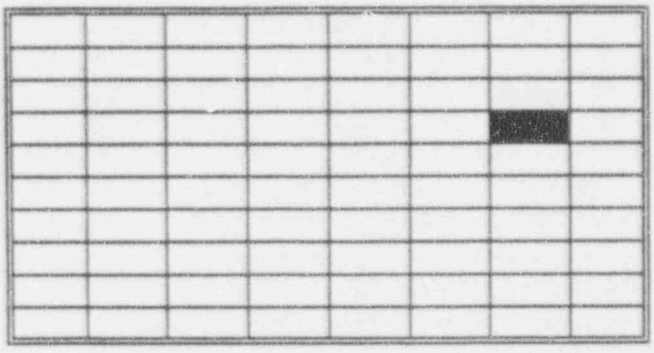
- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-140

SENSING ELEMENT: 74TDOE, 63C, 63RG, 63LG

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-04	Q-07-04



BACKUP ES XFMR
MINOR ALARM

EVENT POINT 1153

INDICATED CONDITION:

- BACKUP ES TRANSFORMER LOSS OF AUXILIARY AC POWER

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

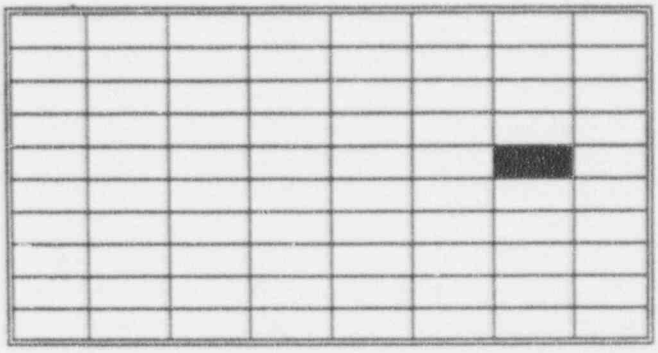
- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING 208-040 MT-140

SENSING ELEMENT: 27-1, 27-1, 27-3

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-05	Q-07-05



BREAKER 1692 TROUBLE

EVENT POINT 0856

INDICATED CONDITION:

- BREAKER 1692 LP AIR SYSTEM PRESSURE IS LOW

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

BREAKER 1692 IS A 230KV AIR OPERATED (ATB) TYPE OF BREAKER.

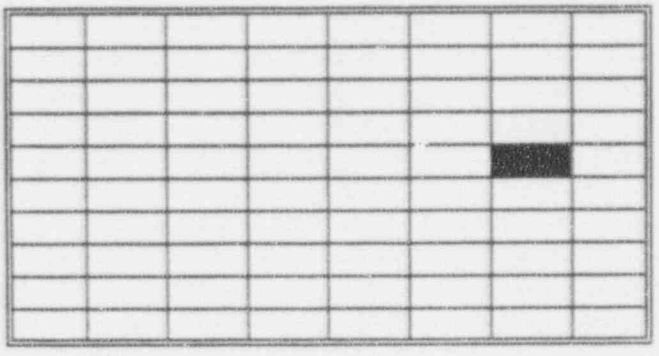
THIS ALARM INDICATES THE BREAKER 1692 AIR OPERATING SYSTEM LP AIR PRESSURE IS BELOW NORMAL, AND THEREFORE LARGE AIR LEAKS, OR COMPRESSOR/COMPRESSOR CONTROL FAILURES ARE PROBABLE.

OPERATING BREAKER 1692 SEVERAL TIMES IN A BRIEF PERIOD OF TIME CAN USE MORE AIR THAN THE RATE AT WHICH THE COMPRESSOR CAN MAINTAIN.

REFERENCES: DRAWING EC-229-102; DRAWING S171 (SUBSTATION)

SENSING ELEMENT: 63AL

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-05	Q-07-05



BREAKER 1692 TROUBLE

EVENT POINT 0859

INDICATED CONDITION:

- BREAKER 1692 HP AIR SYSTEM PRESSURE IS LOW

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

BREAKER 1692 IS A 230KV AIR OPERATED (ATB) TYPE OF BREAKER.

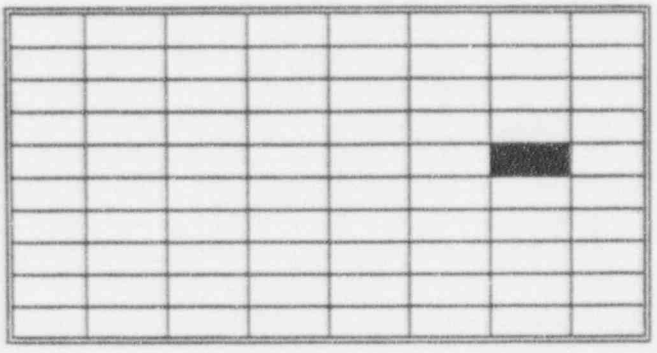
THIS ALARM INDICATES THE BREAKER 1692 AIR OPERATING SYSTEM LP AIR PRESSURE IS BELOW NORMAL, AND THEREFORE LARGE AIR LEAKS, OR COMPRESSOR/COMPRESSOR CONTROL FAILURES ARE PROBABLE.

OPERATING BREAKER 1692 SEVERAL TIMES IN A BRIEF PERIOD OF TIME CAN USE MORE AIR THAN THE RATE AT WHICH THE COMPRESSOR CAN MAINTAIN.

REFERENCES: DRAWING EC-229-102; DRAWING S171 (SUBSTATION)

SENSING ELEMENT: 63AH

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-05	Q-07-05



BREAKER 1692 TROUBLE

EVENT POINT 0866

INDICATED CONDITION:

- BREAKER 1692 AIR COMPRESSOR RUN TIME EXCESSIVE

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

BREAKER 1692 IS A 230KV AIR OPERATED (ATB) TYPE OF BREAKER.

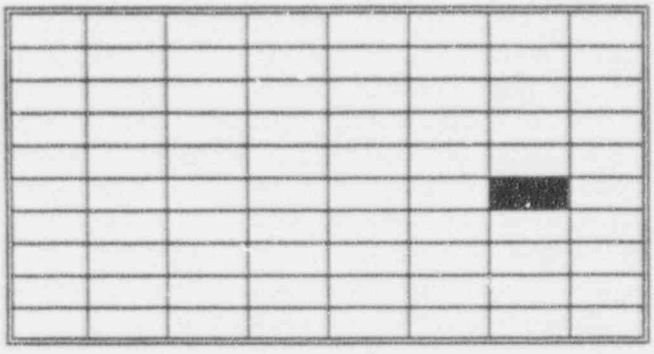
THIS ALARM INDICATES THE BREAKER 1692 AIR OPERATING SYSTEM AIR COMPRESSOR HAS BEEN RUNNING LONGER THAN NORMAL, AND THEREFORE LARGE AIR LEAKS OR FAILURES ARE PROBABLE. THE COMPRESSOR IS USED FOR MAINTAINING THE HIGH PRESSURE RESERVOIR ABOVE THE HP AIR MINIMUM PRESSURE SETPOINT.

OPERATING BREAKER 1692 SEVERAL TIMES IN A BRIEF PERIOD OF TIME CAN USE MORE AIR THAN THE RATE AT WHICH THE COMPRESSOR CAN MAINTAIN.

REFERENCES: DRAWING EC-229-102; DRAWING S171 (SUBSTATION)

SENSING ELEMENT: COMPRESSOR CONTROLLER

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-06	Q-07-06



PLANT LINE 4 FAULT

EVENT POINT 0858

INDICATED CONDITION:

- PLANT LINE 4 PRIMARY DIFFERENTIAL LOCK-OUT RELAY 86/PL4 HAS ACTUATED, DUE TO CURRENT DIFFERENTIAL ON THE PRIMARY SIDE OF THE STARTUP TRANSFORMER AS SENSED BY 87PL4φA, 87PL4φB, OR 87PL4φC

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

BREAKER 3103	BREAKER 3104	BREAKER 3203	BREAKER 3204
BREAKER 3205	BREAKER 3206	BREAKER 1691	BREAKER 1692

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY THE OPERATION OF THE LOCK OUT RELAYS 86/PL4, 86X/PL4
- ENSURE THAT ALL FEEDER BREAKERS FROM THE STARTUP TRANSFORMER ARE OPEN.

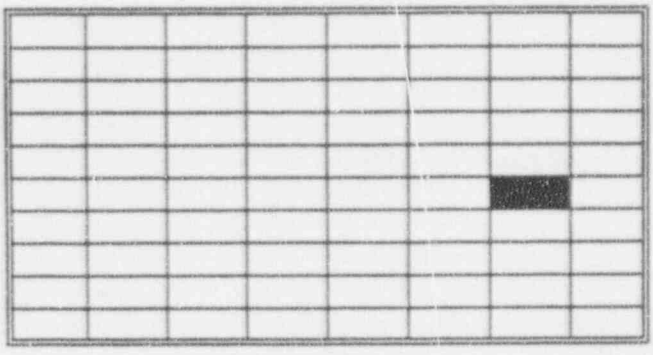
DISCUSSION:

THIS IS INDICATION OF A FAULT ON THE INCOMING 230KV LINE TO THE STARTUP TRANSFORMER. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING EC-207-012 FC-229-107

SENSING ELEMENT: RELAY 86BU/PL4-1, 86BU/PL4-2, 87AUX-φA, 87AUX-φB, 87AUX-φC

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-06	Q-07-06



PLANT LINE 4 FAULT

EVENT POINT 0862

INDICATED CONDITION:

- PLANT LINE 4 BACK-UP DIFFERENTIAL LOCK-OUT RELAY 86BU/PL4 HAS ACTUATED, DUE TO AN OVER CURRENT ON THE PRIMARY SIDE OF THE STARTUP TRANSFORMER AS SENSED BY 87AUXφA, 87AUXφB, OR 8AUX4φC

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

BREAKER 3103	BREAKER 3104	BREAKER 3203	BREAKER 3204
BREAKER 3205	BREAKER 3206	BREAKER 1691	BREAKER 1692

OPERATOR ACTIONS FOR A VALID ALARM:

- VERIFY THE OPERATION OF THE LOCK OUT RELAYS 86BU/PL4, 86BU/PL4
- ENSURE THAT ALL FEEDER BREAKERS FROM THE STARTUP TRANSFORMER ARE OPEN.

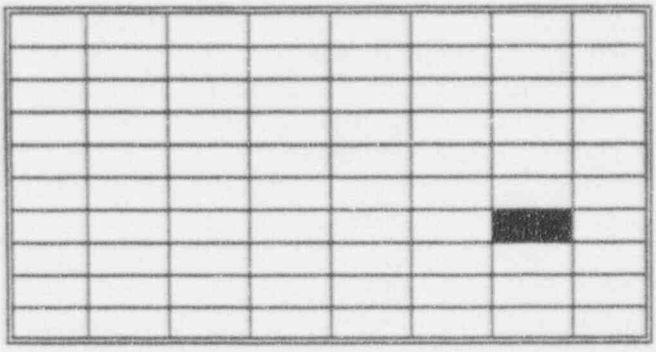
DISCUSSION:

THIS IS INDICATION OF A FAULT ON THE INCOMING 230KV LINE TO THE STARTUP TRANSFORMER. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING EC-207-012, EC-229-107

SENSING ELEMENT: RELAY 86BU/PL4-1, 86BU/PL4-2, 87AUX-φA, 87AUX-φB, 87AUX-φC

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-07	Q-07-07



230KV GRID DEGRADING

EVENT POINT 0827

INDICATED CONDITION:

- 4160V ES BUS 3A VOLTAGE IS < **4019 VAC FOR >2 SECS** AS SENSED BY RELAY 27SLUA/32EA

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- "A" ES 4160V BUS VOLTAGE METER INDICATING < 4019 VAC

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER TO INCREASE GRID VOLTAGE

DISCUSSION:

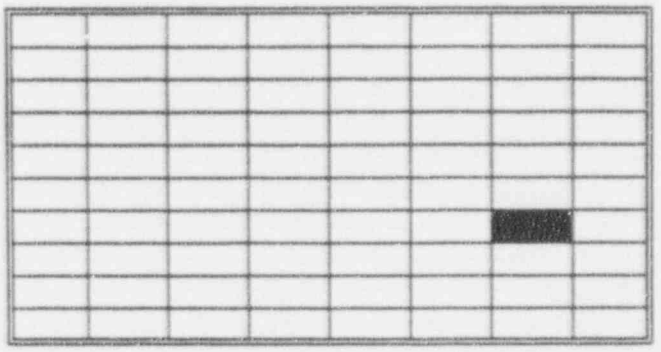
THIS ALARM IS INTENDED TO ALERT OPERATORS OF AN IMPENDING DEGRADED VOLTAGE (SLUR) CONDITION IN THE 230KV GRID. THIS CONDITION IS A PRECURSOR TO A DEGRADED VOLTAGE TRIP OF THE "A" ES 4160V BUS.

ALARM RESET SHOULD OCCUR BETWEEN 4038 AND 4058 VOLTS AC.

REFERENCES: DRAWING 208-040 SHEET MT-131

SENSING ELEMENT: RELAY 27SLUA/32EA

SSF ANNUNCIATOR RESPONSE	SSF-A2-07-07	Q-07-07



230KV GRID DEGRADING

EVENT POINT 0828

INDICATED CONDITION:

- 4160V ES BUS 3B VOLTAGE IS < **4019 VAC FOR >2 SECS** AS SENSED BY RELAY 27SLUB/32EB

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- "B" ES 4160V BUS VOLTAGE METER INDICATING < 4019 VAC

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER TO INCREASE GRID VOLTAGE

DISCUSSION:

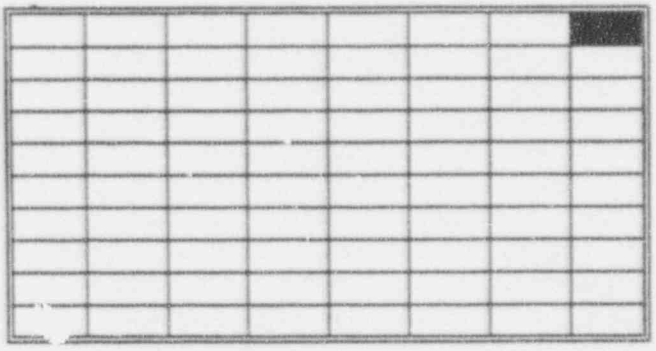
THIS ALARM IS INTENDED TO ALERT OPERATORS OF AN IMPENDING DEGRADED VOLTAGE (SLUR) CONDITION IN THE 230KV GRID. THIS CONDITION IS A PRECURSOR TO A DEGRADED VOLTAGE TRIP OF THE "B" ES 4160V BUS.

ALARM RESET SHOULD OCCUR BETWEEN 4038 AND 4058 VOLTS AC.

REFERENCES: DRAWING 208-040 SHEET MT-132

SENSING ELEMENT: RELAY 27SLUB/32EB

SSF ANNUNCIATOR RESPONSE	SSF-A2-08-01	0-08-01



OFFSITE PWR SOURCE XFMR FAULT

EVENT POINT 0777

INDICATED CONDITION:

- OFFSITE POWER TRANSFORMER GROUND FAULT LOCK-OUT RELAYS 71T9TD, 7BD9, 71T9TN HAS ACTUATED, DUE TO CURRENT ON THE NEUTRAL/GROUND SENSED BY RELAY 50N, 50AN, OR 50AM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

  BREAKER 4900 BREAKER 4902 BREAKER 3211 BREAKER 3212

OPERATOR ACTIONS FOR A VALID ALARM:

- ENSURE THAT FEEDER AND LOAD BREAKERS FROM OFFSITE POWER TRANSFORMER ARE OPEN.
  BREAKER 4900 BREAKER 4902 BREAKER 3211 BREAKER 3212

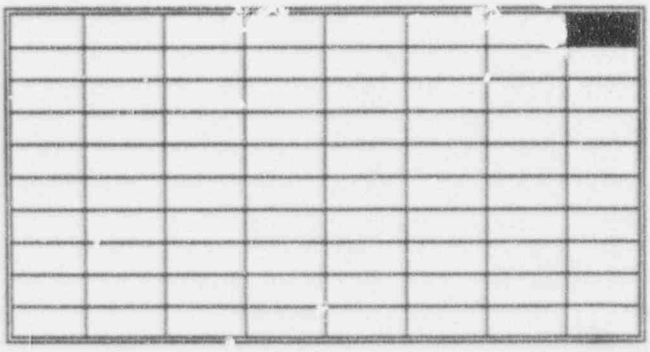
DISCUSSION:

THIS IS INDICATION OF AN INTERNAL GROUND ON THE OFFSITE POWER TRANSFORMER. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING 208-079 SHEET SR-18

SENSING ELEMENT: RELAYS 50N 50AN 50AM

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-1	Q-8-1



OFFSITE PWR SOURCE XFMR FAULT

EVENT POINT 2043

INDICATED CONDITION:

- OFFSITE POWER TRANSFORMER LOCK-OUT RELAYS 71T9SP, 7B0C9 HAVE ACTUATED, DUE TO DETECTION OF A SUDDEN PRESSURE RISE, OR A PHASE DIFFERENTIAL AS SENSED BY DEVICE 50M, AND 50AD

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

  BREAKER 4900 BREAKER 4902 BREAKER 3211 BREAKER 3212

OPERATOR ACTIONS FOR A VALID ALARM:

- ENSURE THAT FEEDER AND LOAD BREAKERS FROM OFFSITE POWER TRANSFORMER ARE OPEN.
  BREAKER 4900 BREAKER 4902 BREAKER 3211 BREAKER 3212

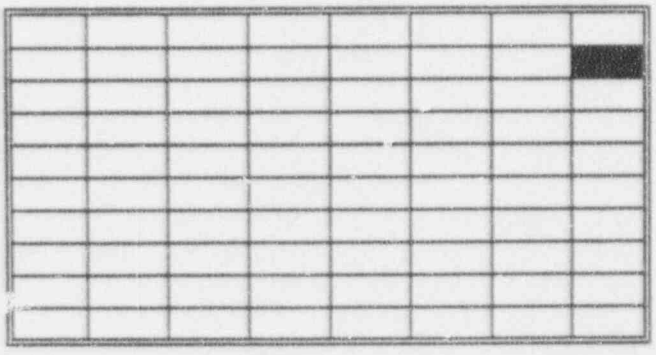
DISCUSSION:

THIS IS INDICATION OF A FLASH OVER ON THE OFFSITE POWER TRANSFORMER. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING 208-079 SHEET SB-18

SENSING ELEMENT: RELAYS 50N 50AN 50AM

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-2	Q-8-2



BREAKER 4900/4902 TRIP

EVENT POINT 1103

INDICATED CONDITION:

- OFF SITE POWER TRANSFORMER PROTECTIVE LOCKOUT RELAY /8DA-PRI, AND/OR 78DA-BU HAVE ACTUATED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

BREAKER 4900 BREAKER 4902 BREAKER 3211 BREAKER 3212

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770
- VERIFY FEEDER AND LOAD BREAKERS FROM OFFSITE POWER TRANSFORMER OPEN
- NOTIFY SYSTEM DISPATCHER

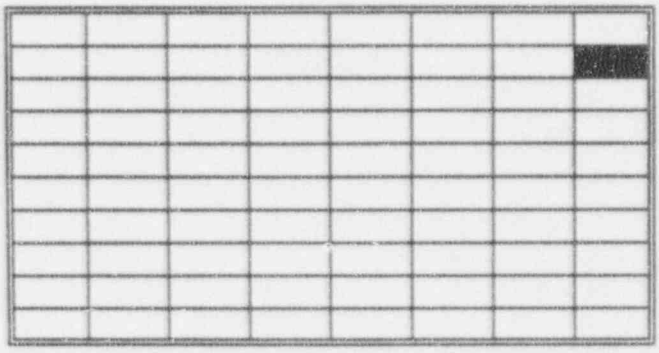
DISCUSSION:

THIS IS INDICATION OF A FAULT ON THE OFFSITE POWER TRANSFORMER. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING 208-079 SHEET 3B-1

SENSING ELEMENT: RELAY 78DA-PRI, 78DA-BU

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-2	Q-8-2



BREAKER 4900/4902 TRIP

EVENT POINT 1104

INDICATED CONDITION:

- OFF SITE POWER TRANSFORMER PROTECTIVE LOCKOUT RELAY 78DB-PRI, AND/OR 78DB-BU HAVE ACTUATED

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- THE FOLLOWING BREAKERS WILL AUTOMATICALLY TRIP AND LOCK-OUT

BREAKER 4900 BREAKER 4902 BREAKER 3211 BREAKER 3212

OPERATOR ACTIONS FOR A VALID ALARM:

- REFER TO AP-770
- VERIFY FEEDER AND LOAD BREAKERS FROM OFFSITE POWER TRANSFORMER OPEN
- NOTIFY SYSTEM DISPATCHER

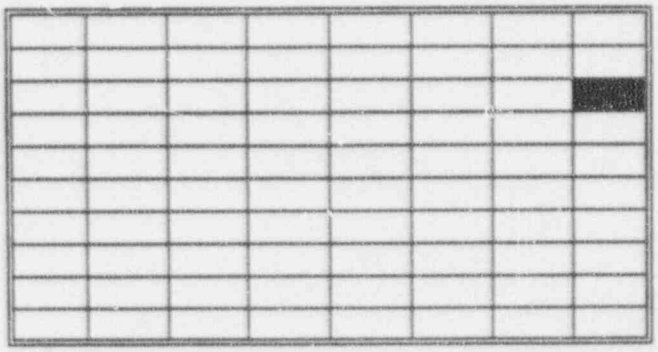
DISCUSSION:

THIS IS INDICATION OF A FAULT ON THE OFFSITE POWER TRANSFORMER. THE LOCK-OUT RELAY ACTUATES TO STRIP THE POWER FEED AND THE LOADS OFF OF THE TRANSFORMER, AND TO PREVENT CLOSING IN A BREAKER ON A FAULTED TRANSFORMER.

REFERENCES: DRAWING 208-079 SHEET SB-18

SENSING ELEMENT: RELAY 78DB-PRI, 78DB-BU

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-3	Q-8-3



OFFSITE PWR SOURCE XFMR MAJOR ALARM

EVENT POINT 1337

INDICATED CONDITION:

- OFFSITE POWER TRANSFORMER PRESS RELIEF DEVICE HAS ACTUATED, DUE TO A PRESSURE **>10 PSIG** AS SENSED BY DEVICE 63PR

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED PRESS RELIEF DEVICE ACTUATING LIGHT IS ON, LOCATED ON THE LOCAL ALARM PANEL
- LOCAL PRESSURE INDICATOR

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER

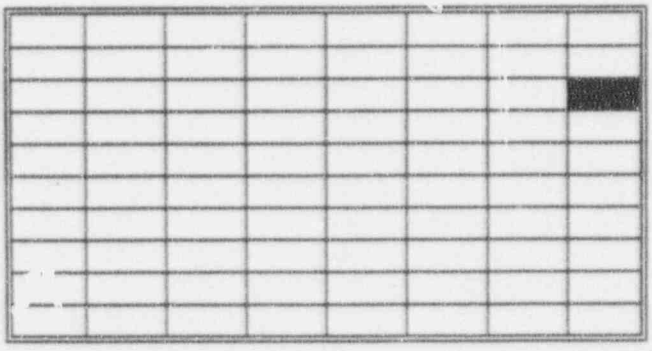
DISCUSSION:

THIS ALARM IS INDICATIVE OF A FAULT INSIDE THE TRANSFORMER, THE LOAD ON THE TRANSFORMER SHOULD BE REDUCED AS MUCH AS POSSIBLE.

REFERENCES: DRAWING 208-079 SHEET SB-018

SENSING ELEMENT: DEVICE 63PR

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-3	Q-8-3



OFFSITE PWR
SOURCE XFMR
MAJOR ALARM

EVENT POINT 1423

INDICATED CONDITION:

- OFFSITE POWER TRANSFORMER TEMPERATURE HIGH DUE TO EITHER OIL TEMPERATURE >90°C AS SENSED BY DEVICE 26Q OR WINDING TEMPERATURE >105°C AS SENSED BY DEVICE 49

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED HIGH TEMP ALARM LIGHT IS ON, LOCATED ON THE OFFSITE POWER TRANSFORMER ALARM PANEL

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER
- VERIFY ALL OFFSITE POWER TRANSFORMER OIL PUMPS AND FANS OPERATING
- CONSIDERATION SHOULD BE GIVEN TO REDUCE ELECTRICAL LOAD

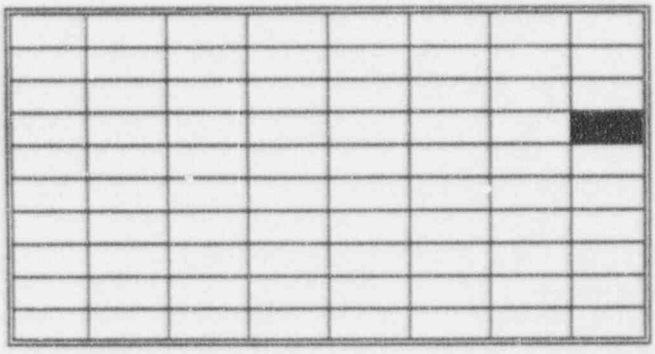
DISCUSSION:

THIS IS INDICATIVE OF A PROBLEM WITH THE TRANSFORMER COOLING SYSTEM CONSIDERATION SHOULD BE GIVEN TO REDUCING THE LOAD ON THE TRANSFORMER.

REFERENCES: DRAWING 208-079 SHEET S3-018

SENSING ELEMENT: 26Q, 49

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-4	Q-8-4



OFFSITE PWR
SOURCE XFMR
MINOR ALARM

EVENT POINT 0496

INDICATED CONDITION:

- OFFSITE POWER TRANSFORMER HAS EXPERIENCED A LOSS OF 480V AUXILIARY POWER AS SENSED BY T9AL(27) VOLTAGE RELAY

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED ALARM LIGHT IS ON, LOCATED ON THE OFFSITE POWER TRANSFORMER LOCAL ALARM PANEL

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY THE SYSTEM DISPATCHER

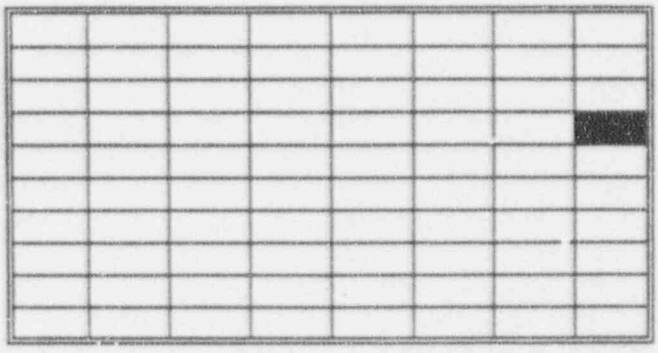
DISCUSSION:

THIS CONDITION SHOULD NOT CAUSE ANY CONCERN, AS THERE IS A BACK UP POWER SUPPLY AS WELL AS A NORMAL POWER SUPPLY. THE TRANSFORMER SHOULD CONTINUE TO BE FUNCTIONAL.

REFERENCES: DRAWING 208-079 SHEET SB-018

SENSING ELEMENT: T9AL(27)

SSF ANNUNCIATOR RESPONSE	SSF-A2-8-4	Q-8-4



OFFSITE PWR
SOURCE XFMR
MINOR ALARM

EVENT POINT 0797

INDICATED CONDITION:

- OFFSITE POWER TRANSFORMER COOLING FANS, OR OIL PUMPS ARE NOT RUNNING AS REQUIRED BY THE TEMPERATURE SWITCHES. AS SENSED BY T9AL(74/TDOE)

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- RED ALARM LIGHTS ARE ON, LOCATED ON THE LOCAL ALARM PANEL

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY THE SYSTEM DISPATCHER
- REDUCE LOAD ON THE TRANSFORMER
- START ALL PUMPS AND FANS IN MANUAL

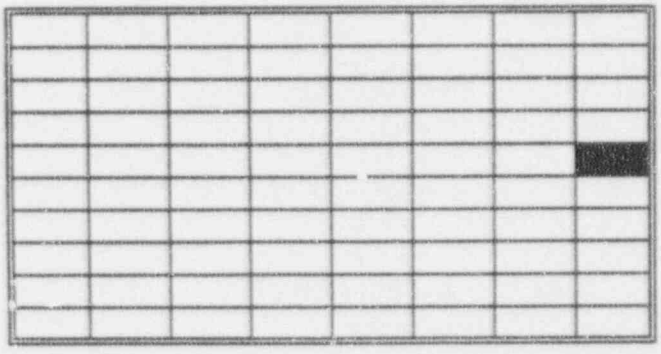
DISCUSSION:

THIS CONDITION COULD CAUSE AN OVERHEATING PROBLEM WITH THE TRANSFORMER, CONSIDERATIONS SHOULD BE GIVING TO UNLOADING THE TRANSFORMER UNTIL THE PROBLEM IS CORRECTED.

REFERENCES: DRAWING 208-079 SHEET SB-018

SENSING ELEMENT: T9AL(74/TDOE)

SSF ANNUNCIATOR RESPONSE	SSF-A2-08-05	Q-08-05



BREAKER
4900/4902
TROUBLE

EVENT POINT 0146

INDICATED CONDITION:

- BREAKER 4900 FAILED TO TRIP OPEN

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER 4900 IS CLOSED

OPERATOR ACTIONS FOR A VALID ALARM:

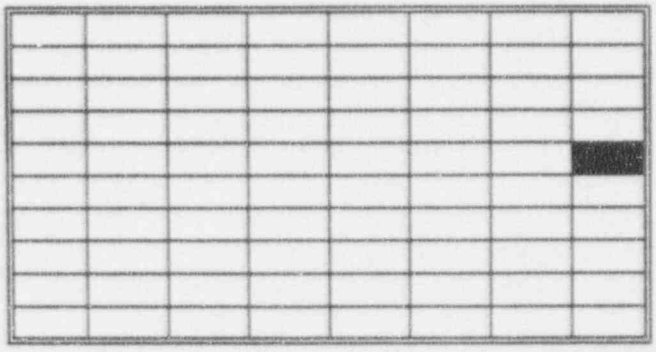
- OPEN BREAKER 4900

DISCUSSION:

REFERENCES: DRAWING 208-079, SB-18

SENSING ELEMENT: BF4900

SSF ANNUNCIATOR RESPONSE	SSF-A2-08-05	Q-08-05



BREAKER 4900/4902 TROUBLE

EVENT POINT 0147

INDICATED CONDITION:

- BREAKER 4902 FAILED TO TRIP OPEN

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- BREAKER 4902 IS CLOSED

OPERATOR ACTIONS FOR A VALID ALARM:

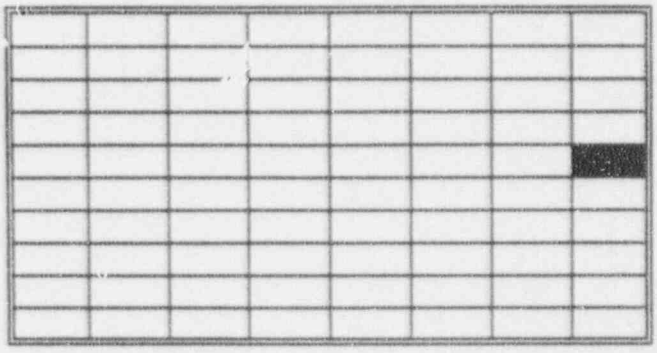
- OPEN BREAKER 4902

DISCUSSION:

REFERENCES: DRAWING 209-079, SB-18

SENSING ELEMENT: BF4902

SSF ANNUNCIATOR RESPONSE	SSF-A2-08-05	Q-08-05



BREAKER 4900/4902 TROUBLE

EVENT POINT 1883

INDICATED CONDITION:

- BREAKER 4900 LOW GAS/SPRING CHARGE

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

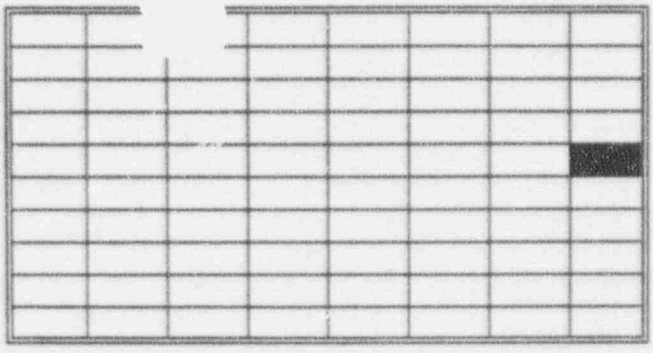
- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING EC-229-109

SENSING ELEMENT: 49EE, 48FF

SSF ANNUNCIATOR RESPONSE	SSF-A2-08-05	Q-08-05



BREAKER 4900/4902 TROUBLE

EVENT POINT 1891

INDICATED CONDITION:

- BREAKER 4902 LOW GAS/SPRING CHARGE

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

OPERATOR ACTIONS FOR A VALID ALARM:

- NOTIFY SYSTEM DISPATCHER

DISCUSSION:

REFERENCES: DRAWING EC-229-110

SENSING ELEMENT: 48KK, 48LL