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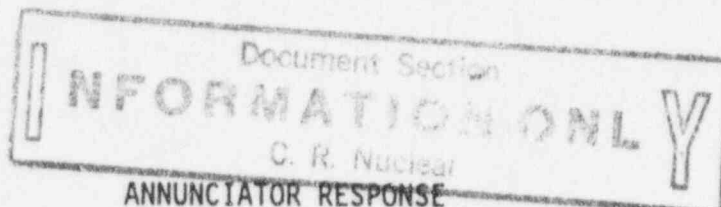
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Rev. 14

Effective Date

4-11-96



AR-504

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

ICS L ANNUNCIATOR RESPONSE

APPROVED BY: Interpretation Contact

[Signature]
(SIGNATURE ON FILE)

DATE:

4/10/96

INTERPRETATION CONTACT: Manager, Nuclear Operations Support

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1.0 PURPOSE

- 1.1 Establish a reference document for each Annunciator Window on the ICS-CY4 Lampbox.
- 1.2 Establish operator actions for valid Annunciator alarms on the ICS-CY4 Lampbox.
- 1.3 Establish a reference to other procedures which address operator actions for valid Annunciator alarms on the ICS-CY4 Lampbox.

2.0 REFERENCES

2.1 IMPLEMENTING REFERENCES

- 2.1.1 AP-545, "Plant Runback"
- 2.1.2 OP-605, "Feedwater System"
- 2.1.3 EOP, Emergency Operating Procedure

2.2 DEVELOPMENTAL REFERENCES

- 2.2.1 INPO 90-021, Good Practice OP-217, Alarm Response Procedures
- 2.2.2 Annunciator Window Engraving Drawing E-224-048
- 2.2.3 MAR 92-04-01-02, Lube Oil Purifier Installation (Electrical)

3.0 PERSONNEL INDOCTRINATION

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

4.0 INSTRUCTIONS

- 4.1 Respond to alarms on the ICS-CY4 Lampbox as indicated in Enclosure 1, Annunciator Response.

5.0 FOLLOW-UP ACTIONS

None

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-01	L-01-01
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**FWP A
TRIP**

EVENT POINT 1455

INDICATED CONDITION:

- o FEEDWATER PUMP 2A CONTROL OIL PRESSURE <55 PSIG AS SENSED BY FW-135-PS2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CONTROL OIL PRESSURE INDICATION.
- o RED TRIP INDICATING LIGHT IS ON.
- o FEEDWATER PUMP SPEED INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF REACTOR POWER >55% RTP, THEN REFER TO AP-545.
- o IF ALL FEEDWATER HAS BEEN LOST, REFER TO EOP.
- o VERIFY PROPER OPERATION OF FEEDWATER BEARING/CONTROL OIL SYSTEMS.

DISCUSSION:

CONDITIONS THAT WILL TRIP A MAIN FEEDWATER PUMP:

TURBINE OVERSPEED (5,555 RPM)	LOSS OF TRIPPING POWER
LOSS OF BOTH BOOSTER PUMPS	LUBE OIL PRESS. <5 PSIG.
MISSING SPEED SIGNAL <100 RPM	MAIN FEEDWATER ISO ACTUATION
FEED PUMP SUCT. VALVES <25% OPEN	MANUAL TURBINE TRIP.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-135-PS2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-01	L-01-01
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FWP A
TRIP

EVENT POINT 1492

INDICATED CONDITION:

- o FEEDWATER PUMP 2A CONTROL OIL PRESSURE <55 PSIG AS SENSED BY FW-320-PS, FW-321-PS, FW-322-PS OR FW-323-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RPS CHANNEL A,B,C, OR D FEED PUMP TRIP AUX RELAY MFP "A" INDICATION IS BRIGHT.
- o RED TRIP INDICATING LIGHT IS ON.
- o FEEDWATER PUMP SPEED INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF REACTOR POWER >55% RTP, THEN REFER TO AP-545.
- o IF ALL FEEDWATER HAS BEEN LOST, REFER TO EOP.
- o VERIFY PROPER OPERATION OF FEEDWATER BEARING/CONTROL OIL SYSTEMS.

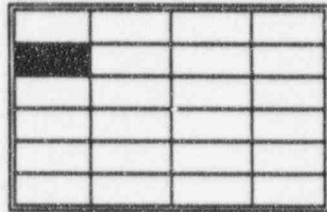
DISCUSSION:

THIS ALARM INDICATES THAT ONE OR MORE RPS CHANNELS HAS RECEIVED A FEED PUMP TRIP SIGNAL FROM THE CONTROL OIL PRESSURE SWITCHES ASSOCIATED WITH THAT FEED PUMP. THIS MAY NOT BE INDICATIVE OF AN ACTUAL FEED PUMP TRIP CONDITION.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-320,321,322,323-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-02	L-01-02
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**FWP A
VIBRATION
HIGH**

EVENT POINT 1464

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2A OUTBOARD PUMP BEARING VIBRATION IS EITHER:
 >4.9 MILS, (ALERT) OR, >4.9 MILS, (DANGER) AS SENSED BY FW-269-MIS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

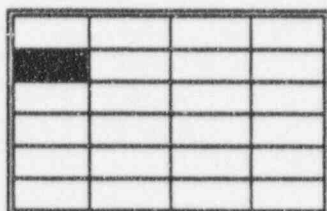
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-269-MIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-02	L-01-02
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**FWP A
VIBRATION
HIGH**

EVENT POINT 1465

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2A INBOARD TURBINE BEARING VIBRATION IS EITHER:
>2.4 MILS, (ALERT) OR, >3.5 MILS, (DANGER) AS SENSED BY FW-239-MIS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

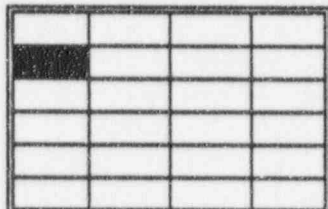
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-239-MIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-02	L-01-02
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FWP A
VIBRATION
HIGH

EVENT POINT 1466

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2A OUTBOARD TURBINE BEARING VIBRATION IS EITHER:
>2.4 MILS, (ALERT) OR, >3.5 MILS, (DANGER) AS SENSED BY FW-241-MIS1.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

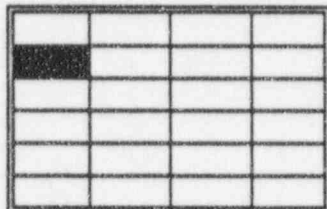
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-241-MIS1

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-02	L-01-02
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**FWP A
VIBRATION
HIGH**

EVENT POINT 1469

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2A INBOARD PUMP BEARING VIBRATION IS EITHER:
>3.5 MILS, (ALERT) OR, >4.0 MILS, (DANGER) AS SENSED BY FW-267-MIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

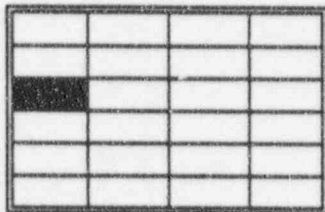
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-267-MIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-03	L-01-03
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FWP A
OIL PRESS
LOW

EVENT POINT 1436

INDICATED CONDITION:

- o FEEDWATER PUMP 2A LUBE OIL PRESSURE <18 PSIG AS SENSED BY FW-186-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP 2A LUBE OIL PRESSURE INDICATOR FW-203-PI.
- o STANDBY LUBE OIL PUMP AUTO STARTS, FWP-3A, FWP-4A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE STANDBY LUBE OIL PUMP AUTO STARTS.
- o ENSURE PROPER FEED PUMP LUBE OIL RESERVOIR LEVEL.
- o ENSURE PROPER FEED PUMP LUBE OIL TEMPERATURE.

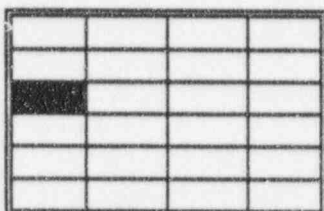
DISCUSSION:

FEED PUMP TRIPS AT LUBE OIL PRESSURE <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-07

SENSING ELEMENT: FW-186-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-03	L-01-03
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FWP A
OIL PRESS
LOW

EVENT POINT 1437

INDICATED CONDITION:

- o FEEDWATER PUMP 2A CONTROL OIL PRESSURE <90 PSIG AS SENSED BY FW-195-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP 2A CONTROL OIL PRESSURE INDICATOR FW-205-PI.
- o STANDBY LUBE OIL PUMP AUTO STARTS, FWP-3A, FWP-4A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE STANDBY LUBE OIL PUMP AUTO STARTS.
- o ENSURE PROPER FEED PUMP LUBE OIL RESERVOIR LEVEL.
- o ENSURE PROPER FEED PUMP LUBE OIL TEMPERATURE.

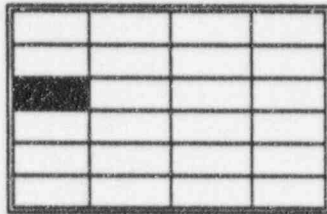
DISCUSSION:

FEED PUMP CONTROL OIL SENDS A TRIP SIGNAL TO RPS WHEN CONTROL OIL PRESSURE IS <55 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-07

SENSING ELEMENT: FW-195-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-03	L-01-03
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FWP A
OIL PRESS
LOW

EVENT POINT 1448

INDICATED CONDITION:

- o FEEDWATER PUMP 2A LUBE OIL PRESSURE <12 PSIG AS SENSED BY FW-187-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP 2A LUBE OIL PRESSURE INDICATOR FW-203-PI.
- o EMERGENCY LUBE OIL PUMP, FWP-5A STARTS.
- o STANDBY LUBE OIL PUMP AUTO STARTS, FWP-3A, FWP-4A.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE STANDBY LUBE OIL PUMP AUTO STARTS.
- o VERIFY PROPER FEED PUMP LUBE OIL RESERVOIR LEVEL.
- o VERIFY PROPER FEED PUMP LUBE OIL TEMPERATURE.

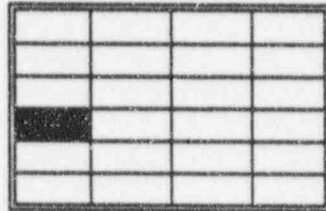
DISCUSSION:

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-34

SENSING ELEMENT: FW-187-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-04	L-01-04
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FWP A
LUBE OIL PUMP
TRIP

EVENT POINT 1438

INDICATED CONDITION:

- o FWP-3A BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON FWP-3A CONTROL STATION.
- o STANDBY FEEDWATER LUBE OIL PUMP AUTO STARTS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE FWP-4A, BACKUP FEEDWATER LUBE OIL PUMP, IS RUNNING.
- o INVESTIGATE CAUSE OF PUMP TRIP.

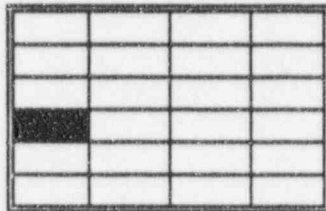
DISCUSSION:

THIS PUMP SUPPLIES BOTH LUBE OIL AND CONTROL OIL TO THE FEED PUMP.

REFERENCES: DRAWING 208-032 SHEET FW-07

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-04	L-01-04
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FWP A
LUBE OIL PUMP
TRIP

EVENT POINT 1444

INDICATED CONDITION:

- o FWP-4A BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON FWP-4A CONTROL STATION.
- o FWP-3A, STANDBY FEEDWATER LUBE OIL PUMP, AUTO STARTS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE FWP-3A, BACKUP FEEDWATER LUBE OIL PUMP IS RUNNING.
- o INVESTIGATE CAUSE OF PUMP TRIP.

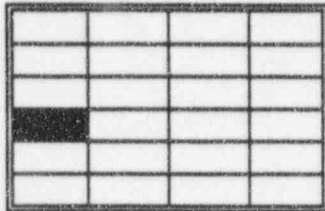
DISCUSSION:

THIS PUMP SUPPLIES BOTH LUBE OIL AND CONTROL OIL TO THE FEED PUMP.

REFERENCES: DRAWING 208-032 SHEET FW-09

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-04	L-01-04
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FWP A
LUBE OIL PUMP
TRIP

EVENT POINT 1450

INDICATED CONDITION:

- o FWP-5A BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON FWP-5A CONTROL STATION.
- o FWP-3A, FWP-4A STANDBY FEEDWATER LUBE OIL PUMPS AUTO START.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE BACKUP FEEDWATER LUBE OIL PUMP, FWP-3A IS RUNNING.
- o IF NO LUBE OIL PUMPS ARE RUNNING, THEN VERIFY THAT FWP-2A IS NOT ROLLING.
- o INVESTIGATE CAUSE OF PUMP TRIP.

DISCUSSION:

THIS PUMP SUPPLIES ONLY BEARING LUBE OIL TO THE FEED PUMP, NOT CONTROL OIL.

REFERENCES: DRAWING 208-032 SHEET FW-34

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-05	L-01-05
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FWP A
EMERG OIL PP
AUTO START

EVENT POINT 1449

INDICATED CONDITION:

- o FWP-5A BREAKER CLOSED WITH THE CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON FWP-5A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF AUTO START.
- o VERIFY PROPER LUBE OIL SYSTEM OPERATION.

DISCUSSION:

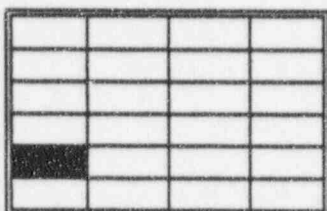
FWP-5A WILL AUTO START WHEN LUBE OIL PRESSURE DROPS TO <12 PSIG.

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-034

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-05	L-01-05
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**FWP A
EMERG OIL PP
AUTO START**

EVENT POINT 1496

INDICATED CONDITION:

- o FWP-3A BREAKER CLOSED WITH THE CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON FWP-3A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF AUTO START.
- o VERIFY PROPER LUBE OIL SYSTEM OPERATION.

DISCUSSION:

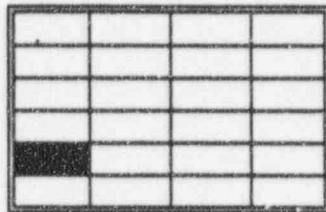
FWP-3A WILL AUTO START WHEN LUBE OIL PRESSURE DROPS TO <18 PSIG OR WHEN CONTROL OIL PRESSURE DROPS TO <90 PSIG.

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-007

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-05	L-01-05
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**FWP A
EMERG OIL PP
AUTO START**

EVENT POINT 1498

INDICATED CONDITION:

- o FWP-4A BREAKER CLOSED WITH THE CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON FWP-4A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF AUTO START.
- o VERIFY PROPER LUBE OIL SYSTEM OPERATION.

DISCUSSION:

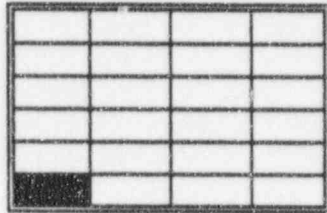
FWP-4A WILL AUTO START WHEN LUBE OIL PRESSURE DROPS TO <18 PSIG OR WHEN CONTROL OIL PRESSURE DROPS TO <90 PSIG.

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-009

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-06	L-01-06
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FWP A LUBE OIL
RESVR LEVEL
HIGH/LOW

EVENT POINT 1460

INDICATED CONDITION:

- o FEEDWATER PUMP 2A LUBE OIL RESERVOIR LEVEL HIGH AS SENSED BY FW-207-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LO-861-SV CLOSED ON HIGH LEVEL.
- o LOCAL RESERVOIR SIGHT GLASS INDICATION.
- o LOCAL RESERVOIR DIPSTICK LEVEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CHECK LUBE OIL DRAIN FLOWPATH TO THE LUBE OIL PURIFIER.

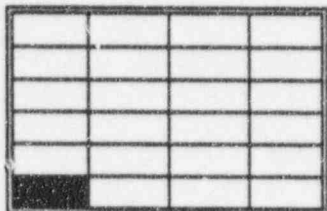
DISCUSSION:

THIS ALARM WILL ACTUATE WHEN OIL LEVEL REACHES 15 INCHES BELOW THE TOP OF THE BOTTOM FLANGE OF THE LEVEL SWITCH.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-207-LS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-01-06	L-01-06
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FWP A LUBE OIL
RESVR LEVEL
HIGH/LOW

EVENT POINT 1461

INDICATED CONDITION:

- o FEEDWATER PUMP 2A LUBE OIL RESERVOIR LEVEL LOW AS SENSED BY FW-207-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LUBE OIL SYSTEM PRESSURE INDICATION.
- o LOCAL RESERVOIR SIGHT GLASS INDICATION.
- o LOCAL RESERVOIR DIPSTICK LEVEL

OPERATOR ACTIONS FOR A VALID ALARM:

- o CHECK LUBE OIL SYSTEM FOR EVIDENCE OF LEAKS.
- o ADD OIL TO LUBE OIL RESERVOIR AS NECESSARY.

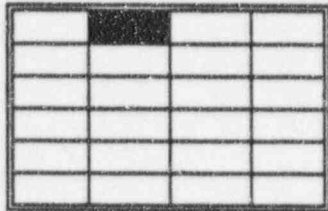
DISCUSSION:

IF A LARGE LUBE OIL LEAK EXISTS, CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE MAIN FEED PUMP. THIS ALARM WILL ACTUATE WHEN OIL LEVEL REACHES 30 INCHES BELOW THE TOP OF THE BOTTOM FLANGE OF THE LEVEL SWITCH.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-207-LS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-01	L-02-01
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**FWP B
TRIP**

EVENT POINT 1471

INDICATED CONDITION:

- o FEEDWATER PUMP 2B CONTROL OIL PRESSURE <55 PSIG AS SENSED BY FW-136-PS2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o CONTROL OIL PRESSURE INDICATION.
- o RED TRIP INDICATION.
- o FEEDWATER PUMP SPEED INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF REACTOR POWER >55% RTP, THEN REFER TO AP-545.
- o IF ALL FEEDWATER HAS BEEN LOST, REFER TO EOP.
- o VERIFY PROPER OPERATION OF FEEDWATER BEARING/CONTROL OIL SYSTEMS.

DISCUSSION:

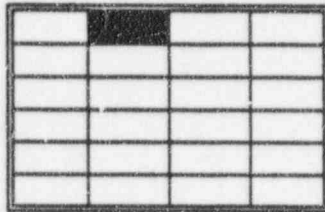
CONDITIONS THAT WILL TRIP A MAIN FEEDWATER PUMP:

TURBINE OVERSPEED (5,555 RPM)	LOSS OF TRIPPING POWER
LOSS OF BOTH BOOSTER PUMPS	LUBE OIL PRESS. <5 PSIG.
MISSING SPEED SIGNAL <100 RPM	MAIN FEEDWATER ISO ACTUATION
FEED PUMP SUCT. VALVES <25% OPEN	MANUAL TURBINE TRIP.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-136-PS2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-01	L-02-01
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**FWP B
TRIP**

EVENT POINT 1493

INDICATED CONDITION:

- o FEEDWATER PUMP 2B CONTROL OIL PRESSURE <55 PSIG AS SENSED BY FW-324-PS, FW-325-PS, FW-326-PS OR FW-327-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RPS CHANNEL A, B, C, OR D FEED PUMP TRIP AUX RELAY MFP "B" INDICATION IS BRIGHT.
- o RED TRIP INDICATION.
- o FEEDWATER PUMP SPEED INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF REACTOR POWER >55% RTP, THEN REFER TO AP-545.
- o IF ALL FEEDWATER HAS BEEN LOST, REFER TO EOP.
- o VERIFY PROPER OPERATION OF FEEDWATER BEARING/CONTROL OIL SYSTEMS.

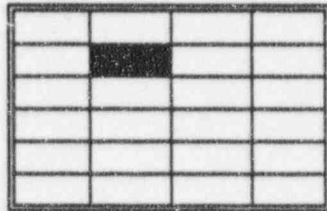
DISCUSSION:

THIS ALARM INDICATES THAT ONE OR MORE RPS CHANNELS HAS RECEIVED A FEED PUMP TRIP SIGNAL FROM THE CONTROL OIL PRESSURE SWITCHES ASSOCIATED WITH THAT FEED PUMP. THIS MAY NOT BE INDICATIVE OF AN ACTUAL FEED PUMP TRIP CONDITION.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-324, 325, 326, 327-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-02	L-02-02
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**FWP B
VIBRATION
HIGH**

EVENT POINT 1480

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2B OUTBOARD PUMP BEARING VIBRATION IS EITHER:
>3.5 MILS, (ALERT) OR, >4 MILS, (DANGER) AS SENSED BY FW-270-MIS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

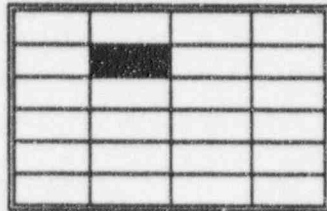
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-270-MIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-02	L-02-02
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**FWP B
VIBRATION
HIGH**

EVENT POINT 1481

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2B INBOARD TURBINE BEARING VIBRATION IS EITHER:
>2.4 MILS, (ALERT) OR, >3.5 MILS, (DANGER) AS SENSED BY FW-240-MIS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

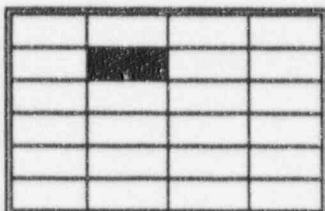
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-240-MIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-02	L-02-02
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**FWP B
VIBRATION
HIGH**

EVENT POINT 1482

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2B OUTBOARD TURBINE BEARING VIBRATION IS EITHER:
 >2.4 MILS, (ALERT) OR, >3.5 MILS, (DANGER) AS SENSED BY FW-242-MIS1.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

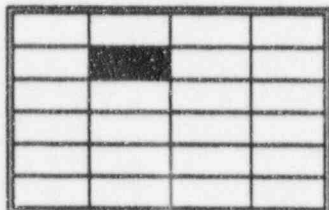
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-242-MIS1

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-02	L-02-02
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**FWP B
VIBRATION
HIGH**

EVENT POINT 1485

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP 2B INBOARD PUMP BEARING VIBRATION IS EITHER:
>3.5 MILS, (ALERT) OR, >4.0 MILS, (DANGER) AS SENSED BY FW-268-MIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP VIBRATION MONITORING PANEL INDICATIONS.
- o VIBRATION IS FELT AT FWP-2B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF VIBRATION IS IN "ALERT", CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF VIBRATION IS IN "DANGER", THEN CONSIDERATION SHOULD BE GIVEN TO REDUCING FLOW THROUGH THE PUMP UNTIL THE DANGER ALARM CAN BE CLEARED.

DISCUSSION:

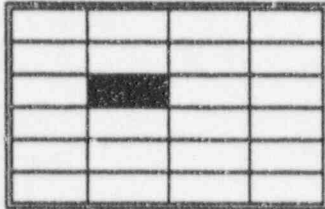
REFER TO OP-605 FOR VIBRATION SETPOINTS.

THIS ALARM MUST BE MANUALLY RESET AT THE FEEDWATER PUMP VIBRATION MONITORING PANEL WHEN THE VIBRATION CONDITION HAS CLEARED.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-268-MIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-03	L-02-03
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FWP B
OIL PRESS
LOW

EVENT POINT 1439

INDICATED CONDITION:

- o FEEDWATER PUMP 2B LUBE OIL PRESSURE <18 PSIG AS SENSED BY FW-191-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP 2B LUBE OIL PRESSURE INDICATOR FW-204-PI.
- o STANDBY LUBE OIL PUMP AUTO STARTS, FWP-3B, FWP-4B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE STANDBY LUBE OIL PUMP AUTO STARTS.
- o VERIFY PROPER FEED PUMP LUBE OIL RESERVOIR LEVEL.
- o VERIFY PROPER FEED PUMP LUBE OIL TEMPERATURE.

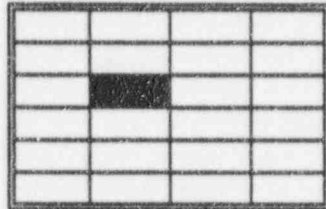
DISCUSSION:

FEED PUMP TRIPS AT LUBE OIL PRESSURE <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-08

SENSING ELEMENT: FW-191-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-03	L-02-03
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FWP B
OIL PRESS
LOW

EVENT POINT 1440

INDICATED CONDITION:

- o FEEDWATER PUMP 2B CONTROL OIL PRESSURE <90 PSIG AS SENSED BY FW-198-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP 2B CONTROL OIL PRESSURE INDICATOR FW-206-PI.
- o STANDBY LUBE OIL PUMP AUTO STARTS, FWP-3B, FWP-4B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE STANDBY LUBE OIL PUMP AUTO STARTS.
- o VERIFY PROPER FEED PUMP LUBE OIL RESERVOIR LEVEL.
- o VERIFY PROPER FEED PUMP LUBE OIL TEMPERATURE.

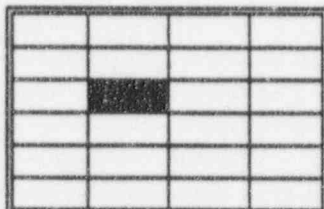
DISCUSSION:

FEED PUMP CONTROL OIL SENDS A TRIP SIGNAL TO RPS WHEN CONTROL OIL PRESSURE IS <55 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-08

SENSING ELEMENT: FW-198-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-03	L-02-03
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FWP B
OIL PRESS
LOW

EVENT POINT 1451

INDICATED CONDITION:

- o FEEDWATER PUMP 2B LUBE OIL PRESSURE <12 PSIG AS SENSED BY FW-192-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEEDWATER PUMP 2B LUBE OIL PRESSURE INDICATOR FW-204-PI.
- o EMERGENCY LUBE OIL PUMP, FWP-5B STARTS.
- o STANDBY LUBE OIL PUMP AUTO STARTS, FWP-3B, FWP-4B.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE STANDBY LUBE OIL PUMP AUTO STARTS.
- o VERIFY PROPER FEED PUMP LUBE OIL RESERVOIR LEVEL.
- o VERIFY PROPER FEED PUMP LUBE OIL TEMPERATURE.

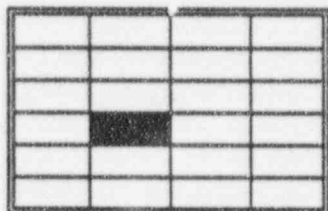
DISCUSSION:

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE <5 PSIG.

REFERENCES: DRAWING 208-C32 SHEET FW-35

SENSING ELEMENT: FW-192-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-04	L-02-04
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FWP B
LUBE OIL PUMP
TRIP

EVENT POINT 1441

INDICATED CONDITION:

- o FWP-3B BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON FWP-3B CONTROL STATION.
- o STANDBY FEEDWATER LUBE OIL PUMP FWP-3B, FWP-4B, AUTO STARTS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE BACKUP FEEDWATER LUBE OIL PUMP, FWP-4B IS RUNNING.
- o INVESTIGATE CAUSE OF PUMP TRIP.

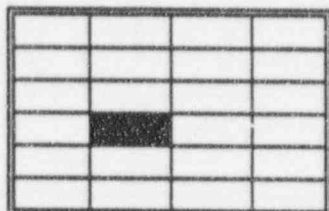
DISCUSSION:

THIS PUMP SUPPLIES BOTH LUBE OIL AND CONTROL OIL TO THE FEED PUMP.

REFERENCES: DRAWING 208-032 SHEET FW-08

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-04	L-02-04
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FWP B
LUBE OIL PUMP
TRIP

EVENT POINT 1447

INDICATED CONDITION:

- o FWP-4B BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON FWP-4B CONTROL STATION.
- o STANDBY FEEDWATER LUBE OIL PUMP FWP-3B, FWP-4B AUTO STARTS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE BACKUP FEEDWATER LUBE OIL PUMP, FWP-3B IS RUNNING.
- o INVESTIGATE CAUSE OF PUMP TRIP.

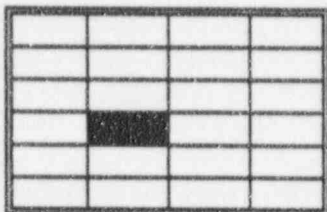
DISCUSSION:

THIS PUMP SUPPLIES BOTH LUBE OIL AND CONTROL OIL TO THE FEED PUMP.

REFERENCES: DRAWING 208-032 SHEET FW-10

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-04	L-02-04
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FWP B
LUBE OIL PUMP
TRIP

EVENT POINT 1453

INDICATED CONDITION:

- o FWP-5B BREAKER IS OPEN WITH THE CONTROL HANDLE IN THE NORMAL AFTER START POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o GREEN LIGHT IS ON WITH A RED FLAG ON FWP-5B CONTROL STATION.
- o STANDBY FEEDWATER LUBE OIL PUMP FWP-3B, FWP-4B AUTO STARTS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE BACKUP FEEDWATER LUBE OIL PUMP, FWP-3B IS RUNNING.
- o IF NO LUBE OIL PUMPS ARE RUNNING, THEN VERIFY THAT FWP-2B IS NOT ROLLING.
- o INVESTIGATE CAUSE OF PUMP TRIP.

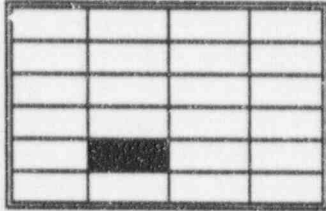
DISCUSSION:

THIS PUMP SUPPLIES ONLY BEARING LUBE OIL TO THE FEED PUMP AND NOT CONTROL OIL.

REFERENCES: DRAWING 208-032 SHEET FW-35

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-05	L-02-05
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FWP B
EMERG OIL PP
AUTO START

EVENT POINT 1452

INDICATED CONDITION:

- 0 FWP-5B BREAKER CLOSED WITH THE CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON FWP-5B CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF AUTO START.
- o VERIFY PROPER LUBE OIL SYSTEM OPERATION.

DISCUSSION:

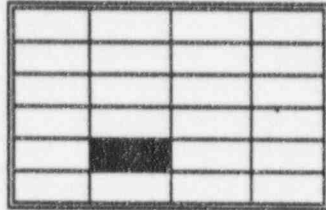
FWP-5B WILL AUTO START WHEN LUBE OIL PRESSURE DROPS TO <12 PSIG.

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-035

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-05	L-02-05
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FWP B
EMERG OIL PP
AUTO START

EVENT POINT 1497

INDICATED CONDITION:

- o FWP-3B BREAKER CLOSED WITH THE CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON FWP-3B CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF AUTO START.
- o VERIFY PROPER LUBE OIL SYSTEM OPERATION.

DISCUSSION:

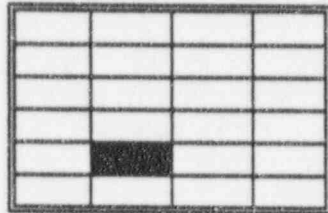
FWP-3B WILL AUTO START WHEN LUBE OIL PRESSURE DROPS TO <18 PSIG OR WHEN CONTROL OIL PRESSURE DROPS TO <90 PSIG.

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-008

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-05	L-02-05
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FWP B
EMERG OIL PP
AUTO START

EVENT POINT 1499

INDICATED CONDITION:

- o FWP-4B BREAKER CLOSED WITH THE CONTROL HANDLE IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON FWP-4B CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INVESTIGATE CAUSE OF AUTO START.
- o VERIFY PROPER LUBE OIL SYSTEM OPERATION.

DISCUSSION:

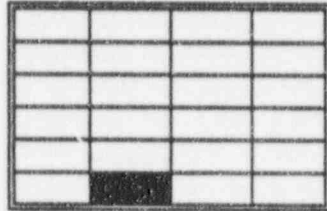
FWP-4B WILL AUTO START WHEN LUBE OIL PRESSURE DROPS TO <18 PSIG OR WHEN CONTROL OIL PRESSURE DROPS TO <90 PSIG.

FEED PUMP WILL TRIP WHEN LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-010

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-06	L-02-06
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FWP B LUBE OIL
RESVR LEVEL
HIGH/LOW

EVENT POINT 1476

INDICATED CONDITION:

- o FEEDWATER PUMP 2B LUBE OIL RESERVOIR LEVEL HIGH AS SENSED BY FW-208-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LO-862 SV CLOSED ON HIGH LEVEL.
- o LOCAL RESERVOIR SIGHT GLASS INDICATION.
- o LOCAL RESERVOIR DIPSTICK LEVEL

OPERATOR ACTIONS FOR A VALID ALARM:

- o CHECK LUBE OIL DRAIN FLOWPATH TO THE LUBE OIL PURIFIER.

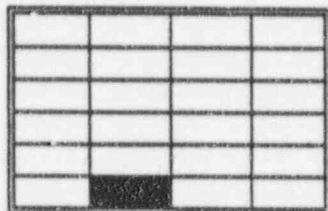
DISCUSSION:

THIS ALARM WILL ACTUATE WHEN OIL LEVEL REACHES 15 INCHES BELOW THE TOP OF THE BOTTOM FLANGE OF THE LEVEL SWITCH.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-208-LS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-02-06	L-02-06
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FWP B LUBE OIL
RESVR LEVEL
HIGH/LOW

EVENT POINT 1477

INDICATED CONDITION:

- o FEEDWATER PUMP 2B LUBE OIL RESERVOIR LEVEL LOW SENSED BY FW-208-LS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL RESERVOIR SIGHT GLASS INDICATION.
- o LUBE OIL SYSTEM PRESSURE INDICATION.
- o LOCAL RESERVOIR DIPSTICK LEVEL.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CHECK LUBE OIL SYSTEM FOR EVIDENCE OF LEAKS.
- o ADD OIL TO LUBE OIL RESERVOIR AS NECESSARY.

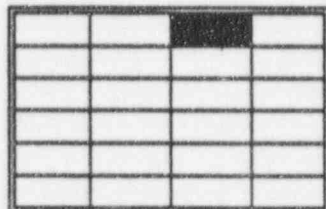
DISCUSSION:

IF A LARGE LUBE OIL LEAK EXISTS, CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE MAIN FEED PUMP. THIS ALARM WILL ACTUATE WHEN OIL LEVEL REACHES 30 INCHES BELOW THE TOP OF THE BOTTOM FLANGE OF THE LEVEL SWITCH.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-208-LS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-01	L-03-01
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FWBP A
TRIP

EVENT POINT 1424

INDICATED CONDITION:

- o FWP-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 FWP-1A CONTROL STATION.
- o FEEDWATER FLOW INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF PLANT IS >55% POWER, THEN REFER TO AP-545.
- o INVESTIGATE CAUSE OF PUMP TRIP.

DISCUSSION:

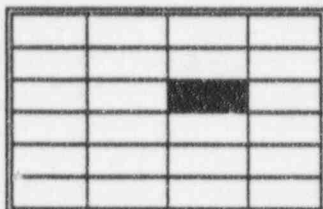
THE FOLLOWING ARE BOOSTER PUMP TRIPS:

LUBE OIL PRESSURE <4 PSIG
DEAERATOR LEVEL <2'10"
ELECTRICAL FAULTS

REFERENCES: DRAWING 208-032 SHEET FW-01

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1434

INDICATED CONDITION:

- o FEEDWATER PUMP 2A AT ZERO SPEED AND TURNING GEAR NOT ENGAGED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2A SHAFT NOT TURNING.
- o GREEN "NOT ENGAGED LIGHT" ON.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENGAGE FEED PUMP TURNING GEAR.

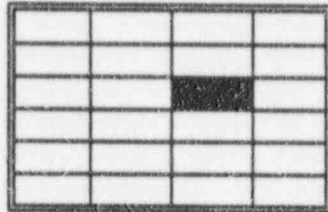
DISCUSSION:

FWP-2A HAS NO AUTOMATIC ENGAGING FOR THE TURNING GEAR. THE TURNING GEAR MUST BE MANUALLY ENGAGED LOCALLY AT THE FEED PUMP. ADMITTING GLAND STEAM TO A MAIN FEEDWATER PUMP TURBINE ROTOR WHILE IT IS STATIONARY MAY CAUSE BOWING OF THE SHAFT DUE TO UNEVEN HEATING.

REFERENCES: DRAWING 208-032 SHEET FW-05

SENSING ELEMENT: TURNING GEAR ENGAGED SWITCH

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1435

INDICATED CONDITION:

- o FEEDWATER PUMP 2B AT ZERO SPEED AND TURNING GEAR NOT ENGAGED.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2B SHAFT NOT TURNING.
- o GREEN "NOT ENGAGED LIGHT" IS ON.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE THE FEED PUMP TURNING GEAR IS ENGAGED.

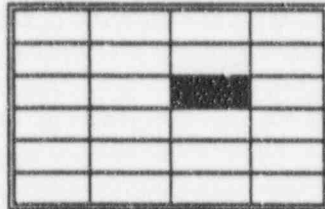
DISCUSSION:

ADMITTING GLAND STEAM TO A MAIN FEEDWATER PUMP TURBINE ROTOR WHILE IT IS STATIONARY MAY CAUSE BOWING OF THE SHAFT DUE TO UNEVEN HEATING.

REFERENCES: DRAWING 208-032 SHEET FW-06

SENSING ELEMENT: TURNING GEAR ENGAGED SWITCH

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1443

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURNING GEAR MOTOR AMPS >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2B TURNING GEAR MOTOR RUNNING HOT.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY FWP-2B NOT RUBBING.
- o CONTACT ELECTRIC SHOP.

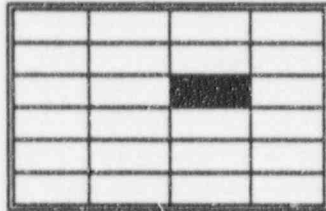
DISCUSSION:

ADMITTING GLAND STEAM TO A MAIN FEEDWATER PUMP TURBINE ROTOR WHILE IT IS STATIONARY MAY CAUSE BOWING OF THE SHAFT DUE TO UNEVEN HEATING.

REFERENCES: DRAWING 208-032 SHEET FW-06

SENSING ELEMENT: TURNING GEAR OVERLOAD CONTACT, 49

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1446

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURNING GEAR MOTOR AMPS >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2A TURNING GEAR MOTOR HOT.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY FWP-2A NOT RUBBING.
- o CONTACT ELECTRIC SHOP.

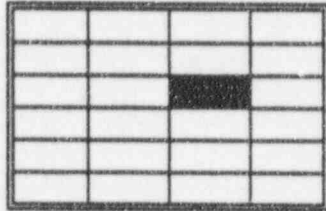
DISCUSSION:

ADMITTING GLAND STEAM TO A MAIN FEEDWATER PUMP TURBINE ROTOR THAT IS STATIONARY MAY CAUSE BOWING OF THE SHAFT DUE TO UNEVEN HEATING.

REFERENCES: DRAWING 208-032 SHEET FW-05

SENSING ELEMENT: TURNING GEAR OVERLOAD CONTACT, 49

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1454

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE EXHAUST PRESSURE >0.0 PSIG AS SENSED BY FW-104-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o MAIN TURBINE VACUUM RECORDER.
- o COMPUTER POINT S-260.
- o LOCAL FEED PUMP VACUUM INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE FEED PUMP.

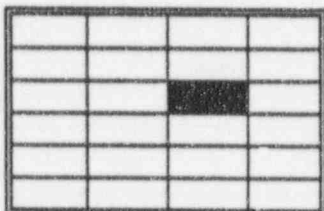
DISCUSSION:

OPERATION OF THE MAIN FEED PUMP AT LOW VACUUM CONDITIONS CAN CAUSE OVERHEATING OF THE TURBINE ROTOR WHICH COULD CAUSE SUBSTANTIAL TURBINE DAMAGE, AND SO SHOULD BE MINIMIZED.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-104-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1458

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE EXHAUST TEMPERATURE $>230^{\circ}$ F AS SENSED BY FW-102-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOW CONDENSER/FEED PUMP VACUUM.
- o COMPUTER POINT X-100.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE FEED PUMP.

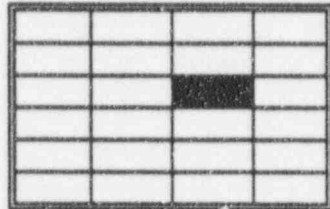
DISCUSSION:

OPERATION OF THE MAIN FEED PUMP AT LOW VACUUM/HIGH EXHAUST TEMPERATURE CONDITIONS CAN CAUSE OVERHEATING OF THE TURBINE ROTOR WHICH COULD CAUSE SUBSTANTIAL TURBINE DAMAGE, AND SO SHOULD BE MINIMIZED.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-102-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1462

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE SPEED $\geq 5,555$ RPM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2A SPEED INDICATION.
- o FWP-2A LOCAL SPEED INDICATOR ON FEED PUMP CONTROL CONSOLE.

OPERATOR ACTIONS FOR A VALID ALARM:

- o TRIP THE FEED PUMP MANUALLY.

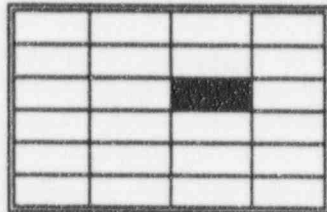
DISCUSSION:

OVERSPEED TRIP OF THE FEED PUMP TURBINE SHOULD OCCUR AT 5,555 RPM.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-163-ST1, FW-163-ST2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1463

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE SPEED <100 RPM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2A SPEED INDICATION.
- o FWP-2A TRIP
- o FWP-2A LOCAL SPEED INDICATOR ON FEED PUMP CONTROL CONSOLE.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INCREASE TURBINE SPEED PRIOR TO RELEASING MISSING SPEED SIGNAL BYPASS START PUSHBUTTON.

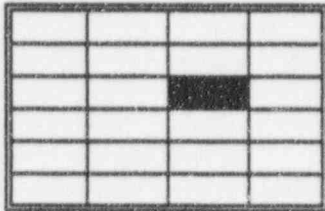
DISCUSSION:

THE FEED PUMP WILL TRIP IF TURBINE SPEED DROPS TO LESS THAN 100 RPM.

REFERENCES: DRAWING 209-032 SHEET FW-045

SENSING ELEMENT: FW-163-ST1, FW-163-ST2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1467

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE SHAFT ECCENTRICITY >2.4 MILS (ALERT) OR >3.5 MILS (DANGER) AS SENSED BY FW-241-MIS2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEED PUMP VIBRATION PANEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF IN ALERT, THEN CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF IN DANGER, THEN REDUCE TURBINE LOAD UNTIL ALARM CLEARS. IF ALARM WILL NOT CLEAR, THEN CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE PUMP.
- o MONITOR FEED PUMP BEARING TEMPERATURES ON PLANT COMPUTER.

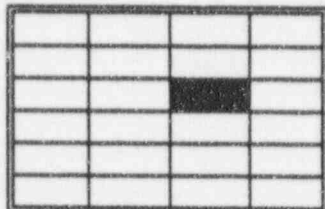
DISCUSSION:

SHAFT ECCENTRICITY IS THE RADIAL MOVEMENT OF THE TURBINE SHAFT CENTERLINE. LARGE MOVEMENTS CAN CAUSE TURBINE BEARING DAMAGE DUE TO METAL TO METAL CONTACT BETWEEN THE TURBINE SHAFT AND THE BEARING SURFACE.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-241-MIS2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1468

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE THRUST BEARING POSITION >10 MILS (ALERT) OR >20 MILS (DANGER) AS SENSED BY FW-237-KIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEED PUMP VIBRATION PANEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF IN ALERT, THEN CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF IN DANGER, THEN REDUCE TURBINE LOAD UNTIL ALARM CLEARS. IF ALARM WILL NOT CLEAR, THEN CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE PUMP.
- o MONITOR FEED PUMP BEARING TEMPERATURES ON THE PLANT COMPUTER.

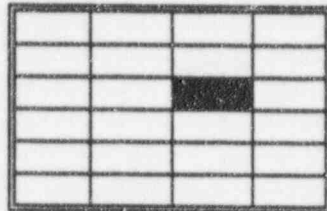
DISCUSSION:

LARGE THRUST BEARING DISPLACEMENT READINGS CAN CAUSE THRUST BEARING DAMAGE.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-237-KIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1470

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE EXHAUST PRESSURE >0.0 PSIG AS SENSED BY FW-105-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o MAIN TURBINE VACUUM RECORDER.
- o COMPUTER POINT S-282.
- o LOCAL FEED PUMP VACUUM INDICATOR.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE FEED PUMP.

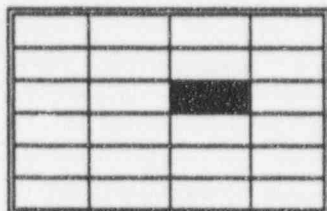
DISCUSSION:

OPERATION OF THE MAIN FEED PUMP AT LOW VACUUM CONDITIONS CAN CAUSE OVERHEATING OF THE TURBINE ROTOR WHICH COULD CAUSE SUBSTANTIAL TURBINE DAMAGE, AND SO SHOULD BE MINIMIZED.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-105-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1474

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE EXHAUST TEMPERATURE >230° F AS SENSED BY FW-103-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOW CONDENSER/FEED PUMP VACUUM.
- o COMPUTER POINT X-102.

OPERATOR ACTIONS FOR A VALID ALARM:

- o CONSIDERATION SHOULD BE GIVEN TO TRIPPING THE FEED PUMP.

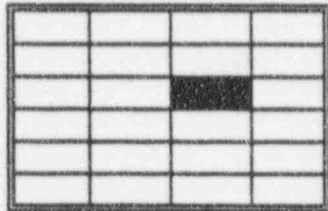
DISCUSSION:

OPERATION OF THE MAIN FEED PUMP AT LOW VACUUM/HIGH EXHAUST TEMPERATURE CONDITIONS CAN CAUSE OVERHEATING OF THE TURBINE ROTOR WHICH COULD CAUSE SUBSTANTIAL DAMAGE TO THE TURBINE AND SO, SHOULD BE MINIMIZED.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-103-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1478

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE SPEED $\geq 5,555$ RPM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2B SPEED INDICATION.
- o FWP-2B LOCAL SPEED INDICATOR ON FEED PUMP CONTROL CONSOLE.

OPERATOR ACTIONS FOR A VALID ALARM:

- o TRIP THE FEED PUMP MANUALLY.

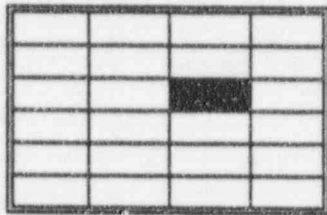
DISCUSSION:

OVERSPEED TRIP OF THE FEED PUMP TURBINE SHOULD OCCUR AT 5,555 RPM.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-169-ST1, FW-169-ST2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1479

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE SPEED <100 RPM.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-2B SPEED INDICATION.
- o FWP-2B TRIP.
- o FWP-2B LOCAL SPEED INDICATOR ON FEED PUMP CONTROL CONSOLE.

OPERATOR ACTIONS FOR A VALID ALARM:

- o INCREASE TURBINE SPEED PRIOR TO RELEASING MISSING SPEED SIGNAL BYPASS START PUSHBUTTON.

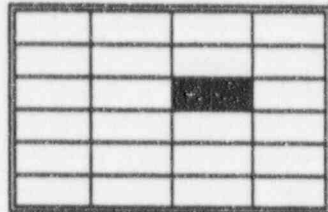
DISCUSSION:

THE FEED PUMP WILL TRIP IF TURBINE SPEED DROPS TO LESS THAN 100 RPM.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-169-ST1, FW-169-ST2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1483

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE SHAFT ECCENTRICITY >2.4 MILS (ALERT) OR >3.5 MILS (DANGER) AS SENSED BY FW-242-MIS2.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEED PUMP VIBRATION PANEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF IN ALERT, THEN CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF IN DANGER, THEN REDUCE TURBINE LOAD UNTIL ALARM CLEARS. IF ALARM WILL NOT CLEAR, THEN CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE PUMP.
- o MONITOR FEED PUMP BEARING TEMPERATURES ON THE PLANT COMPUTER.

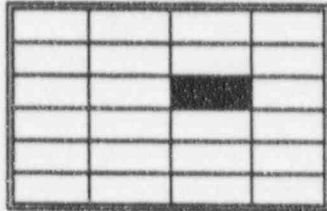
DISCUSSION:

SHAFT ECCENTRICITY IS THE RADIAL MOVEMENT OF THE TURBINE SHAFT CENTERLINE. LARGE MOVEMENTS CAN CAUSE TURBINE BEARING DAMAGE DUE TO METAL TO METAL CONTACT BETWEEN THE TURBINE SHAFT AND THE BEARING SURFACE.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-242-MIS2

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1484

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE THRUST BEARING POSITION >10 MILS (ALERT) OR >20 MILS (DANGER) AS SENSED BY FW-238-KIS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FEED PUMP VIBRATION PANEL INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF IN ALERT, THEN CONTACT ENGINEERING FOR RECOMMENDATIONS FOR FURTHER PUMP OPERATION.
- o IF IN DANGER, THEN REDUCE TURBINE LOAD UNTIL ALARM CLEARS. IF ALARM WILL NOT CLEAR, THEN CONSIDERATION SHOULD BE GIVEN TO SHUTTING DOWN THE PUMP.
- o MONITOR FEED PUMP BEARING TEMPERATURES ON PLANT COMPUTER.

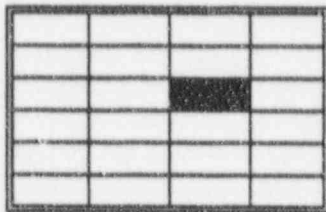
DISCUSSION:

LARGE THRUST BEARING DISPLACEMENT READINGS CAN CAUSE THRUST BEARING DAMAGE.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-238-KIS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1488

INDICATED CONDITION:

- o FWP-5A MOTOR AMPS >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-5A RUNNING HOT.

OPERATOR ACTIONS FOR A VALID ALARM:

- o START NORMAL DUTY LUBE OIL PUMP, FWP-3A OR FWP-4A, AND SECURE FWP-5A.

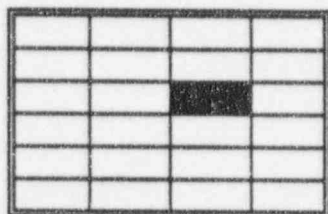
DISCUSSION:

EMERGENCY LUBE OIL PUMP, FWP-5A SUPPLIES BEARING LUBE OIL ONLY AND NOT CONTROL OIL.

REFERENCES: DRAWING 208-032 SHEET FW-034

SENSING ELEMENT: FWP-5A OVERLOAD RELAY, 49

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1489

INDICATED CONDITION:

- o FWP-5B MOTOR AMPS >115% RATED LOAD.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-5B RUNNING HOT.

OPERATOR ACTIONS FOR A VALID ALARM:

- o START NORMAL DUTY LUBE OIL PUMP, FWP-3B OR FWP-4B AND SECURE FWP-5B.

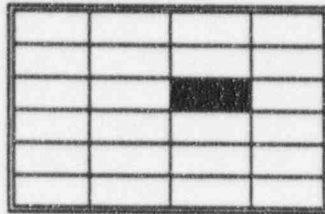
DISCUSSION:

EMERGENCY LUBE OIL PUMP, FWP-5B SUPPLIES BEARING OIL ONLY AND NOT CONTROL OIL.

REFERENCES: DRAWING 208-032 SHEET FW-035

SENSING ELEMENT: FWP-5B OVERLOAD RELAY, 49

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1490

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TACHOMETER SELECT AND TEST SWITCH NOT IN NORMAL

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o WHITE TRIP "BLOCK" LIGHT IS ON, LOCATED ON THE FWP-2A LOCAL CONTROL PANEL ON.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY FEEDWATER PUMP TESTING IS IN PROGRESS.
- o PLACE "TACHOMETER SELECT AND TEST" SWITCH BACK TO NORMAL.

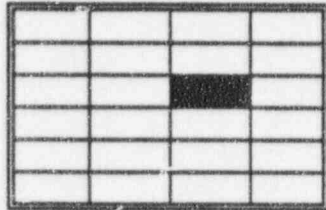
DISCUSSION:

THIS ALARM INDICATES THAT THE FEED PUMP TEST SWITCH IS IN THE TEST POSITION. THIS BLOCKS ALL TRIPS TO THE MAIN FEED PUMP.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-139-PS AND FW-141-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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**FWP
TROUBLE**

EVENT POINT 1491

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TACHOMETER SELECT AND TEST SWITCH NOT IN NORMAL

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o WHITE TRIP "BLOCK" LIGHT IS ON, LOCATED ON THE FWP-2B LOCAL CONTROL PANEL ON.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY FEEDWATER PUMP TESTING IS IN PROGRESS.
- o PLACE "TACHOMETER SELECT AND TEST" SWITCH BACK TO NORMAL.

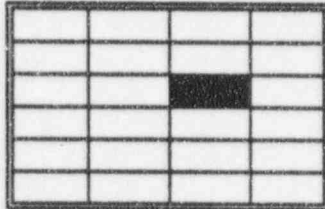
DISCUSSION:

THIS ALARM INDICATES THAT THE FEED PUMP TEST SWITCH IS IN THE TEST POSITION. THIS BLOCKS ALL TRIPS TO THE MAIN FEED PUMP.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-140-PS AND FW-142-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1494

INDICATED CONDITION:

- o FEEDWATER PUMP 2A LUBE OIL FILTER DIFFERENTIAL PRESSURE >20 PSID AS SENSED BY FW-201-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL DIFFERENTIAL PRESSURE INDICATOR.
- o LUBE OIL PRESSURE LOW.

OPERATOR ACTIONS FOR A VALID ALARM:

- o SWAP FWP-2A LUBE OIL FILTERS.

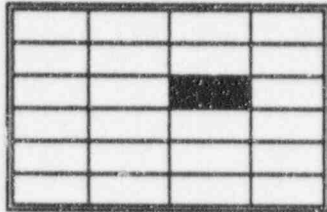
DISCUSSION:

MAXIMUM DIFFERENTIAL PRESSURE ACROSS FEEDWATER PUMP LUBE OIL FILTER IS 20 PSID. THIS IS TO PROTECT THE FILTERS FROM MECHANICAL DAMAGE DUE TO HIGH DIFFERENTIAL PRESSURES. INTERNAL RELIEF VALVE LIFTS AT 20 PSID.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-201-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-03	L-03-03
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FWP
TROUBLE

EVENT POINT 1495

INDICATED CONDITION:

- o FEEDWATER PUMP 2B LUBE OIL FILTER DIFFERENTIAL PRESSURE >20 PSID AS SENSED BY FW-202-PS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL DIFFERENTIAL PRESSURE INDICATOR.
- o LUBE OIL PRESSURE LOW.

OPERATOR ACTIONS FOR A VALID ALARM:

- o SWAP FWP-2B LUBE OIL FILTERS.

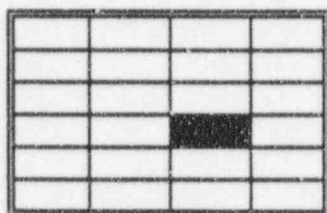
DISCUSSION:

MAXIMUM DIFFERENTIAL PRESSURE ACROSS FEEDWATER PUMP LUBE OIL FILTER IS 20 PSID. THIS IS TO PROTECT THE FILTERS FROM MECHANICAL DAMAGE DUE TO HIGH DIFFERENTIAL PRESSURES. INTERNAL RELIEF VALVE LIFTS AT 20 PSID.

REFERENCES: DRAWING 208-032 SHEET FW-045

SENSING ELEMENT: FW-202-PS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-04	L-03-04
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FWP BRG OIL
DRAIN TEMP
HIGH

EVENT POINT 1456

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE BEARING #1 LUBE OIL DRAIN TEMPERATURE >170° F. AS SENSED BY FW-143-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL FEEDWATER PUMP BEARING TEMPERATURE INDICATORS.
- o FEEDWATER PUMP 2A COMPUTER GROUP 89.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER COOLING WATER FLOW.
- o CONTACT ENGINEERING CONCERNING CONTINUED FEEDWATER PUMP OPERATION.
- o CONSIDERATION SHOULD BE GIVEN TO REDUCING FEEDWATER PUMP LOAD.

DISCUSSION:

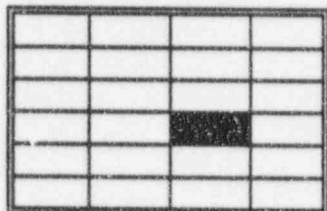
MAXIMUM BEARING OIL OUTLET TEMPERATURE IS 175° F TO PREVENT BREAKDOWN IN LUBE OIL VISCOSITY THAT COULD LEAD TO BEARING DAMAGE.

MAXIMUM BEARING TEMPERATURE IS 200° F.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-143-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-04	L-03-04
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FWP BRG OIL
DRAIN TEMP
HIGH

EVENT POINT 1457

INDICATED CONDITION:

- o FEEDWATER PUMP 2A TURBINE BEARING #2 LUBE OIL DRAIN TEMPERATURE >170° F. AS SENSED BY FW-144-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL FEEDWATER PUMP BEARING TEMPERATURE INDICATORS.
- o FEEDWATER PUMP 2A COMPUTER GROUP 89.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE PROPER COOLING WATER FLOW.
- o CONTACT ENGINEERING CONCERNING CONTINUED FEEDWATER PUMP OPERATION.
- o CONSIDERATION SHOULD BE GIVEN TO REDUCING FEEDWATER PUMP LOAD.

DISCUSSION:

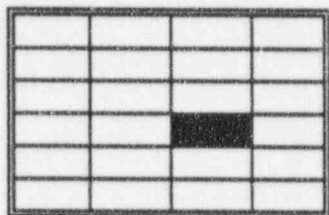
MAXIMUM BEARING OIL OUTLET TEMPERATURE IS 175° F TO PREVENT BREAKDOWN IN LUBE OIL VISCOSITY THAT COULD LEAD TO BEARING DAMAGE.

MAXIMUM BEARING TEMPERATURE IS 200° F.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-144-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-04	L-03-04
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**FWP BRG OIL
DRAIN TEMP
HIGH**

EVENT POINT 1472

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE BEARING #1 LUBE OIL DRAIN TEMPERATURE >170° F. AS SENSED BY FW-145-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL FEEDWATER PUMP BEARING TEMPERATURE INDICATORS.
- o FEEDWATER PUMP 2B COMPUTER GROUP 90.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE PROPER COOLING WATER FLOW.
- o CONTACT ENGINEERING CONCERNING CONTINUED FEEDWATER PUMP OPERATION.
- o CONSIDERATION SHOULD BE GIVEN TO REDUCING FEEDWATER PUMP LOAD.

DISCUSSION:

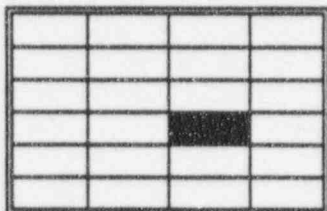
MAXIMUM BEARING OIL OUTLET TEMPERATURE IS 175° F TO PREVENT BREAKDOWN IN LUBE OIL VISCOSITY THAT COULD LEAD TO BEARING DAMAGE.

MAXIMUM BEARING TEMPERATURE IS 200° F.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-145-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-04	L-03-04
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FWP BRG OIL
DRAIN TEMP
HIGH

EVENT POINT 1473

INDICATED CONDITION:

- o FEEDWATER PUMP 2B TURBINE BEARING #2 LUBE OIL DRAIN TEMPERATURE >170° F. AS SENSED BY FW-146-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL FEEDWATER PUMP BEARING TEMPERATURE INDICATORS.
- o FEEDWATER PUMP 2B COMPUTER GROUP 90.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER COOLING WATER FLOW.
- o CONTACT ENGINEERING CONCERNING CONTINUED FEEDWATER PUMP OPERATION.
- o CONSIDERATION SHOULD BE GIVEN TO REDUCING FEEDWATER PUMP LOAD.

DISCUSSION:

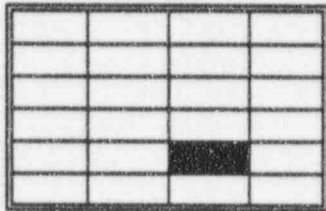
MAXIMUM BEARING OIL OUTLET TEMPERATURE IS 175° F TO PREVENT BREAKDOWN IN LUBE OIL VISCOSITY THAT COULD LEAD TO BEARING DAMAGE.

MAXIMUM BEARING TEMPERATURE IS 200° F.

REFERENCES: DRAWING 208-032 SHF FW-45

SENSING ELEMENT: FW-146-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-05	L-03-05
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FWP OIL CLR
OUTLET TEMP
HIGH

EVENT POINT 1459

INDICATED CONDITION:

- o FEEDWATER PUMP 2A LUBE OIL COOLER OUTLET TEMPERATURE $>140^{\circ}$ F. AS SENSED BY FW-211-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL FEEDWATER PUMP LUBE OIL COOLER OUTLET TEMPERATURE INDICATORS.
- o FEEDWATER PUMP 2A COMPUTER GROUP 89.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER COOLING WATER FLOW.
- o CONTACT ENGINEERING CONCERNING CONTINUED FEEDWATER PUMP OPERATION.
- o CONSIDERATION SHOULD BE GIVEN TO REDUCING FEEDWATER PUMP LOAD.

DISCUSSION:

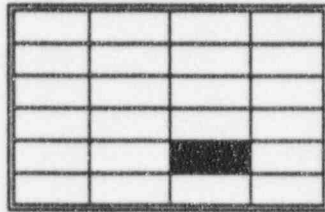
MAXIMUM BEARING OIL OUTLET TEMPERATURE IS 175° F TO PREVENT BREAKDOWN IN LUBE OIL VISCOSITY THAT COULD LEAD TO BEARING DAMAGE.

MAXIMUM BEARING TEMPERATURE IS 200° F.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-211-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-05	L-03-05
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FWP OIL CLR
OUTLET TEMP
HIGH

EVENT POINT 1475

INDICATED CONDITION:

- o FEEDWATER PUMP 2B LUBE OIL COOLER OUTLET TEMPERATURE >140° F. AS SENSED BY FW-212-TS.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL FEEDWATER PUMP LUBE OIL COOLER OUTLET TEMPERATURE INDICATORS.
- o FEEDWATER PUMP 2B COMPUTER GROUP 90.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER COOLING WATER FLOW.
- o CONTACT ENGINEERING CONCERNING CONTINUED FEEDWATER PUMP OPERATION.
- o CONSIDERATION SHOULD BE GIVEN TO REDUCING FEEDWATER PUMP LOAD.

DISCUSSION:

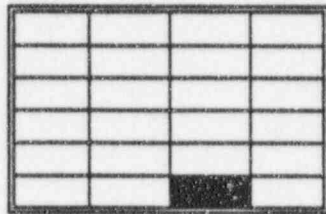
MAXIMUM BEARING OIL OUTLET TEMPERATURE IS 175° F TO PREVENT BREAKDOWN IN LUBE OIL VISCOSITY THAT COULD LEAD TO BEARING DAMAGE.

MAXIMUM BEARING TEMPERATURE IS 200° F.

REFERENCES: DRAWING 208-032 SHEET FW-45

SENSING ELEMENT: FW-212-TS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-06	L-03-06
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(MSV-53/
MSV-54)
NOT FULL OPEN

EVENT POINT 0941

INDICATED CONDITION:

- o TURBINE BYPASS ISOLATION VALVE MSV-53, NOT FULL OPEN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o MSV-53 POSITION INDICATION.
- o LOCAL POSITION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o DETERMINE REQUIREMENT FOR MSV-53 NOT BEING FULL OPEN.
- o OPEN MSV-53.

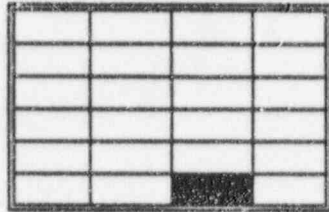
DISCUSSION:

MSV-53 ISOLATES STEAM GENERATOR "A" TURBINE BYPASS VALVES (MSV-9, MSV-10) AND THE FWP-2A HP STEAM SUPPLY.

REFERENCES: DRAWING 208-039 SHEET MS-01

SENSING ELEMENT: 33 O VALVE OPEN CONTACT

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-03-06	L-03-06
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(MSV-53/
MSV-54)
NOT FULL OPEN

EVENT POINT 0942

INDICATED CONDITION:

- o TURBINE BYPASS ISOLATION VALVE MSV-54, NOT FULL OPEN.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o MSV-54 POSITION INDICATION.
- o LOCAL POSITION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o DETERMINE REQUIREMENT FOR MSV-54 NOT BEING FULL OPEN.
- o OPEN MSV-54.

DISCUSSION:

MSV-54 ISOLATES STEAM GENERATOR "B" TURBINE BYPASS VALVES (MSV-11, MSV-14) AND THE FWP-2B HP STEAM SUPPLY.

REFERENCES: DRAWING 208-039 SHEET MS-02

SENSING ELEMENT: 33 O VALVE OPEN CONTACT

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-J1	L-04-01
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FWBP B
TRIP

EVENT POINT 1425

INDICATED CONDITION:

- o FWP-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 FWP-1B CONTROL STATION.
- o FEEDWATER FLOW INDICATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o IF REACTOR POWER IS >55% RTP, THEN REFER TO AP-545.
- o INVESTIGATE CAUSE OF PUMP TRIP.

DISCUSSION:

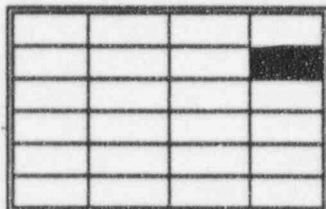
THE FOLLOWING ARE BOOSTER PUMP TRIPS:

LUBE OIL PRESSURE <4 PSIG
DEAERATOR LEVEL <2'10"
ELECTRICAL FAULTS

REFERENCES: DRAWING 208-032 SHEET FW-02

SENSING ELEMENT: CONTROL SWITCH AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-02	L-04-02
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**FWBP
MOTOR
OVERLOAD**

EVENT POINT 1486

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-1A CURRENT INDICATOR.
- o FEEDWATER FLOW INDICATION.
- o FWP-1A TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o REDUCE FEEDWATER FLOW.
- o HAVE BREAKER CHECKED FOR DROPPED TARGETS.

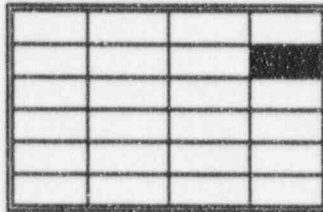
DISCUSSION:

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

REFERENCES: DRAWING 208-032 SHEET FW-01

SENSING ELEMENT: BREAKER OVER CURRENT RELAYS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-02	L-04-02
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**FWBP
MOTOR
OVERLOAD**

EVENT POINT 1487

INDICATED CONDITION:

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

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o FWP-1B CURRENT INDICATOR.
- o FEEDWATER FLOW INDICATION.
- o FWP-1B TRIPS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o REDUCE FEEDWATER FLOW.
- o HAVE BREAKER CHECKED FOR DROPPED TARGETS.

DISCUSSION:

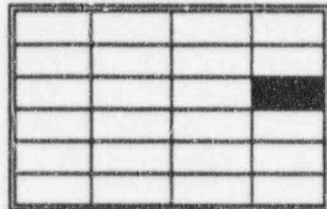
THIS ALARM INDICATES THAT EITHER THE TIMED OVERCURRENT OR THE INSTANTANEOUS OVERCURRENT PROTECTIVE DEVICES HAVE ACTUATED. INSTANTANEOUS OVERCURRENT PROTECTIVE RELAY ACTUATION WILL TRIP THE BREAKER.

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

REFERENCES: DRAWING 208-032 SHEET FW-02

SENSING ELEMENT: BREAKER OVER CURRENT RELAYS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-03	L-04-03
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FWP
LUBE OIL PUMP
TRIP

EVENT POINT 1426

INDICATED CONDITION:

- o FWP-6A 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 FWP-6A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE FWP-1A LUBE OIL PRESSURE NORMAL.
- o INVESTIGATE CAUSE OF PUMP TRIP.

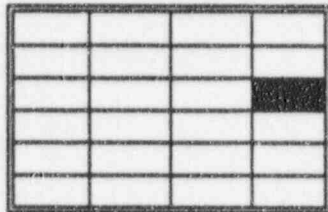
DISCUSSION:

THE BOOSTER PUMP HAS A SHAFT DRIVEN LUBE OIL PUMP THAT SUPPLIES OIL PRESSURE WHILE THE BOOSTER PUMP IS RUNNING.

REFERENCES: DRAWING 208-032 SHEET FW-03

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-03	L-04-03
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FWBP
LUBE OIL PUMP
TRIP

EVENT POINT 1427

INDICATED CONDITION:

- o FWP-6B 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 FWP-6B CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o ENSURE FWP-1B LUBE OIL PRESSURE NORMAL.
- o INVESTIGATE CAUSE OF PUMP TRIP.

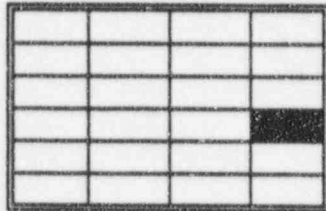
DISCUSSION:

THE BOOSTER PUMP HAS A SHAFT DRIVEN LUBE OIL PUMP THAT SUPPLIES OIL PRESSURE WHILE THE BOOSTER PUMP IS RUNNING.

REFERENCES: DRAWING 208-032 SHEET FW-04

SENSING ELEMENT: BREAKER AND CONTROL SWITCH CONTACTS.

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-04	L-04-04
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FWBP
LUBE OIL PUMP
AUTO START

EVENT POINT 1428

INDICATED CONDITION:

- o FWP-6A BREAKER CLOSED WITH THE CONTROL STATION IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON THE FWP-6A CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER FEEDWATER BOOSTER PUMP OIL PRESSURE.
- o VERIFY PROPER FEEDWATER BOOSTER PUMP LUBE OIL RESERVOIR LEVEL.

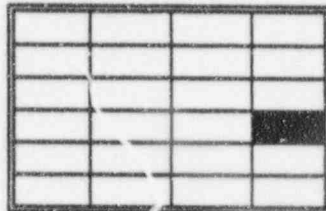
DISCUSSION:

FWP-6A WILL AUTO START IF FWP-1A LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-03

SENSING ELEMENT: CONTROL STATION AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-04	L-04-04
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FWBP
LUBE OIL PUMP
AUTO START

EVENT POINT 1429

INDICATED CONDITION:

- o FWP-6B BREAKER CLOSED WITH THE CONTROL STATION IN THE NORMAL AFTER STOP POSITION.

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o RED LIGHT IS ON WITH A GREEN FLAG ON THE FWP-6B CONTROL STATION.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY PROPER FEEDWATER BOOSTER PUMP OIL PRESSURE.
- o VERIFY PROPER FEEDWATER BOOSTER PUMP LUBE OIL RESERVOIR LEVEL.

DISCUSSION:

FWP-6B WILL AUTO START IF FWP-1B LUBE OIL PRESSURE DROPS TO <5 PSIG.

REFERENCES: DRAWING 208-032 SHEET FW-04

SENSING ELEMENT: CONTROL STATION AND BREAKER CONTACTS

ICS-L ANNUNCIATOR RESPONSE	ICS-CY4-04-05	L-04-05
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FWP
SEAL POT LEVEL
LOW

EVENT POINT 1252

INDICATED CONDITION:

- o MAIN FEEDWATER PUMP SEAL DRAIN RETURN POT LEVEL $< 7 \frac{3}{8}$ " AS SENSED BY GW-36-LS

REDUNDANT INDICATION WHICH WILL VERIFY ALARM:

- o LOCAL DRAIN POT SIGHTGLASS.

OPERATOR ACTIONS FOR A VALID ALARM:

- o VERIFY DRAIN POT LEVEL CONTROL VALVE, GWV-6 IS CLOSED, IF NOT, CONSIDERATION SHOULD BE GIVEN TO ISOLATING GWV-6 BY CLOSING EITHER GWV-33 OR GWV-34 AND CONTROLLING DRAIN POT LEVEL USING GWV-6 BYPASS VALVE GWV-35.

DISCUSSION:

A LOSS OF LEVEL IN THE DRAIN POT CAN LEAD TO A LOSS OF MAIN CONDENSER VACUUM.

REFERENCES: DRAWING 208-034 SHEET GW-04

SENSING ELEMENT: GW-36-LS