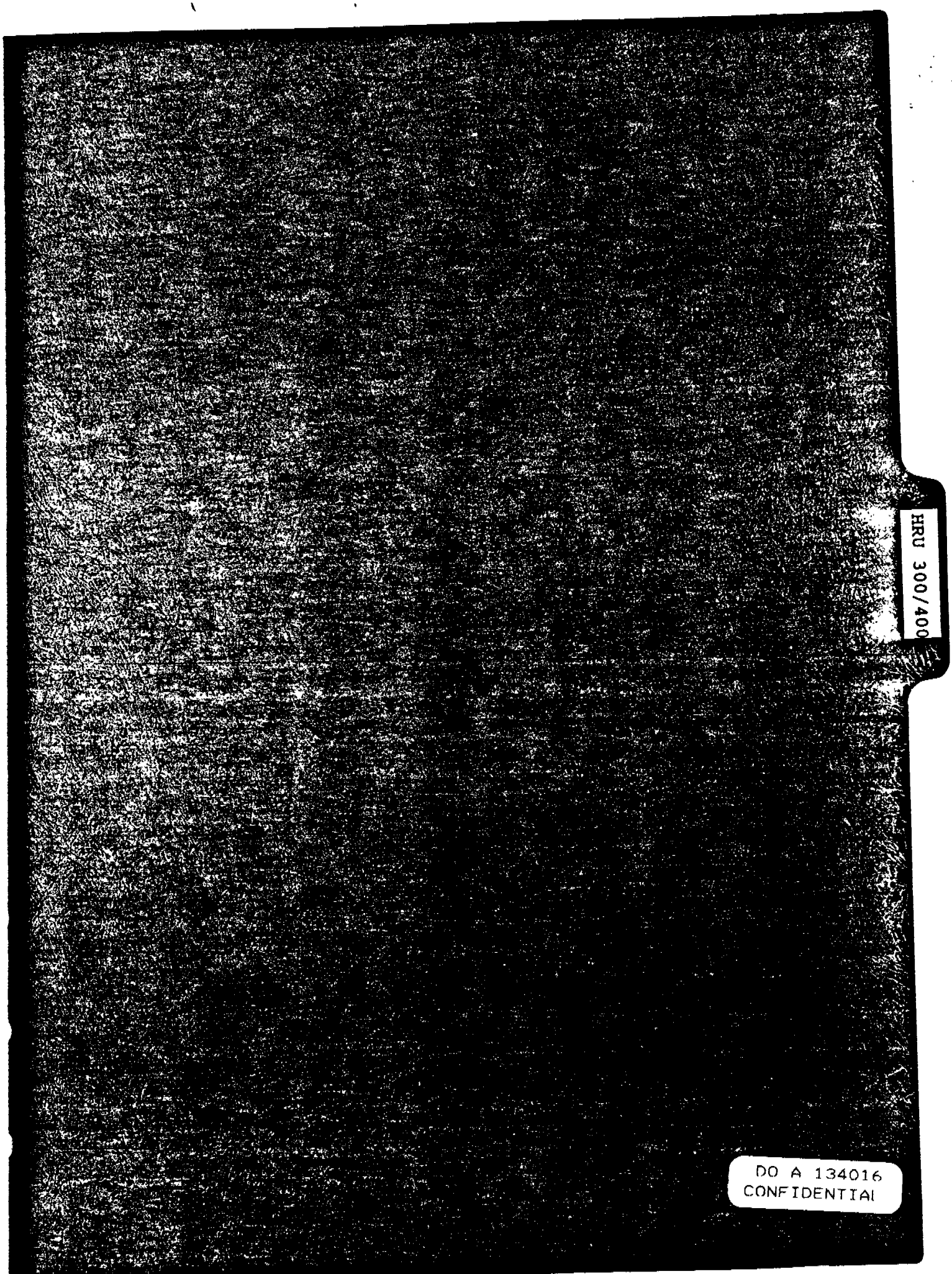
HRU 300/400
DO A 134016
CONFIDENTIAL

HRU 300/400 HYDRO TEST OF L.P. BOILER AT 40#

NOTE: GAS TURBINE IS DOWN, BFP'S ARE TAGGED ELECTRICALLY AND CONDENSATE HEADER IS PRESSURED UP.

A. THE FOLLOWING VENTS MUST BE OPEN:

1. L.P. DRUM VENTS
2. L.P. SUPERHEATER VENTS
3. L.P. VENT BETWEEN NON RETURN AND LEAD LINE OPEN (IN CASE NON-RETURN LEAKS THROUGH).

B. THE FOLLOWING VALVES MUST BE CLOSED PRIOR TO FILLING L.P. BOILER:

1. UPSTREAM WARM UP BLOCK VALVE AROUND LEAD LINE BLOCK VALVE.
2. ALL L.P. BOILER DRAINS.
3. L. P. SUPERHEATER DRAINS.
4. CONTINUOUS BLOWDOWN FROM M.P. BOILER.
5. CONTINUOUS BLOWDOWN FROM L.P. BOILER TO FLASH TANK.
6. M.P. DISCHARGE ON BFP'S.
7. L.P. NON-RETURN
8. L.P. LEAD LINE

C. IN ORDER TO FILL FOR HYDRO, THE FOLLOWING MUST BE DONE:

1. CLOSE BLEEDS ON CONDENSATE FILL HEADER TO M.P. FEEDWATER STATION.

2. HAVE BOARD OPERATOR INSURE THAT THE M.P. FEEDWATER MOV, M.P. MOV BPYASS AND M.P. FEEDWATER REGULATOR ARE CLOSED.

3. OPEN BV'S UPSTREAM AN DOWNSTREAM OF SPOOL PIECE AND L.P. FEEDWATER REGULATOR. THEN HAVE BOARD OPERATOR OPEN LP FEED H2O REG TO ESTABLISH FLOW TO BOILER.

   NOTE: BOILER SHOULD BE FILLING AT THIS TIME.

4. WHEN DRUM LEVEL STARTS TO RISE, SEND AN OPERATOR TO THE TOP OF THE BOILER.
5. WHEN WATER BEGINS COMING OUT OF THE DRUM VENTS, CLOSE DRUM VENTS.

6. CONTINUE TO FILL UNTIL YOU GET WATER OUT OF THE SUPERHEATER VENT. ONCE YOU GET OUT OF SUPERHEATER VENTS, HAVE BOARD OPERATOR CLOSE FEED WATER REGULATOR. THEN CLOSE SUPERHEATER VENT. AFTER YOU HAVE FINISHED CLOSING SUPERHEATER VENT, GO TO LP FEED WATER REGULATOR AND CRACK BYPASS PAYING CLOSE ATTENTION TO GAUGE ON LOW PRESSURE ON LOW PRESSURE DRUM. BRING PRESSURE UP TO 40# USING USING BYPASS THEN BLOCK BYPASS IN FOR INSPECTION.

7. AFTER INSPECTION OF L.P. BOILER AND IF NO LEAKS ARE FOUND, DE-PRESSURE AND DRAIN THE BOILER AND PREPARE THE BOILER FOR START UP. DOUBLE BLOCK AND BLEED HYDRO HEADER.

   NOTE: OPEN THE SUPERHEATER VENTS AND DRAIN TO INSURE THE SUPERHEATER IS COMPLETELY DRAINED BEFORE START UP.

   NOTE: CAUTION IS TO BE TAKEN NOT TO LIFT THE SAFETY WHILE HYDDROING THIS BOILER.

EDITED: JML
07/03/91
BLOCK #13

UPDATED: JML
11/15/92

HRU-300/400 STARTUP

HRU START (COLD) - UNIT 300/400

THIS PROCEDURE IS WRITTEN WITH THE FOLLOWING ASSUMPTIONS:

1. BFP IS READY TO START.
2. 1250# STEAM LINE TO POWER I IS PRESSURED UP AND WARMED.
3. POWER I HAS BEEN NOTIFIED THAT HRU IS BEING STARTED.

PROCEDURE:

1. HIGH, MEDIUM AND LOW PRESSURE BOILER
   A. OPEN LEAD LINE AND NON-RETURN BLOCK VALVES ON HIGH PRESSURE AND RED TAG ELECTROMATIC SAFETY VALVE LEAD LINE.
   B. OPEN DRUM VENTS (2)
   C. OPEN VENT ON SUPERHEATER OUTLET LINE BEFORE NON-RETURN.
   D. OPEN VENT ON SUPERHEATER OUTLINE LINE BETWEEN NON-RETURN AND 1250# BLOCK VALVE.
2. PUT DA LEVEL CONTROLLER IN MANUAL AND ESTABLISH MINIMUM FLOW TO DA (LET DA OVERFLOW DURING START-UP) WITH CORTROL PUMP RUNNING.
3. START BOILER FEED PUMP AND ESTABLISH MINIMUM WATER LEVEL IN EACH BOILER (HP, MP, LP)
4. PUT FEEDWATER DRUM LEVEL CONTROL ON MANUAL AND ESTABLISH TRICKLE FEED TO BOILERS CONTROLLING LEVEL WITH BLOWDOWN VALVES.
5. PHOSPHATE AND CORTROL TANKS SHOULD BE CHECKED FOR ADEQUATE LEVEL INSURING THAT SUCTION AND DISCHARGE VALVES ARE OPEN. START PO4 PUMPS.
6. AS UNITS BEGIN TO HEAT UP, OPEN MANUAL BLOWDOWNS TO MAINTAIN DRUM LEVELS BELOW HALF FULL. PUT FEEDWATER REGULATORS ON AUTOMATIC WHEN BOILERS BEGIN TO GENERATE STEAM.
7. CLOSE ALL VENTS AND DRAINS WHEN STEAM FLOW IS ESTABLISHED.
8. SET UP CONTINUOUS BLOWDOWN SYSTEM ON ALL BOILERS.

DO A 134018
CONFIDENTIAL

HRU START-UP (HOT)

1. PRIOR TO START-UP, BLOWDOWN DRUM LEVELS TO JUST BELOW GAUGE GLASSES (FIRING LEVEL).
2. ESTABLISH TRICKLE FEED FLOW TO BOILERS AND CONTROL LEVELS WITH BLOWDOWNS.
3. FEEDWATER REGULATIONS SHOULD CONTROL DRUM LEVELS ON "AUTO". AFTER BOILERS START STEAMING, ADJUST BLOWDOWNS AS NECESSARY TO PREVENT HIGH DRUM LEVEL.
4. CLOSE ALL VENTS AND DRAINS WHEN STEAM FLOW IS ESTABLISHED.

REVISED: JML
11/03/92
BLOCK #26

TEXT BLOCK # 27

SAFE WORK PROCEDURE

START-UP CHECK LIST - HRU 300/400

HEAT RECOVERY UNIT START-UP

		YES	NO
1.	GAS TURBINE READY FOR START-UP.	____	____
2.	ALL RED TAG MASTERS RELEASED AND EQUIPMENT READY TO GO.	____	____
3.	ALL BOILER ENTRANCES CLOSED AND TIGHTENED.	____	____
4.	COOLING WATER TO ALL EQUIPMENT READY TO GO.	____	____
5.	BOILER FEED PUMPS READY FOR SERVICE.	____	____
6.	CHEMICAL DRUM CHARGED. PO4 LINE UNBLOCKED.	____	____
7.	FEEDWATER REGULATORS UNBLOCKED AND READY TO GO.	____	____
8.	FEEDWATER FLOW TO DA AND OVERFLOWING.	____	____
9.	FUEL GAS UNBLOCKED AND PURGED.	____	____
10.	STEAM LINES WARMING, LEAD LINE DRAINS CRACKED OPEN.	____	____
11.	SUPERHEATER DRAINS (MP & HP) CRACKED OPEN.	____	____
12.	ALL PRESSURE AND LEVEL INDICATORS AND TRANSMITTERS UNBLOCKED.	____	____
13.	CORTROL SYSTEM IN SERVICE.	____	____
14.	BOILER DRUM LEVEL ESTABLISHED.	____	____
15.	ELECTROMATIC RELIEF VALVE MANUALLY BLOCKED AND RED TAGGED.	____	____

REVISED: JML
10/29/91
BLOCK #27

DO A 134020
CONFIDENTIAL

SAFE WORK PROCEDURE

SHUTDOWN OF HEAT RECOVERY UNIT - HRU 300/400

CONDITIONS:

1. GAS TURBINE AND BOILER FEED PUMPS HAVE BEEN SHUT DOWN.

PROCEDURE:

1. OPEN HIGH PRESSURE AND MEDIUM PRESSURE SUPERHEATER DRAINS (BEFORE GAS TURBINE IS SHUT DOWN IF POSSIBLE).
2. CRACK OPEN SUPERHEATER VENTS AND STEAM LINE VENTS.
3. SHUT DOWN PO4 AND CORTROL PUMPS AND BLOCK DISCHARGE.
4. BLOCK STEAM TO DEAERATOR (IF DOWN FOR OVERHAUL).
5. FOLLOW GAS TURBINE COOL DOWN PROCEDURE.

NOTE: DO NOT LET BOILER LEVELS (ESPECIALLY HIGH PRESS. AND MED. PRESS.) GET ABOVE 80%. LET BOILERS GO EMPTY RATHER THAN ALLOW TO OVERFLOW (NO DAMAGE WILL OCCUR FROM LETTING A BOILER GO EMPTY AFTER TURBINE HAS BEEN SHUTDOWN).

REVISED: JML
11/03/92
BLOCK #28

DO A 134021
CONFIDENTIAL

SAFE WORK PROCEDURE

HYDROSTATIC TESTING FEEDWATER PREHEATER - HRU 300/400

CONDITIONS:

1. GAS TURBINE IS DOWN.

PROCEDURE:

1. BLOCK IN DEAERATOR LEVEL CONTROL VALVE AND BY-PASS.
2. BLOCK IN ROTOR AND CONDENSATE TEMPERATURE CONTROL VALVE AND BY-PASS
3. CLOSE ALL PREHEATER DRAIN VALVES (8 TO EACH SECTION).
4. OPEN 8" BLOCK VALVE ON CONDENSATE HEADER FROM POWER 1.
5. OPEN ALL VENTS ON EACH SECTION (6). FILL PREHEATER WITH CONDENSATE UNTIL CONDENSATE OVERFLOWS VENTS.
6. CLOSE ALL VENTS.
7. PRESSURE UP PREHEATER USING CONDENSATE HEADER PRESSURE.

REVISED JNI
9/11/90
BLOCK #29

UPDATED JNI
08/30/93

DO A 134022
CONFIDENTIAL

TEXT BLOCK # 30

HRU 300/400 HYDRO TEST HP BOILER

NOTE: CONDITION OF UNIT IS DOWN. BOILER FEED PUMPS TAGGED ELECTRICALLY. CONDENSATE HEADER PRESSURED UP.

A. THE FOLLOWING VENTS MUST BE OPEN.

1. HP DRUM VENT.
2. HP SUPERHEATER VENT.
3. LEAD LINE VENT BETWEEN NON RETURN AND LEAD LINE MOV.

B. THE FOLLOWING VALVES MUST BE CLOSED BEFORE STARTING TO FILL THE BOILER.

1. UPSTREAM WARM-UP AROUND LEAD LINE MOV
2. ECONOMIZER DRAINS
3. SUPERHEATER DRAINS
4. ALL BOILER DRAINS
5. CBD AT HIGH PRESSURE DRUM
6. HIGH PRESSURE DISCHARGE BV ON BOTH BF PUMPS
7. NON RETURN
8. LEAD LINE MOV

C. FILL FOR HYDRO

1. AT GROUND LEVEL BY FEED H2O REGULATOR, HAVE BOARD OPERATOR OPEN FEED H2O MOV BY-PASS.

2. CONNECT SPOOL PIECES ON CONDENSATE; FILL LINE TO HIGH PRESSURE FEED H2O LINE. CLOSE ALL BLEEDS ON FILL LINE.

3. OPEN CONDENSATE FILL BV FROM CONDENSATE HEADER.

4. OPEN HP BF (YELLOW HANDLE) THAT TIES THE CONDENSATE SYSTEM TO THE FEEDWATER SYSTEM.

5. WHEN DRUM LEVEL STARTS TO RISE, POSITION AN OPERATOR AT TOP OF BOILER. WHEN WATER COMES OUT OF DRUM, CLOSE DRUM VENT.

6. WAIT UNIT YOU GET WATER OUT OF SH THEN CLOSE SH VENT.

7. LET BOILER PRESSURE UP TO CONDENSATE HEADER PRESSURE.

8. CLOSE HP CONDENSATE FILL BV (YELLOW HANDLE).

9. LEAVE LOW PRESSURE CONDENSATE FILL BV'S OPEN TO CONDENSATE SYSTEM IN CASE HP FILL BV LEAKS THRU.

D. PUTTING THE SQUEEZE ON THE BOILER

DO A 134023
CONFIDENTIAL

1. NORMAL HYDRO PRESS ON HP BOILER IS 1000 PSI.

2. SOURCE OF HYDRO PRESS IS OFF THE HP BFP FROM THE GT THAT IS RUNNING. CLOSE ALL BLEEDS ON HYDRO LINES.

3. PRESSURE UP HYDRO LINE FROM UPSTREAM OF FW REGULATOR OF UNIT THAT IS RUNNING TO DOWNSTREAM OF FW REGULATOR OF UNIT WHICH IS TO BE HYDRO'D.

4. POSITION AN OPERATOR ON TOP OF BOILER MONITORING HP DRUM PRESSURE.

5. OPERATOR ON GROUND SLOWLY CRACKS HYDRO VALVE APPLYING PRESSURE TO BOILER. WHILE WATCHING GAUGE ON FEED WATER LINE

3. OPEN CONDENSATE FILL BV FROM CONDENSATE HEADER.

4. OPEN HP BF (YELLOW HANDLE) THAT TIES THE CONDENSATE SYSTEM TO THE FEEDWATER SYSTEM.

5. WHEN DRUM LEVEL STARTS TO RISE, POSITION AN OPERATOR AT TOP OF BOILER. WHEN WATER COMES OUT OF DRUM, CLOSE DRUM VENT.

6. WAIT UNIT YOU GET WATER OUT OF SH THEN CLOSE SH VENT.

7. LET BOILER PRESSURE UP TO CONDENSATE HEADER PRESSURE.

8. CLOSE HP CONDENSATE FILL BV (YELLOW HANDLE).

9. LEAVE LOW PRESSURE CONDENSATE FILL BV'S OPEN TO CONDENSATE SYSTEM IN CASE HP FILL BV LEAKS THRU.

D. PUTTING THE SQUEEZE ON THE BOILER

1. NORMAL HYDRO PRESS ON HP BOILER IS 1000 PSI.

2. SOURCE OF HYDRO PRESS IS OFF THE HP BFP FROM THE GT THAT IS RUNNING. CLOSE ALL BLEEDS ON HYDRO LINES.

3. PRESSURE UP HYDRO LINE FROM UPSTREAM OF FW REGULATOR OF UNIT THAT IS RUNNING TO DOWNSTREAM OF FW REGULATOR OF UNIT WHICH IS TO BE HYDRO'D.

4. POSITION AN OPERATOR ON TOP OF BOILER MONITORING HP DRUM PRESSURE.

5. OPERATOR ON GROUND SLOWLY CRACKS HYDRO VALVE APPLYING PRESSURE TO BOILER. WHILE WATCHING GAUGE ON FEED WATER LINE.

6. ALSO, ASK BOARD OPERATOR TO WATCH DRUM PRESSURE GAUGE IN CONTROL ROOM.

7. IF BOARD OPERATOR GETS LOW DISCHARGE PRESSURE ALARM ON BFP THAT IS RUNNING, THIS MEANS YOU ARE USING TOO MUCH WATER AND NEED TO CUT BACK ON HYDRO.

8. ONCE YOU HAVE REACHED 1,000 PSI ON BOILER, MAINTAIN WHILE INSPECTION IS BEING DONE. (MAINTAIN PRESSURE FOR 30 MINUTES PRIOR TO INSPECTION).

9. ONCE HYDRO IS COMPLETE,

   A. OPEN DRUM AND SUPERHEATER VENTS
   B. DRAIN BOILER TO FIRING LEVEL
   C. DRAIN SUPERHEATER SECTION
   D. DOUBLE BLOCK AND BLEED HYDRO LINES TO UNIT

NOTE: NEVER LEAVE HYDRO STATION UNATTENDED BECAUSE BOILER PRESSURE CAN GET AWAY FROM YOU CAUSING SAFETIES TO BLOW IF PRESSURE GETS TOO HIGH. A PERSON MUST REMAIN AT THE TOP OF THE BOILER TO WATCH THE DRUM PRESSURE GAUGE. ANOTHER PERSON MUST REMAIN AT THE HYDRO VALVE BY THE HP REGULATOR.

REVISED: JML
07/03/91
BLOCK #30

DO A 134024
CONFIDENTIAL

HRU 300 & 400 HYDRO TEST OF M.P. BOILER AT 125#

NOTE: GAS TURBINE IS DOWN, BFP'S ARE TAGGED ELECTRICALLY AND CONDENSATE HEADER IS PRESSURED UP.

A. THE FOLLOWING VENTS MUST BE OPEN:

1. M P. DRUM VENTS
2. M. P. SUPERHEATER VENTS.
3. M. P. VENT BETWEEN NON-RETURN AND LEAD LINE OPEN (IN CASE NON-RETURN LEAKS THROUGH)

B. THE FOLLOWING VALVES MUST BE CLOSED PRIOR TO FILLING M. P. BOILER:

1. UPSTREAM WARM-UP BLOCK VALVE AROUND LEAD LINE BLOCK VALVE.
2. ALL M. P. BOILER DRAINS.
3. M. P. SUPERHEATER DRAINS.
4. CONTINUOUS BLOWDOWN FROM H. P. BOILER.
5. CONTINUOUS BLOWDOWN TO L. P. BOILER.
6. M. P. DISCHARGE ON BFP'S
7. M. P. NON-RETURN
8. M. P. LEAD LINE.
9. M. P. ECONOMIZER DRAINS.
10. L. P. FEEDWATER REGULATOR SHOULD BE MANUALLY BLOCKED IN CASE REGULATOR LEAKS THROUGH.

C. IN ORDER TO FILL FOR HYDRO, THE FOLLOWING MUST BE DONE.

1. HAVE BOARD OPERATOR OPEN M. P. FEEDWATER MOV BY-PASS.
2. OPEN BV'S UPSTREAM AND DOWNSTREAM OF SPOOL PIECE.

NOTE: BOILER SHOULD BE FILLING AT THIS TIME.

4. WHEN DRUM LEVEL STARTS TO RISE, SEND AN OPERATOR TO THE TOP OF THE BOILER.
5. WHEN WATER BEGINS COMING OUT OF THE DRUM VENTS, CLOSE DRUM VENTS AND TELL OPERATOR DOWNSTAIRS THAT YOU ARE GETTING WATER OUT OF THE DRUM VENT.
6. CONTINUE TO FILL UNTIL YOU GET WATER OUT OF THE SUPERHEATER VENT. THEN CLOSE VENT AND INFORM OPERATOR DOWNSTAIRS.
7. M. P. DRUM SHOULD PRESSURE UP TO CONDENSATE HEADER PRESSURE, 125#.
8. AFTER MAINTAINING M. P. BOILER AT 125# FOR ONE (1) HOUR, IT IS THEN OKAY TO INSPECT FOR LEAKS.
9. AFTER INSPECTION OF M. P. BOILER AND IF NO LEAKS ARE FOUND, DE-PRESSURE AND DRAIN THE BOILER AND PREPARE THE BOILER FOR START UP. DOUBLE BLEED AND BLEED HYDRO HEADERS.

NOTE: OPEN THE SUPERHEATER VENTS AND DRAINS TO INSURE THE SUPERHEATER IS COMPLETELY DRAINED BEFORE START UP.

THIS PROCEDURE REPLACED ORIGINAL PROCEDURE - HYDO TEST OF M. P. AND L. P. BOILER.

REVISED: JML
7/03/91
BLOCK #31

UPDATED: JML
12/16/93

DO A 1340.25
CONFIDENTIAL

HRU-300/400 DRUM ENTRY AND CHECKLIST

DRUM ENTRY PROCEDURE AND CHECKLIST - HRU 300/400

CONDITIONS:

GAS TURBINE SHUT DOWN AND TAGGED: DRUM VENTED AND DRAINED; BOILER FEED PUMPS ISOLATED AND TAGGED.

CHECKLIST:

		YES	NO
1.	PULL STARTING MOTOR AND DISCONNECTS AND TAG.	____	____
2.	BLOCK IN FUEL GAS AND VENT FUEL LINE.	____	____
3.	STEAM NON-RETURN CLOSED AND TAGGED. STEAM OUTLET LINE VENTS OPEN, DRUM VENTS OPEN.	____	____
4.	PO4 PUMPS TAGGED.	____	____
5.	BOILER FEED PUMPS ISOLATED AND TAGGED. FEEDWATER REGULATORS BLOCKED AND BY-PASSES CLOSED AND TAGGED. (HP AND MP)	____	____
6.	FEEDWATER REGULATOR AND BY-PASS VALVE BLOCKED AND TAGGED (LP BOILER).	____	____
7.	SUPERHEATER BY-PASS CONTROL VALVE AND BY-PASS VALVE BLOCKED AND TAGGED (HP BOILER).	____	____
8.	CONTINUOUS BLOWDOWN LINES IN OR OUT OF DRUM BLOCKED AND TAGGED.	____	____
9.	CORTROL AND SULFITE LINE DOIBLE BLOCKED, BLED AND TAGGED	____	____
10.	MEDIUM PRESSURE ECONOMIZER TO DA LINE DOUBLE BLOCKED BLED, AND TAGGED	____	____
11.	BOTH ENDS OF DRUM OPEN.	____	____
12.	OXYGEN AND COMBUSTIBLES TEST O.K.	____	____
13.	AFTER 02 AND COMBUSTIBLE CHECK, INSTALL AIR MOVER PROPER VENTILATION.	____	____
14.	APPROPRIATE PERMITS OBTAINED.	____	____

REVISED: JML
12/23/92
BLOCK #33

DO A 1340?6
CONFIDENTIAL

HRU-300/400 BOILER ENTRY CHECKLIST

BOILER ENTRY CHECKLIST - HRU-300/400

CONDITIONS:

GAS TURBINE IS DOWN AND ON TURNING GEAR.

PROCEDURE:

		YES	NO
1.	PULL DISCONNECT ON STARTING MOTOR AND RED TAG.	____	____
2.	DOUBLE BLOCK & BLEED & RED TAG FUEL GAS, SYN GAS, STEAM INJECTION AND NITROGEN TO UNIT.	____	
3.	HP, MP, AND LP STEAM LEAD LINES, NON-RETURN VALVES AND WARM UP LINES DOUBLE BLOCK, BLEED, AND RED TAG VENTS BETWEEN LEAD LINE AND NON RETURN TAGGED OPEN.	____	
4.	CHEMICAL FEED PUMPS BLOCKED AND TAGGED, DOUBLE BLOCK AND BLEED OR DISCONNECT.	____	
5.	DISCONNECTS PULLED AND RED-TAGGED ON BOILER FEED PUMPS.	____	
6.	ALL FEEDWATER ON HP, MP, AND LP DRUMS DOUBLE BLOCK AND BLEED AND RED TAGGED.	____	
7.	BOILER COMPLETELY VENTED AN DRAINED.	____	____
8.	O2 AND EXPLOSIMETER TESTS RUN AND RESULTS O.K.	____	
9.	PROPER PERMITS OBTAINED FROM CONTROL ROOM.	____	

REVISED: NLC
11/15/91
BLOCK #34

DO A 134077
CONFIDENTIAL

TEXT BLOCK # 35

HRU-300/400 DRAINING THE BOILER

DRAINING THE BOILER - HRU 300/400

CONDITIONS:

BOILER WILL BE DOWN FOR AN INDEFINITE PERIOD OR NEEDS TO BE COMPLETELY DRAINED FOR MAINTENANCE REASONS. (NOTE: EACH BOILER SECTION CAN BE DRAINED INDIVIDUALLY AFTER DRUM IS DRAINED. BOILER MUST BE STOPPED STEAMING BEFORE DRAINING).

PROCEDURE:

1. SHUT DOWN BOILER FEED PUMPS AND RED TAG.
2. BLOCK IN AND TAG FEEDWATER CONTROL VALVES AND BY-PASSES.
3. BLOCK IN STEAM NON-RETURN VALVES.
4. BLOCK IN PO4 LINE TO HP DRUM AND TAG.
5. BLOCK IN CONTINUOUS BLOWDOWN LINES.

TO COMPLETELY DRAIN THE BOILERS, THE FOLLOWING VENTS MUST BE OPENED AND RED TAGGED.

1. HP SUPERHEATER OUTLET VENT BEFORE NON-RETURN
2. HP BOILER DRUM VENT
3. MP SUPERHEATER VENT
4. MP BOILER DRUM VENT
5. LP SUPERHEATER VENT (LOCATED ON OUTLET LINE AFTER MP STEAM LINE)
6. LP BOILER DRUM VENT
7. FEEDWATER PREHEATER VENTS (6 ON EACH SECTION).

   NOTE: IF ECONOMIZER SECTIONS ARE TO BE DRAINED, APPROPRIATE VENTS ON EACH SECTION MUST BE OPENED.

THE FOLLOWING DRAIN VALVES MUST BE OPENED TO COMPLETELY DRAIN THE BOILER:

1. HP SUPERHEATER DRAINS (6)
2. HP BOILER DRAINS (6)
3. MP SUPERHEATER DRAINS (6)
4. MP BOILER DRAINS (6)
5. LP BOILER DRAINS (6)

   NOTE: EACH BOILER DRUM HAS TWO FEEDERS WHICH CAN BE DRAINED. EACH LP BOILER HAS A 4" FEEDER. EACH MP BOILER HAS A 6" FEEDER, AND EACH HP BOILER HAS TWO 10" FEEDERS. EACH FEEDER CAN BE DRAINED THRU A 2" DRAIN VALVE.

6. HP ECONOMIZER 2 DRAIN VALVES

DO A 134028
CONFIDENTIAL

7. HP ECONOMIZER #1 DRAIN VALVES

8. MP ECONOMIZER DRAIN VALVES

9. FEEDWATER PREHEATER DRAINS

RE-INSTALLED: JML
10/03/90
BLOCK #35

DO A 134029
CONFIDENTIAL

TEXT BLOCK # 36

SAFE WORK PROCEDURE

DEPRESSURING AND DRAINING DEAERATOR AND LP BOILER AFTER HYDROSTATIC TEST - HRU 300/400

CONDITIONS:

DEAERATOR AND LP BOILER READY FOR DRAINING AFTER HYDRO TEST AT CONDENSATE HEADER PRESSURE.

PROCEDURE:

1. CLOSE DEAERATOR LEVEL CONTROL BY-PASS.

2. SLOWLY OPEN DRAIN VALVE ON A LP BOILER SECTION AND ALLOW BOILER AND DEAERATOR TO DE-PRESSURE.

3. OPEN VENT ON STEAM SUPPLY LINE TO DEAERATOR. AS LEVEL DROPS OPEN VENTS ON DEAERATOR AND LP DRUM.

NOTE: IF DESIRED TO DRAIN BOILER AND NOT DEAERATOR, CLOSE BY-PASS VALVE AROUND LP BOILER FEEDWATER REGULATOR.

REVISED: JML
07/02/91
BLOCK #36

DO A 134030
CONFIDENTIAL

HRU-300 TAKING DA OUT OF SERVICE

TAKING DEAERATOR OUT OF SERVICE FOR MAINTENANCE WORK

CONDITIONS:

TURBINE IS DOWN, ALL BFP'S OFF.

PROCEDURE:

1. BLOCK IN UPSTREAM AND DOWNSTREAM BV'S AROUND LEVEL CONTROL VALVE. INSURE BY-PASS BLOCK VALVE IS CLOSED.

2. BLOCK IN CORTROL FEED TO STORAGE TANK. RED TAG BOILER FEED PUMPS ELECTRICALLY.

3. BLOCK IN SUCTION LINES TO THE BOILER FEED PUMPS.

4. BLOCK IN BFP RECIRCULATION LINE.

5. BLOCK THE 30# STEAM SUPPLY TO THE DA AT THE VALVE OFF THE MAIN STEAM HEADER. ALSO BLOCK WARM-UP BY-PASS VALVE IN.

6. OPEN 2" VENT ON DA FULLY.

7. DRAIN STORAGE TANK ONLY IF NOT STEAMING AND IF MAINTENANCE IS TO BE PERFORMED ON DA.

REVISED: CNS
04/22/92
BLOCK #37

DO A 134031
CONFIDENTIAL

HRU-300/400 FILLING THE BOILERS

FILLING THE BOILERS - HRU 300/400

CONDITIONS:

GAS TURBINE IS DOWN; BOILER HAS BEEN DRAINED AND OPENED. ALL MASTERS HAVE BEEN CLEARED.

PROCEDURE:

1. MAKE SURE BOILER FEED PUMS ARE LINED UP FOR SERVICE. DEAERATOR SHOULD BE IN SERVICE; LEVEL SHOULD BE NORMAL AND LEVEL CONTROL VALVE UNBLOCKED.

2. ALL ECONOMIZER, DOWNCOMERS, AND LOWER HEADER DRUM VALVES SHOULD BE CLOSED.

3. ALL DRUM AND SUPERHEATER VENTS SHOULD BE OPEN. SUPERHEATER DRAINS SHOULD BE CLOSED.

4. MAKE SURE VALVES TO ALL LEVEL INDICATORS ARE OPEN.

5. ALL DRUM LEVEL FEEDWATER REGULATORS BLOCKED IN AND BY-PASSES CLOSED.

LOW PRESSURE BOILER

1. SLOWLY CRACK LOW PRESSURE BOILER FEEDWATER REGULATOR AND FILL LOW PRESSURE DRUM. WATCH DEAERATOR LEVEL CLOSELY. WHEN DESIRED LEVEL IS REACHED, CLOSE BY-PASS AND UNBLOCK FEEDWATER REGULATOR.

MEDIUM AND HIGH PRESSURE BOILERS

1. START EITHER OF THE BOILER FEED PUMPS. (REFER TO PROCEDURES FOR BOILER FEED PUMP START UP). FILL BOTH DRUMS WITH BY-PASS VALVES AROUND FEEDWATER CONTROL VALVES. FILL SLOWLY AND WATCH DEAERATOR LEVEL. WHEN DESIRED LEVEL IS REACHED, CLOSE BY-PASSES AND STOP PUMP. UNBLOCK FEEDWATER REGULATORS.

REVISED: JML
07/02/91
BLOCK #38

UPDATED: JMC
2/23/94

TEXT BLOCK # 39

SAFE WORK PROCEDURE

UNIT 300/400 DEAERATOR

OPERATING PRESSURE:	30 PSIG
OPERATING TEMPERATURE:	275 DGF
CAPACITY (HOLDING):	16,000 GALLONS
CAPACITY (FLOW):	

ESTABLISHING DEAERATOR LEVEL:

CONDITIONS:

HRU IS DOWN; ALL BFP'S OFF.

PROCEDURE:

1. OPEN 2" VENT VALVE ON TOP OF DEAERATOR.

2. BE SURE ALL VALVES TO LEVEL INDICATING AND PRESSURE TRANSMITTERS ARE OPEN.

3. PLACE DEAERATOR LEVEL CONTROL VALVE ON MANUAL AND CLOSE; BE SURE BY-PASS IS CLOSED.

4. OPEN UPSTREAM AND DOWNSTREAM BLOCK VALVES TO LEVEL CONTROL VALVE. CRACK OPEN 1" DRAIN JUST BEFORE CB SLIGHTLY IF LINE IS COLD.

5. OPEN 1" VENT PARTIALLY ON EACH FEEDWATER PREHEATER SECTION. AS PREHEATERS FILL, CLOSE VENTS.

6. PUT CONDENSATE FLOW CONTROLLER TO CONDENSATE HEADER ON MANUAL AND CLOSE. OPEN UPSTREAM AND DOWNSTREAM BV'S. BE SURE BY-PASS IS CLOSED.

7. CHECK DEAERATOR DUMP CONTROL VALVE AND UNBLOCK. BE SURE MANUAL DUMP IS CLOSED.

8. PUT LP BOILER DUMP LEVEL CONTROLLER ON MANUAL AND CLOSE. OPEN BLOCK VALVES BEFORE AND AFTER REGULATOR. BE SURE MANUAL BY-PASS IS CLOSED.

9. PUT FW PREHEATER BY-PASS CV ON MANUAL AND CLOSE. OPEN BV'S BEFORE AND AFTER CONTROL VALVE. BE SURE MANUAL BV IS CLOSED.

10. PUT FW DRUM LEVEL CONTROLLERS FOR MP AND HP BOILERS ON MANUAL AND CLOSE. OPEN BV'S BEFORE AND AFTER REGULATOR. BE SURE MANUAL BY-PASSES ARE CLOSED.

11. ESTABLISH LEVEL IN DA BY USING THE LEVEL CONTROL VALVE ON MANUAL.

12. IF START-UP OF UNIT IS IMMINENT, LINE UP CORTROL FEED AND START INJECTIN(CORTROL INTO THE DEAERATOR.

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13. AFTER UNIT HAS COME UP TO 30#, CLOSE BACK ON 2" VENT.

NOTE: 1. THE DEAERATOR PRESSURE AND LP BOILER DRUM PRESSURE MUST BE BE EQUAL. IT MAY BE NECESSARY TO PINCH BACK ON THE 2" DA VENT BEFORE PRESSURE REACHES 30 PSIG.

2. PUT DA LEVEL CONTROL VALVE ON AUTO AS SOON AS SOME FLOW IS ESTABLISHED THROUGH DEAERATOR.

3. PUT ... FEED TEMPERATURE CONTROLLERS (2) ON AUTO AS SOON

CLOSED.

9. PUT FW PREHEATER BY-PASS CV ON MANUAL AND CLOSE. OPEN BV'S BEFORE AND AFTER CONTROL VALVE. BE SURE MANUAL BV IS CLOSED.

10. PUT FW DRUM LEVEL CONTROLLERS FOR MP AND HP BOILERS ON MANUAL AND CLOSE. OPEN BV'S BEFORE AND AFTER REGULATOR. BE SURE MANUAL BY-PASSES ARE CLOSED.

11. ESTABLISH LEVEL IN DA BY USING THE LEVEL CONTROL VALVE ON MANUAL.

12. IF START-UP OF UNIT IS IMMINENT, LINE UP CORTROL FEED AND START INJECTING CORTROL INTO THE DEAERATOR.

13. AFTER UNIT HAS COME UP TO 30#, CLOSE BACK ON 2" VENT.

NOTE: 1. THE DEAERATOR PRESSURE AND LP BOILER DRUM PRESSURE MUST BE BE EQUAL. IT MAY BE NECESSARY TO PINCH BACK ON THE 2" DA VENT BEFORE PRESSURE REACHES 30 PSIG.

2. PUT DA LEVEL CONTROL VALVE ON AUTO AS SOON AS SOME FLOW IS ESTABLISHED THROUGH DEAERATOR.

3. PUT ALL ROTOR TEMPERATURE CONTROLLERS (3) ON AUTO AS SOON AS UNIT IS FIRED.

SAFETY CONSIDERATIONS:

HOT WATER IS THE CAUSE OF MANY ACCIDENTS. DOUBLE CHECK ALL VENTS AND DRAINS.

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HRU - 300/400 BOILER ENTRY

*NOTE: THE CONFINED SPACE CHECKLIST SUPPLEMENT AND SAFE WORK MULTI-PERMIT MUST BE COMPLETED.

1. DRAIN THE BOILER.

2. CLOSE AND RED TAG HIGH, MEDIUM AND LOW PRESSURE BOILER NON-RETURN VALVES.

3. CLOSE AND RED TAG ALL BOILER LEAD LINE VALVES.

4. CLOSE AND RED TAG ALL BOILER LEAD LINE WARM-UP VALVES.

5. OPEN ALL LEAD LINE DRAINS OR VENTS.

6. CLOSE AND RED TAG ALL FEEDWATER BLOCK AND BY-PASS VALVES.

7. CLOSE AND RED TAG ALL ECONOMIZER INLETS OR RACK OUT AND RED TAG ALL THE BOILER FEED PUMPS.

8. BLOCK IN AND BLEED DOWN GAS LINE ACCORDING TO TURBINE-GENERATOR PROCEDURE #19.

9. CLOSE AND RED TAG CHEMICAL FEED LINE BLOCK VALVES. DOUBLE BLEED AND BLEED OR DISCONNECTED.

10. CLOSE AND RED TAG THE STEAM INJECTION BLOCK VALVES, SYN GAS BV'S, AND NITROGEN BV'S.

11. RUN A OXYGEN TEST AND AN EXPLOSIMETER TEST IMMEDIATELY PRIOR TO ENTERING THE BOILER. IF THE BOILER IS LEFT UNATTENDED DURING THE WORK PERIOD, THE VESSEL MUST BE RETESTED FOR EXPLOSIVE LIMITS AND OXYGEN.

12. BECAUSE OF THE SIZE, COMPLEXITY AND NATURAL DRAFT OF OUR BOILERS AN AIR MOVER IS USELESS AND NORMALLY NOT NEEDED.

13. ONLY LOW VOLTAGE OR GROUND FAULT PROTECTED LIGHTING EQUIPMENT SHALL BE USED INSIDE THE BOILER. TRANSFORMER MUST ALWAYS BE PLACED OUTSIDE THE BOILER.

14. A SAFETY OBSERVER, SUPPLIED BY THE CRAFT DOING THE WORK, WILL BE STATIONED AT THE MANWAY AT ALL TIMES WHILE ANY WORKER IS IN THE BOILER. THE OBSERVER SHALL HAVE A FIVE (5) MINUTE ESCAPE PACK WITH HIM AT ALL TIMES AND A FIVE MINUTE ESCAPE PACK FOR EACH PERSON IN THE BOILER.

15. A SAFE WORK PERMIT MUST BE ISSUED FOLLOWING ALL THE GUIDELINES SET OUT IN SL&P STANDARD S-302 (SECTION 5).

16. THE INDIVIDUAL CRAFTS WORKING IN THE BOILER MUST SIGN THE APPROPRIATE RED TAG MASTERS.

17. A PROCEDURE AND EQUIPMENT FOR RESCUE MUST BE ON THE JOB SITE BEFORE ENTERING THE BOILER.

18. A CRAFT SAFETY MEETING WILL BE HELD BEFORE THE JOB BEGINS TO FAMILIARIZE THE MEN WITH OUT BLOCK AND ANY SPECIAL PROCEDURES OR EQUIPMENT.

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REVISED: JML
07/03/91
BLOCK #40

UPDATED: JML
12/29/93

TEXT BLOCK # 41

SAFE WORK PROCEDURE

BLEEDING THE CHEMICAL FEED PUMPS OF AIR

1. BLEEDING THE PO4 PUMPS.

   A. TURN PUMPS OFF - A OR B.

   B. CLOSE DISCHARGE VALVE.

   C. OPEN BLEED VALVE.

   D. TURN PUMP ON.

   E. ALLOW ALL AIR TO BLEED UNTIL A STEADY RHYTHM OF PO4/WATER IS FOUND.

   F. TURN PUMP OFF.

   G. CLOSE BLEED VALVE.

   H. OPEN DISCHARGE.

   I. RESTART PUMP.

2. BLEEDING THE SO3 PUMPS.

   A. TURN PUMP OFF.

   B. CLOSE DISCHARGE VALVE.

   C. REMOVE VALVE CAP.

   D. RESTART PUMP.

   E. ALLOW ALL AIR TO BLEED OUT UNTIL A STEADY PUMPING RHYTHM OF CHEMICAL IS FOUND.

   F. STOP PUMP.

   G. REPLACE VALVE CAP.

   H. OPEN DISCHARGE VALVE.

   I. RESTART PUMP.

REVISED: JML
07/02/91
BLOCK #41

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TEXT BLOCK # 121

BOILERS - 300/400

1. WHAT PRESSURE AND TEMPERATURE STEAM DOES EACH BOILER MAKE?
2. WHAT IS THE FLOW RATING OF EACH BOILER?
3. WHAT IS THE PURPOSE OF THE SUPERHEATER?
4. WHERE DOES THE HIGH PRESSURE STEAM GO?
5. WHERE DOES THE MEDIUM PRESSURE STEAM GO?
6. WHERE DOES THE LOW PRESSURE STEAM GO?
7. WHAT IS THE ECONOMIZER FOR?
8. HOW IS THE HP, MP, & LP STEAM SUPERHEATED?
9. HOW DO WE CONTROL THE HIGH PRESSURE SUPERHEATER OUTLET TEMP (HI & LOW)?
10. WHAT IS THE PURPOSE OF THE FEEDWATER PREHEATER?
11. EXPLAIN THE CONTINUOUS BLOWDOWN.
12. HOW IS OUR MANUAL BLOWDOWN SYSTEM NORMALLY SET UP AND WHEN DO WE USE IT?
13. IN PREPARATION FOR STARTUP, HOW MUCH WATER LEVEL SHOULD BE ESTABLISHED IN THE BOILERS.
14. HOW MANY INDICATORS OF DRUM LEVEL DO WE HAVE ON EACH BOILER?
15. HOW ARE THESE LEVELS CONTROLLED DURING STARTUP?
16. HOW SHOULD THE VARIOUS VENTS AND DRAINS BE SET UP PRIOR TO STARTUP?
17. WHEN SHOULD THEY BE CLOSED?
18. HOW DO YOU WARM UP THE STEAM LINES FROM THE HEADER TO THE NON-RETURN? WHY DO WE WARM THEM UP?
19. OF THE SAFETY VALVES ASSOCIATED WITH EACH BOILER, WHEN ONE OPENS FIRST AND WHY?
20. HOW IS THE D.A. DUMP VALVE IMPORTANT DURING STARTUP?
21. HOW IS THE CONDENSATE RETURN HEADER RELATED TO THE GT ROTOR AIR COOLER?
22. IS IT POSSIBLE TO CLOSE THE D.A. LEVEL CONTROL VALVE TIGHT? WHAT IS THE REASON FOR THIS?
23. WHY IS M.P. FEEDWATER SUPPLY NEEDED TO THE L.P. BOILER DURING STARTUP?
24. EXPLAIN THE CONDENSATE AND FEEDWATER SYSTEMS FOR HP, MP, & LP BOILERS.
25. TRACE OUT THE LP, MP, & HP STEAM SYSTEMS.
26. EXPLAIN WHERE ALL OF THE DRAIN LINES BELOW THE BOILERS COME FROM.

25. TRACE OUT THE LP, MP, & HP STEAM SYSTEMS.

26. EXPLAIN WHERE ALL OF THE DRAIN LINES BELOW THE BOILERS COME FROM.

CHEMICAL FEED SYSTEM - 300/400

1. DESCRIBE THE SULFITE FEED SYSTEM.

2. DESCRIBE THE PHOSPHATE FEED SYSTEM.

3. WHY SHOULD THE SULFITE TEST BE RUN FIRST?

4. WHAT EFFECTS IS ANY DOES HIGH SILICA HAVE ON THE BOILERS?

5. WHY DO WE KEEP THE REDUCING AGENTS FOR SILICA IN A DARK BOTTLE?

6. DURING WHAT TEST DO WE NEED TO WEAR MONOGOGGLES?

7. EXPLAIN WHAT TO DO WHEN THE PO4 AND SO4 PUMP STOPS PUMPING.

8. EXPLAIN HOW TO MEASURE THE FEED RATE FOR PO4 AND SO4 IN MILLILITERS PER MINUTE.

9. WHAT SHOULD THE MIXTURE OF THE CHEMICALS BE IN THE PO4 AND SO3 TANKS. (IN PERCENT).

BOILER FEED PUMPS - 300/400

1. WHAT ARE THE NORMAL DISCHARGE PRESSURE OF THE BOILER FEED PUMPS?

2. WHAT SIZE IS THE BOILER FEED PUMP MOTORS?

3. WHERE DOES THE BOILER FEED PUMP TAKE SUCTION?

4. WHAT HAPPENS IS THE BOILER FEED PUMP SUCTION PRESSURE FALLS BELOW A PRESET LEVEL?

5. WHAT IS THE NORMAL SOURCE OF LUBE OIL FOR THE BOILER FEED PUMPS? FOR THE MOTOR?

6. HOW IS THE LUBE OIL TEMPERATURE CONTROLLED ON THE BOILER FEED PUMP?

7. WHAT IS THE SOURCE OF WATER FOR THE SEALS?

8. EXPLAIN THE PROCEDURE FOR ISOLATING AND RED TAGGING A BOILER FEED PUMP AND MOTOR. WHAT IF THE MOTOR IS TO BE WORKED ON?

9. WHAT DO YOU CHECK PRIOR TO STARTING UP A BOILER FEED PUMP?

10. HOW IS THE BOILER FEED PUMP MOTORS COOLED?

11. WHAT IS THE PURPOSE OF THE RECIRCULATION LINE?

12. AT APPROXIMATELY WHAT PRESSURE WILL THE BOILER FEED PUMP TRIP ON THE LOW OIL PRESSURE?

13. WHAT IS THE PURPOSE OF THE WARM UP LINE? EXPLAIN HOW IT WORKS.

TEXT BLOCK # 123

TURBINE - 300/400

1. DESCRIBE THE 300/400 TRAIN (WEST TO EAST).

   A. WHAT ARE THE MAIN DIFFERENCES BETWEEN 100/200 AND 300/400.

2. EXPLAIN THE LUBE OIL SYSTEM. (POINT OUT EACH COMPONENT IN THE LUBE OIL SYSTEM AND TELL WHAT IT DOES AND WHY ITS THERE.)

   A. WHAT IS NORMAL HIGH PRESSURE OIL PRESSURE?

   B. WHAT IS HIGH PRESSURE OIL AND WHERE DOES IT COME FROM?

   C. WHAT IS NORMAL BEARING OIL PRESSURE?

   D. WHAT IS THE DIFFERENCE IN HIGH PRESSURE OIL AND BEARING OIL?

   E. WHAT IS NORMAL LUBE OIL RES. VACUUM?

   F. WHAT IS CONSIDERED A HIGH DIFFERENTIAL PRESSURE ACROSS THE LUBE OIL OIL FILTERS?

   G. WHAT ARE THE THREE USES OF LUBE OIL BESIDE BEARING LUBRICATION?

   H. HOW MANY OIL COOLERS ARE THERE? HOW MANY ARE NORMALLY IN SERVICE? HOW CAN YOU TELL WHICH IS IN SERVICE?

   I. CAN THE LUBE OIL COOLERS BE SWITCHED WITH MACHINE IN SERVICE? IF SO, HOW?

   J. CAN THE LUBE OIL FILTERS BE SWITCHED WITH MACHINE IN SERVICE? IF SO, HOW?

   K. WHAT IS THE CORRECT PROCEDURE FOR SWITCHING LUBE OIL PUMPS?

   L. HOW DOES THE OIL RESERVOIR WATER DETECTOR WORK? WHAT IS THE INDICATION FOR WATER IN THE RESERVOIR?

   M. WHAT IS THE SOURCE OF TORQUE CONVERTER OIL? WHAT IS THE PRESSURE OF THIS OIL?

   N. HOW MANY VAPOR EXTRACTORS ARE THERE? WHERE ARE THEY CONNECTED?

   O. IF THE MAIN VAPOR EXTRACTOR FAILS AND THE STANDBY CANNOT MAINTAIN RESERVOIR VACUUM, WHAT COULD BE THE PROBLEM?

   P. WHAT STARTS THE D.C. EMERGENCY LUBE OIL PUMP? HOW LONG WILL THE MACHINE RUN WITH THE D.C. PUMP AS THE ONLY SOURCE OF OIL SUPPLY?

3. EXPLAIN THE SEAL OIL SYSTEM. (POINT OUT EACH COMPONENT IN THE SEAL OIL SYSTEM AND TELL WHAT IT DOES AND WHY IT'S THERE.)

   A. WHAT IS NORMAL SEAL OIL SUPPLY PRESSURE?

   B. WHAT IS NORMAL SEAL OIL DIFFERENTIAL PRESSURE?

   C. WHAT IS NORMAL SEAL RESERVOIR VACUUM?

   D. WHAT ARE THE THREE SEAL OIL SUPPLY SOURCES?

   E. WHAT IS THE NORMAL SOURCE OF SEAL OIL?

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F. WHAT COULD YOU DO TO CORRECT LOW SEAL OIL DIFFERENTIAL PRESSURE?

G. HOW COULD YOU MANUALLY START THE STANDBY SEAL OIL PUMP? IS IT A.C. OR D.C.? WHERE DOES THE STANDBY PUMP GET ITS SUCTION?

H. AT WHAT PRESSURE DOES THE MACHINE TRIP ON LOW SEAL OIL DIFFERENTIAL PRESSURE?

I. WHAT IS THE NORMAL RANGE OF SEAL OIL TEMPERATURE?

J. UNDER WHAT CONDITIONS WOULD THE SEAL OIL SUPPLY NOT BE COOLED OIL?

K. WHERE ARE THE DEFOAM TANKS AND HOW MANY ARE THERE?

L. HOW IS OIL LEVEL MAINTAINED IN THE DEFOAMING TANKS?

M. WHERE CAN YOU CHECK DEFOAM TANK LEVEL?

N. WHAT COULD BE THE RESULT OF AN EXTRA HIGH LEVEL IN THE DEFOAM TANK?

O. WHAT CONTROLS THE LEVEL IN THE SEAL OIL DRAIN TANK (LOOP SEAL TANK)?

P. WHAT COULD BE THE RESULT IF THE SEAL OIL DRAIN REGULATOR MALFUNCTION AND ALLOWED MORE OIL TO FLOW OUT OF THE LOOP SEAL TANK THAN IS FLOWING IN?

Q. HOW CAN THE LEVEL IN THE LOOP SEAL TANK BE CONTROLLED MANUALLY?

4. EXPLAIN THE H2 COOLING SYSTEM ON THE GENERATOR.

A. SHOW HOW TO PUT H2 IN THE GENERATOR.

B. SHOW HOW TO PURGE THE GENERATOR WITH CO2 AND THEN AIR AND BACK THE OTHER WAY.

C. WHY IS THE CO2 MANIFOLD AT THE BOTTOM OF THE GENERATOR AND THE H2 MANIFOLD AT THE TOP?

D. HOW DOES THE PURITY METER BLOWER WORK AND HOW SHOULD IT BE VALVE UP FOR H2 OR CO2.

E. WHERE COULD LIQUID COME FROM IN THE GENERATOR?

F. HOW DO YOU TEST THE LIQUID DETECTOR?

G. HOW DO YOU DRAIN LIQUID OUT OF THE LIQUID DETECTOR AND/OR GENERATOR

H. WHY SHOULD THE GAS CHANGE SELECTOR SWITCH BE IN THE GAS CHANGE POSITION WHEN ADDING HYDROGEN TO THE GENERATOR?

5. EXPLAIN THE FUEL GAS SYSTEM TO THE GT-300/400.

A. WHAT IS NORMAL FUEL GAS PRESSURE?

B. IF THE TURBINE TRIPS IS THERE STILL FUEL GAS INSIDE THE TURBINE ENCLOSURE.

6. EXPLAIN THE STEAM INJECTION SYSTEM.

A. WHERE DOES THE STEAM COME FROM?

B. WHAT IS THE NORMAL PRESSURE AND TEMPERATURE?

C. WHAT CAN THE PRESSURE GO TO AND HOW DOES THIS HAPPEN?

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D. HOW DO YOU WARM UP THE STEAM INJECTION LINE BEFORE PUTTING IN SERVICE?

E. WHY DOES STEAM BLOW OUT OF THE DITCH BEFORE THE STEAM INJECTION GOES ON?

7. WHAT DOES IGV STAND FOR?

A. WHERE ARE THE IGV'S LOCATED?

B. SHOW HOW TO TELL WHAT POSITION THE IGV'S ARE IN BY LOOKING AT THE POSITION INDICATOR.

C. WHAT DO THE IGV'S DO?

D. HOW DO THEY WORK?

8. WHERE IS THE ELECTRICAL PACKAGE?

A. POINT OUT THE STARTERS FOR THE FOLLOWING PUMPS.

1. LUBE OIL PUMP #1.
2. LUBE OIL PUMP #2.
3. EMERGENCY LUBE OIL PUMP.
4. EMERGENCY SEAL OIL PUMP.
5. LUBE OIL EVACTORS.
6. SEAL OIL EVACTORS.
7. BOTH BFP AUX. LUBE OIL PUMPS.

B. SHOW HOW TO SWAP LUBE OIL PUMPS.

C. SHOW HOW TO TEST THE FIELD GROUND DETECTOR.

D. WHAT VOLTAGE STARTERS ARE LOCATED IN THE ELECTRICAL PACKAGE (A.C. OR D.C.)?

E. SHOW HOW TO DE-ENERGIZE ALL THE POWER TO THE ELECTRICAL PACKAGE (480 VOLT A.C., 125 VOLT D.C.).

9. WHAT IS SNUFFING STEAM USED FOR?

A. WHERE DOES SNUFFING STEAM COME FROM?

B. WHERE IS THE SNUFFING STEAM CONTROL VALVE?

C. WHAT OPENS THE SNUFFING STEAM CONTROL VALVE?

D. HOW DO YOU RESET THE VALVE?

E. WHY IS IT IMPORTANT THAT THE STEAM TRAP, BELOW THE SNUFFING STEAM CONTROL VALVE, IS IN GOOD WORKING CONDITION?

10. WHAT THREE AREAS ARE HALOGEN FIRE EXT. SYSTEM LOCATED?

A. WHAT IS THE PRIMARY FIRE PROTECTION SYSTEM ON GT 300/400?

B. HOW DO HALOGEN SYSTEMS WORK?

C. WHERE IS THE MAIN CONTROL PANEL FOR THE TURBINE FIRE SYSTEM LOCATED?

D. HOW DO YOU MANUALLY DISCHARGE THE HALON SYSTEM?

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E. SHOW HOW TO RESET THE HORN AND FLASHING LIGHTS.

F. WHAT SHOULD YOU DO IF THE HALOGEN SYSTEM GOES OFF WHILE YOU ARE:

1. INSIDE THE BUILDING.
2. OUTSIDE THE BUILDING.

11. WHAT AREA DOES THE FOAM FIRE FIGHTING SYSTEM AFFECT?

A. WHERE DOES THE FOAM GO?

B. WHERE DOES THE FOAM COME FROM?

C. HOW DO YOU TURN THE FOAM SYSTEM ON?

D. IF THE SWITCH DID NOT WORK, HOW COULD YOU MANUALLY GET THE FOAM SYSTEM ON?

E. WHEN SHOULD YOU TURN THE FOAM SYSTEM ON?

F. HOW DO YOU TURN THE SPRINKLER SYSTEM ON TO THE MECHANICAL PACKAGE?

G. WHEN SHOULD YOU TURN THE SPRINKLER SYSTEM ON?

12. WHERE IS THE ROTOR AIR COOLER LOCATED?

A. WHAT IS THE ROTOR AIR COOLER USED FOR?

B. HOW DOES IT WORK?

C. WHY IS THERE A VENT VALVE ON THE BOTTOM OF THE ROTOR AIR COOLER?

D. WHEN DOES IT OPEN AND CLOSE?

E. WHY ARE THERE BLOCK VALVES AND A BYPASS VALVE IN THE WATER LINES TO THE ROTOR AIR COOLER?

13. DESCRIBE THE AIR INLET SYSTEM.

A. HOW DOES THE WATER HELP THE TURBINE?

B. HOW IS THE BASIN LEVEL CONTROL?

C. WHY DO WE BLOW DOWN WATER FROM THE COOLERS AND WHERE DOES IT GO?

REVISED: NLC
9/11/90
BLOCK #123

DO A 134043
CONFIDENTIAL

TEXT BLOCK # 232

REBUILDING GAUGE GLASSES - UNITS 300 AND 400

GENERAL

THE GAUGE GLASSES REQUIRE MINIMUM CARE FOR LONG PERIODS OF SERVICE. MAINTENANCE IS USUALLY CONFINED TO THE REPLACEMENT OF GASKETS AND MICA. THE GAUGE HAS BEEN DESIGNED TO PERMIT REBUILDING OF INDIVIDUAL PORTS. IT IS NOT NECESSARY TO REMOVE THE GAUGE FROM ITS MOUNTING FOR NORMAL PORT MAINTENANCE.
(WARNING: THE DRAIN VALVE MUST ALWAYS REMAIN OPEN WHILE REPAIRING THE GAUGE OR WHILE IT IS OUT OF SERVICE FOR ANY REASON).

PORT REBUILDING

1. WITH THE GAUGE OUT OF SERVICE AND DEPRESSURIZED, REMOVE THE COVER PLATE, CUSHION GASKET, STRIP PACKING, GLASS, MICA, PROTECTIVE GASKET, SEALING GASKET.

2. CLEAN THE GASKET SEATING SURFACE THOROUGHLY WITH A BRASS WIRE BRUSH. (CAUTION: DO NOT USE ANY HARD EDGE SCRAPERS AS THEY MAY DAMAGE SEATING SURFACE).

3. HANDLE MICA AND GLASS WITH CLEAN HANDS TO LENGTHEN THE LIFE OF THESE PARTS AND PROMOTE GOOD VISIBILITY. ALSO KEEP THE MICA AND GLASS FREE FROM MOISTURE OR FINGERPRINTS.
(CAUTION: USE ONLY COMMERCIAL GLASS CLEANERS OR HOUSEHOLD DETERGENTS ON GLASS SURFACE; DO NOT USE ABRASIVE CLEANERS).

4. REPLACE ALL PARTS IN THE FOLLOWING SEQUENCE: SEALING GASKET, PROTECTIVE GASKET, MICA, GLASS AND STRIP PACKING, CUSHION GASKET AND COVER PLATE.
(NOTE: IT IS VERY IMPORTANT THAT THE THREADS AND WASHER FACES OF THE HEADS OF ALL CAP SCREWS BE LIBERALLY LUBRICATED WITH MOLYKOTE TYPE "G").

COVER PLATE CAP SCREW TIGHTENING PROCEDURE

(WARNING: GAUGE MUST FIRST BE TAKEN OUT OF SERVICE AND DEPRESSURIZED).

1. THREAD THE CAP SCREWS INTO PLACE "FINGER TIGHT". APPLY 20 INCH-POUNDS OF TORQUE AT A TIME FOLLOWING A CRISS-CROSS SEQUENCE UNTIL EACH CAP SCREW HAS BEEN TIGHTENED TO A FINAL TORQUE OF 150 INCH-POUNDS FOR LOW MEDIUM PRESSURE GAUGES AND 360 INCH-POUNDS FOR HIGH PRESSURE GAUGES. CHECK THE FINAL TORQUE TO ENSURE AN EVEN TIGHTENING OF EACH PORT.

2. PUT GAUGE GLASS IN SERVICE USING SAFE WORK PROCEDURE - PLACING GAUGE GLASS IN SERVICE - UNITS 300 AND 400.

REVISED: NLC
9/12/90
BLOCK #232

DO A 134044
CONFIDENTIAL

TEXT BLOCK # 233

PLACING GAUGE GLASS IN SERVICE

(WARNING: WHEN PLACING A GAUGE INTO SERVICE, DO NOT STAND IN FRONT OF AND IN A DIRECT LINE OF SIGHT WITH THE GAUGE).

NOTE: WHEN PLACING A GAUGE INTO SERVICE ON AN OPERATING BOILER, PRECAUTIONS MUST BE TAKEN TO AVOID EXCESSIVE THERMAL SHOCK).

1. BEGINNING WITH ALL VALVES CLOSED, OPEN THE DRAIN VALVE AND CRACK CRACK OPEN THE STEAM VALVE SLIGHTLY TO ALLOW THE CONDENSATE TO FLOW THROUGH THE GAUGE FOR 15 MINUTES.

2. CLOSE THE DRAIN VALVE TO ALLOW THE GAUGE TO FILL UP WITH CONDENSATE.

3. CRACK OPEN THE WATER VALVE AND GRADUALLY AND ALTERNATELY CONTINUE TO OPEN THE STEAM AND WATER VALVES UNTIL FULLY OPEN. THE GAUGE IS NOW IN SERVICE.

4. IF THE GAUGE IS NEW OR HAS BEEN REPAIRED PRIOR TO PLACING IT IN SERVICE, IT WILL BE NECESSARY TO RE-TIGHTEN THE COVER PLATE CAP SCREWS AFTER THE GAUGE HAS BEEN IN SERVICE FOR 3 AND 24 HOURS. ON A REPAIRED GAUGE, ONLY THE REPAIRED PORTS NEED TO BE RE-TIGHTENED. IT IS NECESSARY TO TAKE THE GAUGE OUT OF SERVICE AND DEPRESSURIZE IT FIRST. REFER TO THE SAFE WORK PROCEDURE ENTITLED "REBUILDING GAUGE GLASSES - UNITS 300 AND 400" FOR COVER PLATE TIGHTENING.

(CAUTION: DO NOT USE VALVE WRENCHES OR OTHER LEVERAGE DEVICES TO OPEN AND CLOSE VALVES. IF VALVES DO NOT SHUT STEAM TIGHT WITH STANDARD HAND WHEELS OR CHAIN WHEELS, IT IS AN INDICATION THAT THE SEATS ARE STEAM CUT OR DAMAGED AND THEY SHOULD BE RE-LAPPED OR REPLACED).

REVISED: NLC
9/12/90
BLOCK #233

TESTING OPERATION OF ALL MOV'S ON MFW 300/400 FEEDWATER SYSTEM

TESTING FOR PRESSURE DRUM:

1 SLOWLY OPEN BY-PASS MOV UNTIL FEEDWATER REG. IS SHUT.

2 CLOSE FEEDWATER SHUTOFF MOV. OBSERVE FEEDWATER FLOW. VALVE [illegible] LEAK-THROUGH

3 IF FLOW DROPS, ADJUST BY-PASS MOV

4. PLACE FEEDWATER REGULATOR ON MANUAL AND OPEN REGULATOR 100% THAN BACK TO 0%. HAVE AUXILIARY OPERATOR OBSERVE OPERATION OF VALVE.

4. RAISE OR LOWER FEEDWATER FLOW TO CHECK HIGH AND LOW LEVEL ALARMS.

5. TO RETURN TO NORMAL OPERATION, INSURE CONTROL VALVE IS CLOSED AND OPEN SHUT-OFF MOV. WATCH FEEDWATER FLOW.

6. ONCE SHUT-OFF IS OPEN, START CLOSING BY-PASS MOV AND CONTROL VALVE SHOULD START OPENING.

~ [illegible] OPERATOR EXERCISE ALL OPERATION VALVES LOCALLY. TO TEST MEDIUM [illegible] LEVELS USE THE ABOVE PROCEDURE WITH THE MEDIUM PRESSURE [illegible]

[illegible]

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WARMING UP STEAM LEAD LINES - UNITS 100/200

DURING SHUTDOWNS, WHEN WATER/STEAM SIDE WORK IS SCHEDULED ON THE HRU, IT IS NECESSARY THAT THE STEAM LINES BE ISOLATED, BLED DOWN, AND RED-TAGGED. BEFORE RE-STARTING A UNIT, IT IS THEN NECESSARY TO WARM-UP AND PRESSURE UP THESE LINES UP TO THE BOILER NON-RETURNS.

PROCEED AS FOLLOWS:

1. INSURE THAT THE NON-RETURN VALVES (H.P., M.P., AND L.P.) ARE STILL CLOSED.

2. OPEN LEAD LINE VENTS TO ATMOSPHERE FROM EACH OF THE THREE LINES.

3. OPEN DRAIN ON 235# LINE AT NON-RETURN.

4. INSURE BOTTOM DRAIN ON THE M.P. LINE HAS BEEN CRACKED AND LINE IS FREE OF CONDENSATE.

5. OPEN BOTTOM DRAINS ON L.P. LINE AND BEFORE DA PRESSURE CONTROLLER.

6. CRACK OPEN WARM-UP VALVE AROUND 235# HEADER BLOCK VALVE, ADMITTING STEAM INTO THE LEAD LINE.

7. CRACK OPEN WARM-UP VALVE AROUND M.P. BLOCK VALVE, ADMITTING 30# STEAM INTO LEAD LINE.

8. CRACK OPEN WARM UP VALVE AROUND LP LEAD LINE.

9. OBSERVE ALL VENTS AND DRAINS AND GRADUALLY BEGIN CLOSING VALVES AS LINES HEAT UP AND STEAM DISCHARGE BECOMES DRIER. AT THE SAME TIME, GRADUALLY OPEN UP MORE ON WARM-UP VALVES, ADMITTING MORE STEAM.

10. AS PRESSURE INCREASES, THROTTLE VENTS TO MINIMIZE NOISE.

11. ALLOW PRESSURE TO BUILD UP IN EACH LINE, THROTTLING VENTS AND DRAINS AS NECESSARY. ALLOW PRESSURES TO EQUALIZE WITH THAT ON THE HEADERS.

12. OPEN BLOCK VALVES AND CLOSE WARM-UP VALVES ONLY AFTER VENT/DRAINS ARE BLOWING DRY STEAM. NOTE THAT THE BY-PASS AROUND THE 15/30# CHECK VALVE MUST BE LEFT OPEN TO MAINTAIN FLOW THROUGH THE L.P. LEAD LINE.

13. PLACE AVAILABLE STEAM TRAPS IN SERVICE.

14. OPEN NON-RETURN VALVES BEFORE STARTING UP GT.

SAFETY CONSIDERATIONS:

1. INSURE THAT RED TAGS HAVE BEEN PROPERLY RELEASED AND CLEARED.

2. WEAR HEARING PROTECTION.

3. WEAR GLOVES TO PREVENT BURNS.

4. PROCEED SLOWLY WITH COLD LINES. AVOID CREATING WATER HAMMER.

REVISED: JML
03/10/92
BLOCK #254

DO A 134047
CONFIDENTIAL

TEXT BLOCK # 281

DEAERATOR ENTRY SUPPLEMENT-UNITS 300/400

COMPLETION OF THIS SUPPLEMENT OCVERS ITEMS PECULIAR TO THIS EQUIPMENT AND NOT NECESSARILY INCLUDED IN THE MULTI-PERMIT. IN ADDITION TO AND AS ATTACHMENT TO THIS CHECKLIST, THE STANDARD VESSEL ENTRY PERMIT MUT BE ISSUED WITH AREAS NOTED THAT DO NOT APPLY.

		YES	NO
1.	CLOSE MAIN CONDENSATE BLOCK VALVE TO THE UNIT. RED TAG THIS VALVE.	____	____
2.	CLOSE UPSTREAM BV AT DA AT LEVEL CONTROL VALVE. INSURE BY-PASS BV IS CLOSED. RED TAG ALL THREE VALVES.	____	____
3.	CLOSE CONDENSATE RETURN TO POWER I BV AND OPEN BV TO DITCH. RED TAG VALVES.	____	____
4.	CLOSE AND RED TAG BFP'S RECIRCULATION VALVES.	____	____
5.	CLOSE BFP A & B SUCTION VALVES AND DISCHARGE VALVES AND RED TAG.	____	____
6.	OPEN AND TAG BFP A & B DRAINS.		
7.	OPEN DRAINS ON CONDENSATE HEADER AND DA FILL LINE.	____	____
8.	RED TAG CORTROL PUMP BREAKER AND LOCAL SWITCHES. DISCONNECT TUBING TO DRAIN.	____	____
9.	CLOSE DA STEAM PRESSURE REGULATOR BLOCK VALVE AND BY-PASS BLOCK VALVE AROUND THE REGULATOR.	____	____
10.	CLOSE DA STEAM BV AND UP STREAM WARM UP BV. OPEN DOWN STREAM WARMUP AND BLEED. RED TAG THOSE VALVES.	____	____
11.	OPEN DA BOTTOM DRAIN AND BY-PASS AROUND DA DUMP CONTROL VALVE.	____	____
12.	REMOVE MANWAY COVER FROM NORTHSIDE OF DA STORAGE TANK. ALSO REMOVE DOME COVER.	____	____
13.	PLACE AN AIR MOVER ON THE DOME OPENING TO MOVE AIR THROUGH THE STORAGE TANK. DA TANK TEMPERATURE MUST NOT EXCEED 120 DEGREES WHEN BEING ENTERED.	____	____
14.	BEFORE ENTRY: A) SIGN RED TAG MASTERS, B) OBTAIN VESSEL ENTRY PERMIT, C) REFER TO S & LP STANDARD S-302	____	____
15.	SAFETY OBSERVER WILL HAVE FIVE (5) MINUTE ESCAPE PACKS FOR EACH PERSON INSIDE THE VESSEL AND ONE FOR HIM/HER SELF.	____	____
16.	THE SAFETY OBSERVER IS A CERTIFIED HOLE WATCH.	____	____
17.	THE SAFETY OBSERVER HAS A HOLE WATCH CARD.	____	____

EXCEPTIONS TO STANDARD:

DO A 134048
CONFIDENTIAL

1. VALVES, INSTRUMENTS, AND INSTRUMENT LINES NOT DISCONNECTED. (1D)

2. USE OF FIVE (5) MINUTE ESCAPE PACKS RATHER THAN AIR LINE EQUIP. (4A)

3. LIFE LINE, HARNESS, ETC. NOT USED. (4B)

OPERATIONS REP: _____

MAINTENANCE REP: _____

REVISED: JML
07/03/91
BLOCK #281

HRU-300 DEAERATOR & STORAGE VESSEL ENTRY PROCEDURE

1. CLOSE AND RED TAG STEAM BLOCK VALVE UPSTREAM OF DEAERATOR STEAM PRESSURE CONTROL REGULATOR. RED TAG CONTROLLER IN CONTROL ROOM.

2. CLOSE AND RED TAG D.A. STEAM BV AND UPSTREAM WARM UP BV. OPEN DOWN STREAM WARM UP AND BLEED. TAG BLEED OPEN.

3. CLOSE CONDENSATE BLOCK VALVE UPSTREAM OF D.A. LEVEL CONTROLLER. ALSO CLOSE BY-PASS BLOCK VALVE. RED TAG BOTH OF THESE VALVES. OPEN DRAIN DOWNSTREAM OF THESE VALVES TO BLEED DOWN CONDENSATE HEADER.

4. CLOSE MAIN CONDENSATE BV TO THE UNIT AND RED TAG.

5. RED TAG CORTROL CHEMICAL PUMP ELECTRICAL CORD, BULK TANK BLOCK VALVE AND BLOCK VALVE AT D.A. DISCONNECT TUBING AT BULK TANK TO SERVE AS A BLEED.

6 CORTROL AND SULFITE LINE DOUBLE BLOCKED, BLED AND TAGGED.

7. MEDIUM PRESSURE ECONOMIZER TO DA LINE DOUBLE BLOCKED, BLED AND TAGGED.

8. OPEN AND RED TAG D.A. STORAGE TANK BOTTOM DRAIN AND THE BY-PASS AROUND D.A. DUMP CONTROLLER. THIS WILL COMPLETELY DRAIN THE D.A. STORAGE TANK. RED TAG BOILER FEED PUMPS ELECTRICALLY.

9 CLOSE SUCTION BLK VALVES AND RECIRCULATION VALVES ON BOILER FEED PUMPS (A & B) AND RED TAG OPEN DRAIN VALVES ON PUMPS.

10 REMOVE MANHOLE COVER FROM NORTH SIDE OF STORAGE TANK.

11 REMOVE MANHOLE COVER FROM NORTH SIDE OF DEAERATOR VESSEL.

12. PLACE AN AIR MOVER ON THE DA MANHOLE COVER TO MOVE AIR THROUGH THE STORAGE TANK AND VENTILATE.

13. BEFORE ENTRY, CHECK THE FOLLOWING:

   A. SIGN RED TAG MASTERS

   B. OBTAIN VESSEL ENTRY PERMIT

   C. REFER TO S & LP STANDARD S-307

REVISED: JNI
02/18/93
BLOCK #357

UPDATED JNI
08/30/93

TEXT BLOCK # 363

WASTE OIL PROCEDURE

1. OIL PADS, BOOMS, OIL SORB, OR LIQUID OIL MUST BE PACKAGED IN 30 GALLON BLACK PLASTIC CONTAINER. WEIGHT LIMIT SHOULD NOT EXCEED 200 POUNDS, UNLESS OTHERWISE SPECIFIED.

2. EACH PACK SHOULD BE LABELED ON SIDE ONLY AS FOLLOWS:

   CONTENTS (OR PADS, BOOMS, OIL SORB, OR LIQUID OIL)
   TYPE 1082
   POWER II
   DATE _____

3. ALL CONTAINERS ARE TO BE PLACED ON GOOD, USABLE PALLETS WITH NO MORE THAN FOUR (4) CONTAINERS, AND SEVERAL ROUNDS OF DUCT TAPE OR FIBERGLASS TAPE TO HOLD THEM IN PLACE. DO NOT DOUBLE STACK.

4. ALL CONTAINERS ARE TO BE IN GOOD CONDITION, AND HAVE LIDS AND RINGS ON THEM. THE LIDS ARE TO BE IN PLACE AND THE RINGS FASTENED IN SUCH A MANNER AS TO PREVENT THEM FROM POPPING UP WHILE BEING TRANSPORTED.

5. FOR PICKUP, CALL THE WASTE DISPATCHER AT EXT. 1860, RADIO 209.

REVISED: NLC
9/12/90
BLOCK #363

TEXT BLOCK # 364

OIL TESTING PROCEDURE

1. PLACE CLEAN OIL CATCH PAN OR BUCKET BENEATH THE BEARING HOUSING DRAIN POINT. CAUTION SHOULD BE TAKEN TO PREVENT OVERFLOWING THE PAN OR BUCKET.

2. WHILE THE OIL IS DRAINING AND AFTERWARDS, CEHCK THE BOTTOM OF THE DRAIN PAN FOR ANY SOLID PARTICLES AND IDENTIFY THEM IF POSSIBLE. IF METAL FRAGMENTS ARE FOUND, SOME DAMAGE TO THE BEARINGS HAS ALREADY OCCURRED, THEREFORE, AN MMR SHOULD BE SUBMITTED TO REBUILD THIS EQUIPMENT. IF OPERATIONS PERMITS, THIS EQUIPMENT SHOULD REMAIN RED TAGGED.

3. CHECK THE OIL FOR DISCOLORATION. THIS CAN BE DONE EASILY BY COMPARISON WITH SOME FRESH OIL OF THE SAME TYPE.

4. CHECK THE OIL FOR WATER CONTENT. WATER IS HEAVIER, SO IT SHOULD SEPARATE AND SETTLE TO THE BOTTOM.

5. MAINTENANCE SUPERVISOR SHOULD BE NOTIFIED IF PROBLEMS ARE FOUND.

REVISED: NLC
9/12/90
BLOCK #364

TEXT BLOCK # 365

BEARING HOUSING FLUSHING PROCEDURE

1. ALWAYS USE OIL OF THE SAME TYPE THAT WILL REMAIN IN THE BEARING HOUSING FOR LUBRICATION.

2. USING A CLEAN FUNNEL, POUR THE FRESH OIL INTO THE BEARING HOUSING THROUGH THE OIL FILLING HOLE AND COLLECT THE FLUSHED OIL AT THE LOW POINT DRAIN WITH THE OIL CATCH PAN OR BUCKET. FLUSH UNTIL CLEAN.

3. A VARSOL OR KEROSENE FLUSH IS REQUIRED BEFORE THE FRESH OIL FLUSH IF THE FOLLOWING CONDITIONS EXISTED WHEN THE OIL WAS TESTED.

   A. WATER IN THE OIL
   B. ANY SOLID PARTICLES IN THE OIL
   C. ANY DISCOLORATION OF THE OIL

4. IT MAY BE NECESSARY TO INSERT THE SPRAY NOZZLE FROM THE SPRAYER INTO THE OIL FILL HOLE AND SPRAY AT SEVERAL DIFFERENT ANGLES INSIDE THE BEARING HOUSING IN ORDER TO CLEAN IT SUFFICIENTLY.

REVISED: NLC
9/12/90
BLOCK #365

DO A 13405
CONFIDENTIAL

TEXT BLOCK 366

DIVERTING PLANT AIR TO ONE SET OF DRYERS

IN THE EVENT OF MALFUNCTION OF EITHER THE 900 OR THE 1000 AIR DRYERS, IT IS POSSIBLE FOR THAT SET TO BE ISOLATED AND PLANT AIR DIVERTED FROM THE PROBLEM AREA TO THE OTHER SET OF DRYERS. THE ISOLATION OF ONE SET OF DRYERS WILL HAVE NO AFFECT ON THE SERVICE AIR SYSTEMS. BOTH THE 900 AND THE 1000 AREAS WILL CONTINUE TO BE SUPPLIED, AS USUAL, FROM A COMMON, INTERCONNECTED SYSTEM.

TO SUPPLY PLANT AIR TO ONE SET OF DRYERS WHILE ISOLATING THE OTHER, PROCEED AS FOLLOWS:

1. OPEN BY-PASS VALVE AROUND THE INSTRUMENT AIR CONTROL STATION CONNECTING THE 900 SYSTEM TO THE 1000 SYSTEM (IF IT IS NOT ALREADY OPEN).

2. INSURE VALVE, IN THE PLANT AIR SYSTEM WHICH CONNECTS THE 900 TO THE 1000 AREA, IS OPENED (VALVE LOCATED OVERHEAD IN THE PIPERACK EAST OF THE 1000 STAND-BY AIR COMPRESSOR).

3. OPEN THE 900/1000 PLANT AIR TIE BLOCK VALVE AT 900 SYSTEM, LOCATED EAST OF COOLER (LABELED "PLANT AIR TO/FROM 1000 SYSTEM").

4. IT SHOULD NOT BE NECESSARY TO BLOCK IN ANY OF THE PLANT AIR SUPPLY LINES FROM THE INDIVIDUAL GT'S. CHECK-VALVES INSTALLED IN EACH OF THESE LINES SHOULD OFFER SUFFICIENT PROTECTION, UNLESS A UNIT IS SHUTDOWN FOR MAINTENANCE AND ANY AIR LEAKAGE BACK INTO IT WOULD CAUSE A PROBLEM.

5. ISOLATE THE MALFUNCTIONING SET OF DRYERS.

REVISED: NLC
9/12/90
BLOCK #366

DO A 1340[illegible]4
CONFIDENTIAL

TEXT BLOCK # 367

CHANGING OR REMOVING AIR DRYERS 900 SAFETY VALVES

NOTE: WHEN REMOVING SAFETY VALVES FROM THESE AIR DRYERS, IT IS IMPORTANT THAT THE UNIT BEING WORKED ON BE KEPT OUT OF SERVICE A MINIMUM OF TIME. SO IT IS NECESSARY THAT ALL TOOLS AND REPLACEMENT PARTS BE ON HAND NEAR THE JOB BEFORE STARTING.

SAFETY NOTE: EACH DRYER IS EQUIPPED WITH TWO SAFETY VALVES. REMOVE ONLY ONE VALVE FROM EACH LEAVING ONE TO PROTECT THE EQUIPMENT WHILE MAINTENANCE IS BEING CARRIED OUT ON THE OTHER.

1. OPEN FRONT PANEL DIRECTLY AFTER DRYER SWITCH. TURN OFF POWER TO THE TIMER. THIS WILL PREVENT ANY FURTHER SWITCHING OF THE DRYERS. RED TAG THIS SWITCH.

2. CLOSE PURGE AIR BLOCK VALVE. ALLOW PRESSURE TO COMPLETELY BLEED OFF DRYER THAT IS IN THE REGENERATION CYCLE. RED TAG THIS VALVE.

3. USING THE PROPER TOOLS, REMOVE STACK FROM THE SAFETY VALVE (THE ONE ON THE REGENERATING DRYER).

4. CAREFULLY REMOVE THE SCREWS FROM THE SAFETY VALVE. BE ALERT, THERE MAY BE A LITTLE PRESSURE REMAINING IN THE DRYER.

5. REMOVE THE SAFETY VALVE FROM THE TOP OF THE DRYER.

6. USING A NEW GASKET AND THE PROPER BLIND, CLOSE OFF THE HOLE PREVIOUSLY COVERED BY THE SAFETY VALVE. TIGHTEN SCREWS SUFFICIENT TO PREVENT AIR LEAKAGE.

7. TURN POWER BACK ON TO THE TIMER AND RE-ADJUST PURGE AIR TO 52#. REMOVE RED TAGS.

8. REPEAT PROCEDURE STEPS 1 TO 7 ON THE OPPOSITE DRYER.

9. WHEN DRYERS ARE AT FULL LOAD, CHECK THE BLINDS OR SAFETY VALVES FOR LEAKS.

10. PICK UP TOOLS AND EQUIPMENT. DISPOSE OF ANY TRASH.

NOTE: USE THIS PROCEDURE ALSO WHEN REMOVING BLINDS AND PUTTING SAFETY VALVES ON.

RED TAG LOCATIONS:

(1). DRYER TIMER SWITCH
(2). PURGE AIR BLOCK VALVE

REVISED: NLC
9/12/90
BLOCK #367

TEXT BLOCK # 368

CHANGING OR REMOVING AIR DRYER 1000 SAFETY VALVES

NOTE: WHEN REMOVING SAFETY VALVES FROM THESE AIR DRYERS, IT IS IMPORTANT THAT THE UNIT BEING WORKED ON BE KEPT OUT OF SERVICE A MINIMUM OF TIME. SO IT IS NECESSARY THT ALL TOOLS AND REPLACEMENT PARTS BE ON HAND NEAR THE JOB BEFORE STARTING.

1. AS SOON AS DRYERS SWITCH, TURN OFF POWER TO THE TIMER. THIS WILL PREVENT ANY FURTHER SWITCHING OF DRYERS. RED TAG THIS SWITCH.

2. TURN THE PURGE AIR OFF TO THE DRYER IN THE REGENERATION CYCLE. THIS REQUIRES A SMALL SCREWDRIVER WHICH IS USED TO TURN THE ADJUSTMENT SCREW CLOCKWISE UNTIL IT STOPS. CHECK PURGE AIR PRESSURE GAUGE TO INSURE PRESSURE IS COMPLETELY OFF THE DRYER.

3. WITH THE PROPER TOOL THE SAFETY RELIEF VALVE CAN NOW BE REMOVED. BE AWARE THAT THERE WILL BE PRESSURE REMAINING INSIDE SO SAFETY SHOULD BE POPPED BEFORE REMOVING.

4. AFTER REMOVAL OF THE SAFETY VALVE, REPLACE WITH THE SPARE SAFETY. USE TEFLON THREAD TAPE AND TIGHTEN SUFFICIENTLY TO PREVENT AIR LEAKAGE.

5. PUT THE PURGE AIR ON AND ADJUST THE PRESSURE TO READ 100#. TURN THE TIMER ON THE FRONT PANEL ON TO START THE DRYER CYCLE. REMOVE RED TAG.

6. CHECK FOR AIR LEAKS AROUND THE SPARE SAFETY THAT HAS BEEN INSTALLED.

7. REPEAT PROCEDURE STEPS 1 THRU 6 ON THE OPPOSITE DRYER IF THE SITUATION IS APPROPRIATE.

8. CLEAN UP ALL TRASH AND PLACE ALL TOOLS IN THEIR PROPER PLACE.

9. INSURE SAFETY VALVE GETS TO THE PERSON OR PERSONS WHO HANDLES THEIR MAINTENANCE.

RED TAG LOCATIONS:

(1). TIMER SWITCH AND DRYER CONTROL PANEL.

REVISED: NLC
9/12/90
BLOCK #368

DO A 134056
CONFIDENTIAL

HRU-300/400 BOILER ENTRY SUPPLEMENT

COMPLETION OF THIS SUPPLEMENT COVERS ITEMS PECULIAR TO THIS EQUIPMENT AND NOT NECESSARILY INCLUDED IN THE MULTI-PERMIT. IN ADDITION TO AND AS ATTACHMENTS TO THIS CHECKLIST, THE STANDARD VESSEL ENTRY PERMIT MUST BE ISSUED WITH AREAS NOTED THAT DO NOT APPLY.

		YES	NO
1.	THIS IS A GAS SIDE ENTRY.	____	____
2.	THIS IS A WATER SIDE ENTRY.	____	____
3.	FUEL GAS RED TAGGED WITH DOUBLE BLOCK AND BLEED.	____	____
4.	SYN GAS RED TAGGED WITH DOUBLE BLOCK AND BLEED.	____	____
5.	STEAM INJECTION RED TAGGED WITH DOUBLE BLOCK AND BLEED.	____	____
6.	NITROGEN SUPPLY RED TAGGED WITH DOUBLE BLOCK AND BLEED.	____	____
7.	H.P., M.P., AND L.P. STEAM LEAD LINES RED TAGGED WITH DOUBLE BLOCK AND BLEED.	____	____
8.	CONDENSATE TO HRU IS RED TAGGED WITH DOUBLE BLOCK AND BLEED.	____	____
9.	CHECMICAL FEED SYSTEM IS RED TAGGED WITH DOUBLE AND BLEED.	____	____
10.	BOILER FEED PUMPS RED TAGGED ELECTRICALLY.	____	____
11.	STARTING MOTOR RED TAGGED.	____	____
12.	APPROPRIATE RED TAG MASTERS SIGNED.	____	____
13.	BOARD OPERATOR WIL BE NOTIFIED OF ENTRY AND EXIT.	____	____
14.	LOW VOLTAGE OR GROUND FAULT PROTECTED LIGHTING IS AVAILABLE.	____	____
15.	SAFETY OBSERVER IS A CERTIFIED HOLE WATCH.	____	____
16.	SAFETY OBSERVER WILL HAVE THE APPROPRIATE NUMBER OF 5 MINUTE ESCAPE PACKS.	____	____
17.	AIR MOVER USED FOR VENTILATION	____	____

EXCEPTIONS TO STANDARD:

NOTE: ALL NEED NOT BE COMPLETED FOR EITHER A BOILER ENTRY OR AN HRU ENTRY.

1. VALVES, INSTRUMENTS, INSTRUMENT LINES NOT DISCONNECTED (1D)
2. USE OF 5-MIN. ESCAPE PACKS RATHER THAN AIR LINE EQUIPMENT. (4A)
3. LIFE LINE, HARNESS, ETC. NOT USED (4B)
4. AIR MOVER FOR VENTILATION NOT ALWAYS USED ON GAS SIDE - DEPENDENCE ON NATURAL DRAFT. (3A)

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EXCEPTIONS TO STANDARD:

NOTE: ALL NEED NOT BE COMPLETED FOR EITHER A BOILER ENTRY OR AN HRU ENTRY.

1. VALVES, INSTRUMENTS, INSTRUMENT LINES NOT DISCONNECTED (1D)
2. USE OF 5-MIN. ESCAPE PACKS RATHER THAN AIR LINE EQUIPMENT. (4A)
3. LIFE LINE, HARNESS, ETC. NOT USED (4B)
4. AIR MOVER FOR VENTILATION NOT ALWAYS USED ON GAS SIDE - DEPENDENCE ON NATURAL DRAFT. (3A)

OPERATIONS REP: _____

MAINTENANCE REP: _____

REVISED: JML
02/18/92
BLOCK #369

TEXT BLOCK # 369

HRU-300/400 BOILER ENTRY SUPPLEMENT

COMPLETION OF THIS SUPPLEMENT COVERS ITEMS PECULIAR TO THIS EQUIPMENT AND NOT NECESSARILY INCLUDED IN THE MULTI-PERMIT. IN ADDITION TO AND AS ATTACHMENTS TO THIS CHECKLIST, THE STANDARD VESSEL ENTRY PERMIT MUST BE ISSUED WITH AREAS NOTED THAT DO NOT APPLY.

		YES	NO
1.	BOILER IS DRAINED AND DRAIN VALVES TAGGED OPEN.	_____	_____
2.	HP, MP, AND LP NON-RETURN VALVES ARE CLOSED AND TAGGED.	_____	
3.	HP, MP, AND LP STEAM LEAD LINE VALVES ARE CLOSED AND RED TAGGED.	_____	
4.	HP, MP, AND LP LEAD LINE WARM-UP VALVES ARE CLOSED AND RED TAGGED.	_____	
5.	HP, MP, AND LP LEAD LINE VENTS AND DRAINS ARE OPEN.	_____	
6.	ALL FEEDWATER BLOCK AND BYPASS VALVES ARE CLOSED AND RED TAGGED.	_____	_____
	ALL CONDENSATE TO UNIT DOUBLE BLOCK AND BLEED AND RED TAGGED.	_____	_____
7.	ALL ECONOMIZER INLET BLOCK VALVES ARE CLOSED AND RED TAGGED OR RACK OUT AND RED TAG ALL BOILER FEED PUMPS.	_____	
8.	FUEL GAS SUPPLY LINE DOUBLE BLOCK, BLEED AND RED TAGGED.	_____	
9.	CHEMICAL FEED LINES DOUBLE BLOCK AND BLEED OR DISCONNECTED AND RED TAGGED.	_____	
10.	STEAM INJECTION LINE DOUBLE BLOCK AND BLEED AND RED TAGGED.	_____	_____
11.	ANY OBSTRUCTION TO NATURAL DRAFT FOR VENTILATION.	_____	_____
12.	LOW VOLTAGE OR GROUND FAULT PROTECTED LIGHTING AVAILABLE.	_____	
13.	SAFETY OBSERVER WILL HAVE FIVE (5) MINUTE ESCAPE PACKS FOR EACH PERSON INSIDE THE VESSEL AND ONE FOR HIM/HER SELF.	_____	
14.	INDIVIDUAL CRAFTS HAVE SIGNED THE APPROPRIATE RED TAG MASTERS.	_____	
15.	CRAFT SAFETY MEETING HAS BEEN CONDUCTED.	_____	_____
16.	STEAM/WATER SIDE ENTRY.	_____	_____
17.	GAS SIDE ENTRY.	_____	_____

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CONFIDENTIAL

19. THE SAFETY OBSERVER IS A CERTIFIED HOLE WATCH. _____

20. THE SAFETY OBSERVER HAS A HOLE WATCH CARD. _____

EXCEPTIONS TO STANDARD:

NOTE: ALL NEED NOT BE COMPLETED FOR EITHER A BOILER ENTRY OR AN HRU ENTRY.

1. VALVES, INSTRUMENTS, INSTRUMENT LINES NOT DISCONNECTED (1D)
2. USE OF5-MIN. ESCAPE PACKS RATHER THAN AIR LINE EQUIPMENT. (4A)
3. LIFE LINE, HARNESS, ETC. NOT USED (4B)
4. AIR MOVER FOR VENTILATION NOT ALWAYS USED ON GAS SIDE - DEPENDENCE ON NATURAL DRAFT. (3A)

OPERATIONS REP: _____

MAINTENANCE REP: _____

REVISED: NLC
11/13/91
BLOCK #369

TEXT BLOCK # 407

ISOLATING AND REMOVING SUCTION STRAINER FROM 300/400 BOILER FEED PUMPS

NOTE: THE BOILER FEED PUMP THAT THE STRAINER IS TO BE REMOVED MUST BE SHUT-DOWN.

1. ON A SHUTDOWN BFP, RED TAG THE MAIN BREAKER, LOCAL START SWITCH, AND THE CONTROL ROOM SWITCH.

2. CLOSE THE TWO SUCTION BLOCK VALVES, RED TAG BOTH OF THESE VALVES.

3. OPEN VALVE ON SUCTION STRAINER TO DEPRESSURIZE THE STRAINER HOUSING.

4. ONCE STRAINER HOUSING HAS BEEN DEPRESSURIZED, THE NUTS ON THE HOUSING CAN BE LOOSENED.

5. BE CAREFUL THE STRAINER AND OUTER BLIND ON THE HOUSING IS USUALLY HOT AND HEAVY.

6. WHEN THE STRAINER HAS BEEN REMOVED, IT CAN BE CLOSELY INSPECTED AND CLEANED. ALSO INSPECT THE STRAINER HOUSING FOR FOREIGN MATERIAL.

7. ONCE INSPECTION AND CLEANING IS COMPLETE, THE STRAIN CAN BE PUT BACK IN PLACE. USE A NEW GASKET AND USE THE PROPER NUT TIGHTENING TECHNIQUE.

REVISED: NLC
9/13/90
BLOCK #407

DO A 134061
CONFIDENTIAL

TEXT BLOCK # 435

PRE-STARTUP CHECKLIST FOR UNITS 300/400

		YES	NO
1.	UNIT HAS BEEN ON TURNING GEAR (MINIMUM ONE HOUR).	_____	_____
2.	H.P., M.P., L.P. BOILER LEADLINE VENTS ARE OPEN IN THE CROW'S NEST AND LEAD LINES NEAR OPERATING TEMPS.	_____	_____
3.	D.A. IN SERVICE	_____	_____
4.	BLOCK ELECTROMATIC VALVE.	_____	_____
5.	ARE ALL THREE STEAM NON-RETURN AND LEAD LINE VALVES OPEN, ALSO SUPERHEATER VENTS.	_____	_____
6.	ENSURE GAUGE GLASSES ARE UNBLOCKED.	_____	_____
7.	H.P., M.P., L.P. BOILER LEAD LINE DRAINS ARE CRACKED OPEN ON THE SOUTHSIDE OF THE H.R.U.	_____	_____
8.	ESTABLISH FLOW ON CASING VENTS (3) OF B.F.P.'S AND A AND B AND BRING TO NEAR OPERATING TEMP.	_____	_____
9.	CHEMICAL FEED PUMPS WORKING PROPERLY.	_____	_____
10.	ESTABLISH FLOW THROUGH H.P. AND M.P. SUPERHEATER DRAINS.	_____	_____
11.	UNBLOCK DA OVERFLOW (AUTOMATIC) VALVE.	_____	_____
12.	H.P. SAMPLE LINE TO COOLER BLOCKED.	_____	_____
13.	HAVE LUBE OIL PUMPS AND PIPING BEEN CHECKED FOR LEAKS? ARE PUMPS IN AUTO?	_____	_____
14.	IS THE D.A. LEVEL CONTROLLER BLOCKED?	_____	_____
15.	IS HOT END SNUFFING STEAM UNBLOCKED AND RESET?	_____	_____
16.	H2 COOLING WATER AND EXCITER COOLING WATER UNBLOCKED.	_____	_____
17.	H2 PRESSURE ON THE GENERATOR IS 21 TO 26 LBS.	_____	_____
18.	STEAM INJECTION IS HOT UP TO THE CONTROL VALVE.	_____	_____
19.	FUEL GAS IS PRESSURED UP TO THE SHUTOFF VALVE.	_____	_____
20.	CONDENSATE RETURN LINE IS UNBLOCKED AND NORMAL.	_____	_____
21.	LUBE OIL RESERVOIR LEVEL IS ABOUT 1'6" (LEVEL WILL RISE WHEN MACHINE STARTS).	_____	_____
22.	ALL TURBINE VENT FANS ARE IN AUTO POSITION.	_____	_____
23	CHECK ALL HRU SECTION DOORS AND TURBINE INLET AND EXHAUST DOORS. THEY SHOULD ALL BE CLOSED.	_____	_____
24	IS STEAM INJECTION STARTUP PROCEDURE BEING	_____	_____

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CONFIDENTIAL

22. ALL TURBINE VENT FANS ARE IN AUTO POSITION. _____ _____

23 CHECK ALL HRU SECTION DOORS AND TURBINE INLET AND EXHAUST DOORS. THEY SHOULD ALL BE CLOSED. _____ _____

24. IS STEAM INJECTION STARTUP PROCEDURE BEING FOLLOWED? _____ _____

25. LUBE OIL TEMPERATURE IS 90 DEGF. OR ABOVE. _____ _____

26. LUBE OIL COOLER IS UNBLOCKED. _____ _____

27. ALL SWITCHES IN THE PS & G CABINET IN THE MECHANICAL PACKAGE ARE IN AUTO POSITION. _____ _____

28. CHECK TO SEE IF LUBE OIL AND SEAL OIL EVACTORS ARE ON AUTO. _____ _____

29. IS BACKUP SEAL AIR UNBLOCKED. SEAL? _____ _____

30. HAVE ALL RED TAGS PERTAINING TO THE MACHINE BEEN CLEARED AND PULLED? _____ _____

31. ENSURE ALL CHARTS ARE INKING AND WORKING PROPERLY. _____ _____

32. ANNUNCIATOR LAMPS CHECKED? _____ _____

33. ARE ALL BOILER DRUMS AT PROPER FIRING LEVEL? _____ _____

34. CHECK CONDENSATE PUMPS FOR GOOD SUPPLY OF WATER. IS THERE ENOUGH PUMPS RUNNING? _____ _____

35. HAVE POWER 1, CHLORINE AND PIPELINE BEEN NOTIFIED OF THIS STARTUP? _____ _____

36. CHECK ALL ANNUNCIATOR CARDS TO INSURE THEY ARE ALL IN. _____ _____

37. IGV'S CLOSED AND CONTROLLER ON MANUAL. ALSO SELECTOR ON WOODY. _____ _____

38. ESTABLISH CONDENSATE FLOW THRU FEEDWATER PREHEATER. _____ _____

REVISED: JML
07/02/91
BLOCK #435

DO A 134063
CONFIDENTIAL

TEXT BLOCK # 437

TAKING UNIT 300 OR UNIT 400 ELECTROMATIC RELIEF VALVE OUT OF SERVICE

1. PUT ELECTROMATIC RELIEF VALVE SWITCH IN THE OFF POSITION. THIS SWITCH IS LOCATED ON BOILER BOARD (300/400) IN THE CONTROL ROOM. RED TAG THIS SWITCH.

2. OPEN THE SWITCH THAT SUPPLIES POWER TO THE RELIEF VALVE. THIS SWITCH IS LOCATED IN IPP IPP-DC 300. BREAKERS #4 AND #6 IN THE INVERTER ROOM. RED TAG THIS SWITCH OPEN.

3. CLOSE THE MAIN BLOCK VALVE TO THE ELECTROMATIC RELIEF VALVE. RED TAG THIS VALVE CLOSED.

4. CLOSE ELECTROMATIC RELIEF VALVE SENSING LINE BLOCK VALVE. THIS VALVE IS LOCATED AWAY FROM THE WALKWAY AND HANDRAILS. BE CAREFUL WHEN OPERATING THIS VALVE. RED TAG THIS VALVE.

REVISED: JML
07/02/91
BLOCK #437

REMOVING, REBUILDING, AND REINSTALLING HRU 100/200 GAUGE GLASSES

REMOVING THE GAUGE GLASS FROM SERVICE

1. BLOCK IN THE UPPER (STEAM SIDE) GAUGE GLASS BLOCK VALVE AND THEN BLOCK IN THE LOWER (WATER SIDE) GAUGE BLOCK VALVE. RED TAG BOTH VALVES.

2. OPEN THE DRAIN TO ATMOSPHERE TO DRAIN AND DEPRESSURIZE. RED TAG OPEN.

3. AFTER THE GAUGE GLASS IS DRAINED AND DEPRESSURIZED, ALLOW SUFFICIENT TIME FOR IT TO COOL OFF BEFORE ATTEMPTING TO REMOVE IT.

4. REMOVE THE GAUGE GLASS BY REMOVING THE UPPER AND LOWER PACKING NUTS AND LIFT THE GAUGE GLASS UP AND OUT. GAUGE GLASS MAY NOW BE TAKEN TO SHOP TO REPLACE THE PRISMATIC GLASS.

DISASSEMBLING GAUGE GLASS

NOTE: BEFORE ATEMPTING TO LOOSEN RETAINING NUTS, IT WOULD BE A GOOD IDEA TO SOAK THEM WITH PENETRATING OIL AND LET STAND FOR 10-15 MINUTES.

1. REMOVE NUTS, WASHERS, AND IRON CLAMPS. NOTE HOW THE CLAMPS ARE POSITIONE ON THE GAUGE GLASS, SHORT SIDE OF THE CLAMP ON THE COVER PLATE.

2. REMOVE GAUGE GLASS COVER PLATE AND OUTER GASKET.

3. REMOVE PRISMATIC GLASS TAKING CARE TO NOTICE ANY BREAKS OR CRACKS IN THE GLASS.

4. REMOVE INNER GASKET FROM GAUGE GLASS BODY.

5. THOROUGHLY CLEAN THE GASKET SEATS ON THE GAUGE GLASS BODY AND THE COVER PLATE. THE SURFACES SHOULD BE SMOOTH AND FREE OF ANY SCRATCHES. ANY IRREGULARITIES IN THE SURFACES CAN CAUSE THE GLASS TO SHATTER AS IT IS BEING TIGHTENED.

6. CLEAN THE MACHINE BOLT THREADS. IF USING A BENCH GRINDER WITH A WIRE WHEEL, USE VISE GRIPS TO HOLD THE BOLTS TO PREVENT KICKBACK OR WHEEL DRAW. LUBRICATE THE BOLT THREADS WITH FEL-PRO WHEN FINISHED.

REASSEMBLING THE GAUGE GLASS

1. CENTER THE NEW INNER GASKET IN THE GAUGE GLASS BODY.

2. CENTER THE NEW PRISMATIC GLASS ON THE INNER GASKET.

3. PLACE THE NEW OUTER GASKET AND COVER PLATE OVER THE GLASS.

4. REPLACE THE CLAMPS, WASHERS, AND NUTS.

5. TIGHTEN ALL NUTS FINGER TIGHT. THEN FOLLOWING THE TIGHTENING SEQUENCE, (STARTING AT CENTER PAIR OF NUTS, TIGHTEN IN ALTERNATE PAIRS TO EITHER END), TIGHTEN EACH NUT ONE FLAT AT A TIME UNTIL SNUG. USING A TORQUE WCH, TORQUE THE NUTS TO 40 FOOT POUNDS FOLLOWING THE TIGHTENING SEQUENCE.

6. GAUGE GLASS MAY NOW BE REINSTALLED ON THE HRU.

DO A 134065
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PUTTING THE GAUGE GLASS BACK IN SERVICE

1. REPLACE BOTH UPPER AND LOWER RUBBER PACKING AND METAL WASHER.

2. REINSTALL GAUGE GLASS ON THE HRU IN THE REVERSE SEQUENCE OF REMOVING THE GAUGE GLASS FROM SERVICE.

3. PREHEAT GAUGE GLASS BY OPENING DRAIN VALVE AND CRACKING OPEN THE UPPER (STEAM SIDE) BLOCK VALVE. THIS ALLOWS A SMALL FLOW OF STEAM THROUGH GAUGE GLASS BODY BRINGING IT UP TO OPERATING TEMPERATURE.

4. WHEN GAUGE GLASS IS THOROUGHLY HEATED, RETORQUE GAUGE TO FULL TORQUE AFTER GAUGE IS WARMED UP TO OPERATING TEMPERATURE (APPROX. 10 MINS.) WITH ISOLATION VALVES CLOSED AND DRAIN VALVE OPEN.

5. WHEN THE GAUGE GLASS IS THOROUGHLY HEATED, CLOSE THE DRAIN VALVE AND SLOWLY OPEN THE UPPER (STEAM SIDE) AND LOWER (WATER SIDE) BLOCK VALVES. DO NOT STAND IN FRONT OF GAUGE GLASS WHEN OPENING THE BLOCK VALVES AS THERE IS A POSSIBILITY OF THE GAUGE GLASS BLOWING OUT DUE TO DEFECT OR INADEQUATE WARM UP.

6. GAUGE GLASS IS BACK IN SERVICE

7. CLEAN UP AREA AND PLACE TOOLS BACK IN LOCKER.

TOOLS REQUIRED TO REBUILD GAUGE GLASS

1. 5/8" WRENCH
2. 11/16/ WRENCH
3. TORQUE WRENCH AND 11/16" SOCKET
4. GRINDER WITH WIRE WHEEL
5. SCREWDRIVER
6. HAMMER

REVISED: NLC
01/27/92
BLOCK #459

UPDATED: JML
07/30/93

DO A 1340[illegible]
CONFIDENTIAL

TEXT BLOCK # 461

FILLING BOILERS HRU-300 AND 400

THE PURPOSE OF THIS PROCEDURE IS FOR FILLING BOILERS AFTER THEY HAVE BEEN DRAINED FOR REPAIR OR INSPECTION OF TUBES.

ALL WORK MUST BE COMPLETED AND RED TAG MASTERS CLEARED BEFORE ANY WORK CAN BE PERFORMED TO FILL BOILERS. ALL DRUM AND BOILER DOORS SHOULD BE CHECKED TO MAKE SURE NO PERSONNEL ARE STILL INSIDE VESSEL BEFORE CLOSING. YELL INSIDE VESSEL PRIOR TO CLOSING.

CHECK AND CLOSE ALL DRAIN VALVES ON HRU INCLUDING HP AND MP SUPER-HEATER DRAINS IF NYDRO-TESTING IS TO BE PERFORMED.

OPEN ALL VENTS ON TOP HRU, INCLUDING SUPERHEATER VENTS. OPEN HP AND MP ECONOMIZER BLOCK VALVES. OPEN PREHEATER FILL AND CLOSE VENTS ON FILL LINE. CHECK PREHEATER DRAINS AND CLOSE.

INSTALL SPOOLS ON HP AND MP FEEDWATER REGULATOR LINES AND OPEN CONTROL LOOPS AND SPOOL BLOCK VALVES.

BLOCK IN HYDROSTATING BLOCK VALVES FROM UNIT ON LINE AT BOTH CONTROL LOOPS. DO NOT ATTEMPT TO FILL WITH THIS LINE, VALVES WILL BE DAMAGED.

MAKE SURE YOU HAVE ENOUGH MAKE-UP PUMPS FOR FILLING WITHOUT UPSETTING UNITS ON LINE. IF YOU NEED ANOTHER MUP CALL POWER I BEFORE STARTING.

OPEN CONDENSATE TO UNIT TO BE FILLED AND CALL BOARD OPERATOR. AFTER CONDENSATE FLOW HAS BEEN ESTABLISHED, OPERATOR SHOULD LOOK FOR LEAK OR DRAINS LEFT OPEN.

BOARD OPERATOR CAN OPEN FEEDWATER REGULATORS TO HP, MP, AND LP BOILERS. FLOW WILL BE INDICATED BY FEEDWATER PREHEATER FLOW AND TOTAL CONDENSATE FLOW TO POWER II. THIS SHOULD BE WATCHED CLOSELY AS NOT TO TAKE TOO MUCH CONDENSATE FROM UNITS ON LINE.

*IF HYDRO-TESTING IS TO BE PERFORMED, AN OPERATOR SHOULD BE STATIONED ON TOP HRU AFTER LEVEL IS SHOWN ON CONTROL BOARD TO CLOSE AND COM-MUNICATE TO CONTROL ROOM WHEN CONDENSATE COMES OUT VENTS.

*NOTE: FOR HYDRO-TESTING ONLY.

REVISED: NLC
9/13/90
BLOCK #461

DO A 134067
CONFIDENTIAL

TEXT BLOCK # 492

UNIT 300/400 HIGH PRESSURE FEEDWATER REGULATOR FAILURE

IN THE EVENT THE LEVEL IN 300/400 HIGHPRESSURE DRUM STARTS RISING UNCONTROLLABLY, PUT THE FEEDWATER REGULATOR IN "MANUAL" AND TRY CLOSING IT. IF INDEED THE REGULATOR HAS FAILED, TURN THE HIGH PRESSURE FEEDWATER MOV TO "CLOSE". WHILE THE VALVE IS CLOSING, WATCH THE FEEDWATER FLOW ON THE CHART AND WHEN IT STARTS COMING DOWN, START OPENING THE HIGH PRESSURE FEEDWATER BYPASS MOV TO THROTTLE THE FLOW. WHEN THE LEVEL SETTLES OUT, GET AN INSTRUMENT MAN TO CHECK THE FEEDWATER REGULATOR.

NOTE: IF THE HIGH PRESSURE FEEDWATER MOV FAILS TO STOP THE RISING DRUM LEVEL, THE MANUAL BLOCK VALVE AT THE REGULATOR CAN BE CLOSED.

REVISED: NLC
9/13/90
BLOCK #492

DO [illegible]
CONFIDENTIAL

TEXT BLOCK # 498

300/400 FEEDWATER PREHEATER FERROUS SULFATE/
COPPER SULFATE REMOVAL AND DISPOSAL

REMOVAL OF MATERIAL FROM FEED WATER HEATER

1. INDOCTRINATE ALL PERSONNEL INVOLVED AS TO THE HAZARDS OF THE BLOCK AND THE HAZARDS OF THE JOB. THE HAZARDS OF THE JOB INCLUDE COPPER SULFATE AND FERROUS SULFATE. THE INDOCTRINATIN WILL INCLUDE HYGIENE PORTION OF THE MSDS SHEETS. (WASH THEIR HANDS, NOT PUT IT IN THEIR MOUTHS, WASH ANY EXPOSED AREAS AND WHAT TO DO IF EXPOSED TO THE MATERIAL).

   ALL PERSONNEL WHO WORK ON THE JOB MUST HAVE BEEN PRE-MEDICAL APPROVED TO WEAR RESPIRATORY PROTECTION. FIT TESTING IS REQUIRED ON ALL MASKS (COMFO II, DUST MASK, ETC).

   THE TLV OF COPPER SULFATE IS 1 MG/M3
   THE TLV OF FESO4 IS 1 MG/M3/

2. THE SCAFFOLD CREW WILL THEN BUILD A SCAFFOLD SO THAT THE SANDBLASTER CAN BLAST THE MATERIAL OFF THE TUBES. THE SCAFFOLD CREW WILL WEAR THE FOLLOWING EQUIPMENT WHEN INSIDE THE VESSEL.

   (1). PAPER SUIT
   (2). NITRITE GLOVES
   (3). RUBBER BOOTS
   (4). MONOGOGGLES
   (5). DUST MASK (NOTE: MAKE SURE THEY HAVE BEEN FIT TESTED)

3. THE SAND BLASTER DOING THE WORK WILL WEAR THE FOLLOWING EQUIPMENT:

   (1). PAPER SUIT
   (2). NITRITE GLOVES
   (3). RUBBER BOOTS
   (4). MONOGOGGLES
   (5). A HOOD WITH BREATHING AIR AND A DUST MASK

   THE SANDBLASTER WILL LIGHTLY SWEEP THE TUBES TO REMOVE THE MATERIAL.

   NOTE: DURING THE TIME THE SANDBLASTER AND THE CLEAN UP PEOPLE ARE WORKING, OXYGEN LEVELS WILL BE TAKEN EVERY 30 MINUTES. THESE OXYGEN LEVELS WILL BE RECORDED ON A FORM AND REVIEWED AT THE END OF THE JOB. IF AT ANY TIME THE OXYGEN LEVELS DROP BELOW 19%, HAVE THE PEOPLE QUIT BLASTING AND GET OUT OF THE VESSEL.

4. THE CLEAN UP PEOPLE WILL WEAR THE FOLLOWING EQUIPMENT:

   (1). PAPER SUIT
   (2). NITRITE GLOVES
   (3). RUBBER BOOTS
   (4). MONOGOGGLES
   (5). COMFO II OVAG WITH PREFILTER

   THE CLEAN UP WILL BE BY VACUUM TRUCK PULLING THE MATERIAL OUT OF THE FEED WATER HEATER SECTIONS. THIS WILL ALSO INVOLVE VACUUMING THE TUBES. THE MATERIAL WILL THEN BE AUGERED INTO BARRELS THAT WILL WEIGH NO MORE THAN 250 LBS.

WASTE DISPOSAL AND VACUUM TRUCK PROCEDURE

1. PLACE WATER IN 15 GALLON PACKS FILLED TO THE TOP AND PUT TOP ON TIGHTLY.

2. PLACE 4 DRUMS ON EACH PALLET.

LABEL THE DRUMS COPPER SULFATE/IRON SULFATE AND SAND
NON HAZARDOUS
WASTE TYPE - 2689
POWER 2
1/9/90 OR WHATEVER DATE

NOTE: THE FOLLOWING MUST BE DONE!

1. PACKS MUST BE FILLED TO THE TOP. THIS IS ALL PACKS NO MATTER HOW MUCH OTHER MATERIAL IS IN THE PACKS.

   EXAMPLE: IF THE PACK IS 1/4 FULL OR 3/4 FULL FILL UP THE REMAINING EMPTY PORTION WITH CATLITTER.

2. PUT THE TOPS ON THE PACKS. HOWEVER, ONCE THE PACKS ARE FILLED, IT WILL REQUIRE PACKS TO BE 100% INSPECTED. THIS MEANS THAT THE TOPS HAVE TO COME BACK OFF AND THE PACKS WILL BE INSPECTED BEFORE THEY GO TO LANDFILL. BECAUSE OF THE LARGE CHANCE OF RAIN AND THE WAY THIS MATERIAL ABSORBS WATER, IT WOULD BE ADVISABLE TO DELAY THIS UNTIL A LATER TIME.

WE WILL FILL IN THE WASTE TYPE NUMBER LATER.

3. ONCE ALL OF THE MATERIAL IS OUT OF THE TRUCK, HAVE IT OPENED AND SWEPT OUT IF THAT IS POSSIBLE. AFTER THAT RINSE THE TRUCK WITH AS LITTLE WATER AS POSSIBLE AND PUT THAT WATER INTO A FIBER PACK WITH ABSORBENT MATERIAL.

LABEL THAT PACK/PACKS WITH

WEAK ACID, GRANULAR ABSORBENT MATERIAL AND COPPER SALTS
WASTE TYPE # 1488
POWER II
1/9/90 OR WHATEVER DATE

ONCE THE TRUCK IS CLEANED, IT MAY BE RELEASED.

NOTE: MAKE SURE TRUCK IS CLEAN OR IT WILL COME BACK

REVISED: JML
07/03/91
BLOCK #498

DO A 134070
CONFIDENTIAL

HRU 300/400 FREEZE PRECAUTION (DOWN)

LEVEL I

1. BLOCK IN DOWNSTREAM BLOCK VALVE ON CONDENSATE SUPPLY. OPEN DRAIN SLIGHTLY TO KEEP LINE FLOWING.
2. OPEN HP, MP, AND LP BOILER DRUM VENTS.
3. OPEN HP, MP, AND LP BOILER DRAINS WIDE OPEN.
4. OPEN DA BOTTOM 3" DRAIN AND DA DUMP BYPASS.
5. CRACK OPEN STEAM TO DA USING PRESSURE CONTROL VALVE.
6. OPEN ALL BOILER SUPERHEATER VENTS.
7. OPEN ALL BOILER DRUM AND DA WATER COLUMN DRAINS.
8. OPEN ALL PREHEATER DRAINS - ALL TRAINS.
9. OPEN ALL ECONOMIZER DRAINS - ALL TRAINS.
   PLACE ALL FW REGULATORS ON MANUAL AND OPEN FULLY, INCLUDING BY-PASSES.
   OPEN ALL DRAINS ON BOTTOM OF FW REGULATORS.
10. OPEN ALL BFP DRAINS.
11. RACK OUT AND RED TAG BFP'S ELECTRICALLY.
12. OPEN ALL DOWN COMER DRAINS - ALL TRAINS.
13. OPEN VENTS ON ALL LEAD LINES TO KEEP LINES HOT TO NON-RETURN.
14. UNPLUG PO4 AND CORTROL PUMPS, DISCONNECT DISCHARGE LINES AT PUMP, DRAIN INTO BUCKET AND POUR BACK INTO BULK TANK.
15. BLOCK IN PO4 AND CORTROL BULK TANKS, DISCONNECT SUCTION LINE AT PUMP, DRAIN LINE INTO BUCKET, AND POUR INTO BULK TANKS.
16. INSURE SAMPLE COOLERS ARE WIDE OPEN TO DRAIN CBD LINES.
17. CRACK OPEN DRAINS UPSTREAM AND DOWNSTREAM OF CONTROL VALVE ON CONDENSATE RETURN TO POWER I SLIGHTLY TO KEEP LINE FLOWING ON THE POWER I SIDE AND TO DRAIN ON POWER II SIDE OF C/V.
18. CRACK OPEN MIXING TEE-DRAINS AND DEAERATOR LEVEL CONTROL DRAINS.

EDITED: JML
11/10/92
BLOCK #799

UPDATED: JMC
2/23/94

ISOLATING SUCTION LINE TO REMOVE STRAINERS FOR BFP 300/400-A/B

ISOLATING SUCTION LINE TO REMOVE STRAINER
(P-300 A/B & P-400 A/B)

TO ACCOMPLISH THIS JOB SAFELY, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:

1. SHUT THE PUMP DOWN (AS PER SAFE WORK PROCEDURE STARTING AND STOPPING BF PUMPS P-300 A&B AND P-400 A & B), IF IT IS RUNNING.
2. TAG THE CONTROL ROOM REMOTE SWITCH.
3. TAG THE LOCAL SWITCH.
4. RACK OUT AND RED TAG THE 4160 VOLT MOTOR BREAKER.
5. CLOSE AND RED TAG THE STRAINER UPSTREAM BLOCK VALVE.
6. CLOSE AND RED TAG THE STRAINERS DOWNSTREAM BLOCK VALVE.
7. OPEN THE DRAIN VALVE ON THE "Y" STRAINER AND RED TAG.

RETURNING TO SERVICE

1. CLOSE THE DRAIN VALVE ON THE "Y" STRAINER.
2. OPEN THE STRAINER'S UPSTREAM BLOCK VALVE.
3. OPEN THE STRAINERS DOWNSTREAM BLOCK VALVE.
4. RACK IN THE 4160 VOLT MOTOR BREAKER.
5. REMOVE THE LOCAL SWITCH RED TAG.
6. REMOVE THE CONTROL ROOM REMOTE SWITCH RED TAG.

REVISED: NLC
9/14/90
BLOCK #660

UPDATED: JML
12/09/93

DO A 13407
CONFIDENTIAL