

HRU 100/200

DO A 133972
CONFIDENTIAL

HRU 100/200 START-UP CHECKLIST

	YES	NO
1. ALL BLR. LEAD LINE AND NON RETURN BLOCK VALVES ARE OPEN.	_____	_____
2. HIGH PRESSURE AND MEDIUM PRESSURE SUPERHEATER VENTS ARE OPEN.	_____	_____
3. HIGH PRESSURE AND MEDIUM PRESSURE SUPERHEATER DRAINS ARE OPEN.	_____	_____
4. LOW PRESSURE BOILER DRUM VENT OPEN.	_____	_____
5. HIGH, MEDIUM AND LOW PRESSURE BOILER LEAD LINE WARM UP VENTS OPEN.	_____	_____
6. STEAM ON D. A. AND DA VENT OPEN.	_____	_____
7. CONTROL PUMPS RUNNING.	_____	_____
8. ALL BOILER DRUM LEVELS AT FIRING LEVEL.	_____	_____
9. HIGH PRESSURE CONTINUOUS BLOWDOWN BLOCKED IN.	_____	_____
10. NORMAL OPERATING LEVEL IN D. A. AND BLOCK VALVES TO D. A. LEVEL CONTROLLER OPEN.	_____	_____
11. CONDENSATE BLOCK VALVES TO BOILER FLASH TANK CLOSED.	_____	_____
12. DRAIN FROM INTERNAL STEAM LOOP IN D. A. OPEN.	_____	_____
13. ALL FEEDWATER REGULATORS UNBLOCKED.	_____	_____
14. LOW PRESSURE BOILER FEED PUMPS UNBLOCKED.	_____	_____
15. COOLING WATER SUPPLY AND RETURN OPEN ON HIGH PRESSURE BOILER FEED PUMP SEAL COOLERS.	_____	_____
18. COOLING WATER SUPPLY AND RETURN OPEN ON BLR. SAMPLE COOLERS.	_____	_____
19. ARE THERE SUFFICIENT MAKE UP PUMPS RUNNING TO START THIS UNIT.	_____	_____

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07/02/91

BLOCK# 19

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HRU 100/200 HP BOILER HYDRO TEST TO CONDENSATE PRESSURE

A. RED TAG H.P. PUMPS ELECTRICALLY TO INSURE THEY DO NOT START DURING THE HYDRO.

B. THE FOLLOWING VENTS MUST BE OPEN:

1. HP DRUM VENTS
2. HP SUPERHEATER VENT
3. HP VENT BETWEEN NON-RETURN AND LEADLINE (IN CASE NON-RETURN LEAKS)

C. THE FOLLOWING VALVES MUST BE CLOSED PRIOR TO FILLING HP BOILER FOR HYDRO:

1. UPSTREAM WARM-UP BLOCK VALVE AROUND LEAD LINE BLOCK VALVE
2. ALL HP BOILER DRAINS
3. ALL HP SUPERHEATER DRAINS
4. HP CONTINUOUS BLOWDOWN
5. HP NON RETURN
6. HP LEAD LINE
7. BLOCK VALVE UPSTREAM OF LP REGULATOR
8. LP FEEDWATER BY-PASS BLOCK VALVE
9. MP FEEDWATER REGULATOR BLOCK VALVE
10. NP FEEDWATER BY-PASS
11. HP FEEDWATER BY-PASS
12. HP FEEDWATER TRICKLE FEED

D. THE FOLLOWING VALVES MUST BE OPEN PRIOR TO FILLING:

1. HP RFP SUCTION
2. HP RFP DISCHARGE
3. HP FEEDWATER REGULATOR BLOCK VALVE
4. HP ECONOMIZER INLET

E. FILLING FOR HYDRO:

1. OPEN HYDRO VALVES (LOCATED ON THE NORTH AND SOUTH SIDES OF UNITS TAKING OFF OF 2 H2O LINES) THEN OPEN HP FEED H2O REGULATOR AND ESTABLISH FLOW TO HP BOILER. BE SURE DRAIN VALVES ON HYDRO LINES ARE PRE-BLOCKED.
2. YOU SHOULD BE FILLING AT THIS TIME.
3. WHEN DRUM LEVEL STARTS TO RISE, HAVE OPERATOR PROCEED TO TOP OF BOILER.
4. BOARD OPERATOR WILL NOTIFY OUTSIDE OPERATOR WHEN DRUM SHOWS A HIGH LEVEL ON CONTROL BOARD.
5. WHEN WATER COMES OUT OF DRUM VENT, CLOSE DRUM VENT.
6. CONTINUE TO FILL UNTIL YOU GET WATER OUT OF SUPERHEATER VENT. CLOSE VENT AND INFORM BOARD OPERATOR.

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F. HYDRO BY PRESSURING HP BOILER TO CONDENSATE PRESSURE USING CONDENSATE FILL LINE.

1. MONITOR HP BOILER AT CONDENSATE PRESSURE FOR ONE HOUR, THEN INSPECT FOR LEAKS.
2. AFTER INSPECTION OF HP BOILER, IF NO LEAKS ARE FOUND, CLOSE FILL LINE AND OPEN BLEEDS, THEN DEPRESSURE BOILER AND PREPARE BOILER FOR START-UP.

NOTE: OPEN SUPERHEATER VENTS AND DRAIN TO INSURE THAT THE SUPERHEATER

IS COMPLETELY DRAINED BEFORE START-UP.

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HRU 100/200 MP BOILER HYDRO TEST TO 40#

A. THE FOLLOWING VENTS MUST BE OPEN:

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

B. THE FOLLOWING VALVES MUST BE CLOSED PRIOR TO FILLING MP BOILER FOR HYDRO:

1. UPSTREAM WARM-UP BLOCK VALVE AROUND LEAD LINE BLOCK VALVE
2. ALL MP BOILER DRAINS
3. MP CONTINUOUS BLOWDOWN
4. MP NON-RETURN
5. MP LEAD LINE
6. LP FEEDWATER BY-PASS BLOCK VALVE AND REGULATOR BLOCK VALVE
7. MP FEEDWATER REGULATOR
8. MP TRICKLE FEED BLOCK VALVE
9. MP FEEDWATER BY-PASS

C. THE FOLLOWING VALVE MUST BE OPEN PRIOR TO FILLING:

1. MP FEEDWATER BLOCK VALVE

D. FILLING FOR HYDRO:

1. OPEN HYDRO VALVES (LOCATED ON THE NORTH AND SOUTH SIDES OF UNITS TAKING OFF OF GLAND H2O LINES) AND OPEN MP FEEDWATER REGULATOR AND ESTABLISH FLOW TO MP BOILER. BE SURE DRAIN VALVE IN HYDRO LINE IS BLOCKED).
2. YOU SHOULD BE FILLING AT THIS TIME.
3. WHEN DRUM LEVEL STARTS TO RISE, HAVE OPERATOR PROCEED TO TOP OF BOILER.
4. BOARD OPERATOR WILL NOTIFY OUTSIDE OPERATOR WHEN DRUM SHOWS A HIGH LEVEL ON CONTROL BOARD.
5. WHEN WATER COMES OUT OF DRUM VENT, CLOSE DRUM VENT AND TELL DOWN-STAIRS OPERATOR THAT YOU HAVE GOTTEN WATER OUT OF DRUM VENT.
6. CONTINUE TO FILL UNTIL YOU GET WATER OUT OF SUPERHEATER VENT. CLOSE SUPERHEATER VENT.

E. HYDRO BY PRESSURING MP BOILER TO 40# USING 120 TO 130 CONDENSATE PRESSURE.

1. EXTREME CAUTION SHOULD BE TAKEN AT THIS TIME NOT TO BLOW MP SAFETY (SET AT 135#).
2. MONITOR MP BOILER AT 40# FOR ONE HOUR, THEN INSPECT FOR LEAKS.
3. AFTER INSPECTION OF MP BOILER, IF NO LEAKS ARE FOUND, DEPRESSURE BOILER AND PREPARE BOILER FOR START-UP.

OPEN SUPERHEATER VENTS AND DRAIN TO INSURE THAT THE SUPERHEATER IS COMPLETELY DRAINED BEFORE START-UP.

NOTE: HAVE BOARD OPERATOR CLOSE M.P. FEED H2O REGULATOR WHEN M.P. BOILER REACHES 40 PSIG. (IF PRESSURE CONTINUES TO RISE, CLOSE THE UPSTREAM BLOCK VALVE AT M.P. FEED H2O REGULATOR.

HRU 100/200 LP BOILER HYDRO TEST TO 40#

A. THE FOLLOWING VENTS MUST BE OPEN:

1. LP DRUM VENTS
2. LP VENT BETWEEN NON-RETURN AND LEAD LINE (IN CASE NON-RETURN LEAKS)

B. THE FOLLOWING VALVES MUST BE CLOSED PRIOR TO FILLING LP BOILER FOR HYDRO:

1. UPSTREAM WARM-UP BLOCK VALVE AROUND LEAD LINE BLOCK VALVE
2. ALL LP BOILER DRAINS
3. LP CONTINUOUS BLOWDOWN
4. BLOCK VALVE UPSTREAM OF MP REGULATOR
5. MP FEEDWATER BY-PASS
6. LP NON-RETURN
7. LP LEAD LINE
8. LP FEEDWATER BY-PASS
9. BLOCK VALVE UPSTREAM OF HP REGULATOR
10. HP FEEDWATER BY-PASS
11. HP TRICKLE FEED BLOCK VALVE
12. LP BFP DISCHARGE B/V'S

C. THE FOLLOWING VALVES MUST BE OPEN PRIOR TO FILLING:

1. LP FEEDWATER BLOCK VALVE

HRU 100/200 LP HYDRO TEST

D. FILLING FOR HYDRO:

1. OPEN HYDRO VALVES (LOCATED ON THE NORTH AND SOUTH SIDES OF UNIT TAKING OFF OF GLAND H2O LINES) AND OPEN LP FEED H2O REGULATOR TO ESTABLISH FLOW TO LP BOILER. BE SURE DRAIN VALVES ARE CLOSED ON HYDRO LINE.
2. YOU SHOULD BE FILLING AT THIS TIME.
3. WHEN DRUM LEVEL STARTS TO RISE, HAVE OPERATOR PROCEED TO TOP OF BOILER.
4. BOARD OPERATOR WILL MONITOR BOTH DRUM LEVEL INDICATORS AND NOTIFY OUTSIDE OPERATOR WHEN DRUM SHOWS A HIGH LEVEL ON CONTROL BOARD.
5. WHEN WATER COMES OUT OF DRUM VENT, CLOSE DRUM VENT AND TELL DOWNSTAIRS OPERATOR THAT YOU HAVE GOTTEN WATER OUT OF DRUM VENT.

E. HYDRO BY PRESSURING LP BOILER TO 40# USING CONDENSATE HEADER PRESSURE

1. EXTREME CAUTION SHOULD BE TAKEN AT THIS TIME NOT TO BLOW LP SAFETY (SET AT 135#)
2. HAVE DOWNSTAIRS OPERATOR CLOSE THE UPSTREAM BLOCK VALVE AT LOW PRESSURE FEEDWATER REGULATOR. AND BRING PRESSURE UP BY USING LP REGULATOR BY-PASS. LP REGULATOR BY-PASS. AT ABOUT 20 PSIG, CLOSE OP REGULATOR BY-PASS VALVE AND WATCH THE DRUM PRESSURE. IF THE PRESSURE CONTINUES TO RISE, BLOCK IN FEED H2O REGULATOR.
3. THE OPERATOR AT THE LP FEEDWATER REGULATOR WILL CONTROL PRESSURE ON THE BOILER AT 40 PSIG BY USING LP REGULATOR BY-PASS, STAYING IN CLOSE CONTACT WITH THE OPERATOR ON TOP MONITORING DRUM PRESSURE SINCE THAT IS THE ONLY PRESSURE INDICATION ON LP BOILER.

MAINTAIN LP BOILER AT 40# FOR ONE HOUR THEN INSPECT FOR LEAKS

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4. ~~MONITOR LP BOILER AT 50# FOR ONE HOUR THEN INSPECT FOR LEAKS.~~
5. AFTER INSPECTION OF LP BOILER, IF NO LEAKS ARE FOUND, DEPRESSURE BOILER AND PREPARE BOILER FOR START-UP.

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06/02/93

BLOCK #20

UPDATED: JMC

03/10/94

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SAFE WORK PROCEDURE

HRU START-UP (COLD) - UNIT 100/200

1. COMPLETE START-UP CHECKLIST.
2. OPEN VENTS - HP, MP, LP DRUMS, HP & MP SUPERHEATER VENTS, AND HP & MP LEAD LINE VENTS.
3. INSURE MUD DRUM BLOWDOWN ARE CLOSED. OPEN DRAINS ON H.P. AND WIDE OPEN M.P. SUPERHEATERS.
4. OPEN DA LOOP DRAIN.

NOTE: INSURE GOOD FLOW OF STEAM FROM DA LOOP DRAIN AND ALL WATER IS GONE AFTER STARTUP.

5. BRING DA LEVEL UP TO NORMAL. (SEE DA START-UP PROCEDURE).
6. UNBLOCK FEEDWATER REGULATORS. START LOW PRESSURE BOILER FEED PUMP AND BRING BOILERS UP TO FIRING LEVEL.
7. WARM UP STEAM LINES FROM 235# AND 30# PROCESS HEADERS BACK TO HRU NON-RETURNS.
8. OPEN HRU NON-RETURNS. INSURE THAT THEY ARE NOT LEAKING THROUGH AND PRESSURIZING BOILERS.
9. ONCE THE GT HAS FIRED, START LOW PRESSURE AND HIGH PRESSURE BOILER FEED PUMPS AND ADJUST BLOWDOWNS TO MAINTAIN DRUM LEVEL AT MINIMUM FOR THE H.P. PUMPS, INSURE ADEQUATE FLOW THROUGH THE PUMPS BY FLOW INDICATION ON FLOWCHART, USING THE TRICKLE FEED LINE ONLY UNTIL THE BOILER COMES ON THE LINE.
10. AFTER GT HAS FIRED, HRU DRUM LEVELS WILL BEGIN TO SWELL (USUALLY NOTICEABLE IN THE HP SECTION FIRST). BLOWDOWN AS NECESSARY TO PREVENT LEVEL FROM REACHING +5" ON INDICATOR.
11. AS UNITS BEGIN TO GENERATE STEAM AND DRUM LEVELS BEGIN FALLING, THE FEEDWATER REGULATORS MAY BE PLACED ON "AUTO" TO CONTROL DRUM LEVELS. GRADUALLY ADJUST SET POINTS FOR NORMAL LEVELS AND CLOSE TRICKLE. FEED ON HP.
12. CLOSE HRU VENTS AND DRAINS.
13. SET UP CONTINUOUS BLOWDOWNS, PLACE FLASH TANK IN SERVICE.
14. START PHOSPHATE PUMPS.

HRU START-UP (HOT)

1. PRIOR TO START-UP, BLOWDOWN DRUM LEVELS TO FIRING LEVEL (APPROXIMATELY 12") ON CONTROL ROOM LEVEL GAUGES.
2. OPEN SUPERHEATER DRAINS (HP AND MP SECTIONS)
3. PROCEED FROM STEP #9 ON HRU COLD START-UP PROCEDURE.

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12/14/93

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SAFE WORK PROCEDURE

HRU SHUTDOWN - UNIT 100/200 FOR AUXILIARY OPERATORS

1. ON SHUTDOWN OF THE GAS TURBINE, HRU FEEDWATER REGULATORS SHOULD BE PUT ON MANUAL AND CLOSED AFTER FILLING EACH BOILER, ADD 3/4 FULL.
2. SHUT DOWN BOILER FEED PUMPS.
3. OPEN VARIOUS HRU VENTS AND SUPERHEATER DRAINS. IF PLANS ARE TO RE-START AS SOON AS POSSIBLE, IT IS ONLY NECESSARY TO OPEN THE TWO DRAINS ON THE HIGH PRESSURE SUPERHEATER THUS MAINTAINING BOILER PRESSURES AS MUCH AS POSSIBLE.
4. BLOCK IN THE CONTINUOUS BLOWDOWN LINES TO THE FLASH-TANK AND SHUT OFF CONDENSATE TO THE HEAT EXCHANGER.
5. SHUT OFF CONDENSATE TO H. P. BOILER FEED PUMP GLAND COOLERS.

NOTE: NOTIFY BOARD OPERATOR TO HANG CAUTION TAGS ON CONTROL ROOM SWITCHES THAT CONDENSATE TO GLAND COOLERS IS BLOCKED OFF.

6. STOP THE CHEMICAL FEED PUMPS.
7. CLOSE THE THREE HRU NON RETURN VALVES, AS REQUIRED (NOT NECESSARY IF START-UP IS EXPECTED SHORTLY).

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TEXT #24

HRU-100/200 BOILER ENTRY SUPPLEMENT

THIS SUPPLEMENT IS REQUIRED FOR ANY VESSEL ENTRY IN THE HRU-100/200 STEAM DRUMS, RISER DRUMS, OR MUD DRUMS. THIS SUPPLEMENT MUST BE FILLED OUT EACH TIME A VESSEL ENTRY PERMIT IS ISSUED.

	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. STEAM INJECTION RED TAGGED WITH DOUBLE BLOCK AND BLEED	___	___
5. HP, MP AND LP STEAM LEADLINES RED TAGGED WITH DOUBLE BLOCK AND BLEED.	___	___
6. CONDENSATE TO HRU IS RED TAGGED WITH DOUBLE BLOCK AND BLEED.	___	___
7. CHEMICAL FEED LINES RED TAGGED WITH DOUBLE BLOCK AND BLEED.	___	___
8. CONDENSATE TO FLASH TANK RED TAGGED.	___	___
9. CONDENSATE TO HP BOILER FEED PUMPS GLAND COOLERS RED TAGGED.	___	___
10. HP AND LP BOILER FEED PUMPS TAGGED ELECTRICALLY.	___	___
11. STARTING MOTOR RED TAGGED	___	___
12. APPROPRIATE RED TAG MASTERS SIGNED.	___	___
13. BOARD OPERATOR WILL BE NOTIFIED OF ENTRY AND EXIT.	___	___
14. LOW VOLTAGE OR GROUND FAULT PROTECTED LIGHTING IS AVAILABLE.	___	___
15. SAFETY OBSERVER IS A CERTIFIED HOLE WATCHER.	___	___
16. SAFETY OBSERVER WILL HAVE APPROPRIATE NUMBER OF 5 MINUTE ESCAPE PACKS.	___	___
17. AIR MOVER USED FOR VENTILATION.	___	___

EXCEPTIONS TO STANDARD:

1. VALVES, INSTRUMENTS, INSTRUMENT LINES NOT DISCONNECTED.
2. USE OF FIVE (5) MINUTE ESCAPE PACKS RATHER THAN AIR LINE EQUIP.
3. LIFE LINE, HARNESS, ETC. NOT USED.

OPERATIONS REP: _____

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MAINTENANCE DEPT.

16. SAFETY OBSERVER WILL HAVE APPROPRIATE NUMBER
OF 5 MINUTE ESCAPE PACKS. _____

17. AIR MOVER USED FOR VENTILATION. _____

EXCEPTIONS TO STANDARD:

1. VALVES, INSTRUMENTS, INSTRUMENT LINES NOT DISCONNECTED.
2. USE OF FIVE (5) MINUTE ESCAPE PACKS RATHER THAN AIR LINE EQUIP.
3. LIFE LINE, HARNESS, ETC. NOT USED.

OPERATIONS REP: _____

MAINTENANCE REPR: _____

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1/28/92

BLOCK #24

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HRU-100/200 CHM FEED PMP-BLEEDING OF AIR

BLEEDING THE CHEMICAL FEED PUMPS OF AIR

1. BLEEDING THE PO4 PUMPS.

- A. TURN PUMPS OFF (H. P., L. P.)
- B. CLOSE DISCHARGE VALVE (A).
- C. OPEN BLEED VALVE (B).
- 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 (B).
- H. OPEN DISCHARGE (A).
- I. RESTART PUMP.

2. BLEEDING THE SO3 PUMPS

- A. TURN PUMP OFF.
- B. CLOSE DISCHARGE VALVE (A).
- C. REMOVE VALVE CAP (C).
- D. RESTART PUMP.
- E. ALLOW ALL AIR TO BLEED OUT UNTIL A STEADY PUMPING RHYTHM IS FOUND.
- F. STOP PUMP.
- G. REPLACE VALVE CAP (C).
- H. OPEN DISCHARGE VALVE (A).
- I. RESTART PUMP.

RE-INSTALLED: JML
10/03/90
BLOCK #25

TEXT BLOCK # 120

BOILERS 100/200

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. WHAT IS THE PURPOSE OF THE FEEDWATER PREHEATER?
10. EXPLAIN THE CONTINUOUS BLOWDOWN.
11. HOW IS OUR MANUAL BLOWDOWN SYSTEM?
12. IN PREPARATION FOR STARTUP, HOW MUCH WATER LEVEL SHOULD BE ESTABLISHED IN THE BOILERS?
13. HOW MANY INDICATORS OF DRUM LEVEL DO WE HAVE ON EACH BOILER?
14. HOW ARE THESE LEVELS CONTROLLED DURING STARTUP?
15. HOW SHOULD THE VARIOUS VENTS AND DRAINS BE SET UP PRIOR TO STARTUP?
16. WHEN SHOULD THEY BE CLOSED?
17. HOW DO YOU WARM UP THE STEAM LINES FROM THE HEADER TO THE NON-RETURN? WHY DO WE WARM THEM UP?
18. OF THE SAFETY VALVES ASSOCIATED WITH EACH BOILER, WHICH ONE OPENS FIRST AND WHY?
19. EXPLAIN THE CONDENSATE AND FEEDWATER SYSTEMS FOR HP, MP, AND LP BOILERS.
20. TRACE OUT THE LP, MP, AND HP STEAM SYSTEMS.

CHEMICAL FEED SYSTEM - 100/200

1. DESCRIBE THE SULFITE FEED SYSTEM.
2. DESCRIBE THE PHOSPHATE FEED SYSTEM.
3. WHY SHOULD THE SULFITE TEST BE RUN FIRST?
4. WHAT EFFECTS, IF 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?

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7. EXPLAIN WHAT TO DO WHEN THE P04 OR S04 PUMP STOPS PUMPING.
8. EXPLAIN HOW TO MEASURE THE FEED RATE FOR P04 AND S04 IN MILLILITERS PER MINUTE.
9. WHAT SHOULD THE MIXTURE OF THE CHEMICALS BE IN THE P04 AND S03 TANKS. (IN PERCENT)

BOILER FEED PUMPS 100/200

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 IS THE NORMAL SOURCE OF LUBE OIL FOR THE BOILER FEED PUMPS? FOR THE MOTOR?
5. WHAT IS THE SOURCE OF WATER FOR THE SEALS?
6. EXPLAIN THE PROCEDURE FOR ISOLATING AND RED TAGGING A BOILER FEED PUMP AND MOTOR. WHAT IF THE MOTOR IS TO BE WORKED ON?
7. WHAT DO YOU CHECK PRIOR TO STARTING UP A BOILER FEED PUMP?

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BLOCK #120

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TEXT BLOCK # 122

LUBE/POWER OIL SYSTEMS

1. WHERE ARE THE MAIN OIL PUMPS LOCATED? HOW ARE THEY DRIVEN?
2. HOW ARE THE OIL SYSTEMS SUPPLIED DURING START-UP AND SHUTDOWN?
3. LOCATE AND IDENTIFY EACH OF THE ELECTRIC MOTOR-DRIVEN OIL PUMPS.
4. WHAT ARE THE NORMAL PRESSURES FOR THE POWER OIL SYSTEMS?
5. WHAT IS THE NORMAL PRESSURE FOR THE LUBE OIL SYSTEM?
6. WHAT IS THE PURPOSE OF THE JACKING OIL SYSTEM?
7. HOW IS SUCTION SUPPLIED TO THE JACKING OIL PUMP?
8. WHAT IS THE NORMAL VACUUM ON THE LUBE OIL RESERVOIR? WHAT PROBLEMS CAN RESULT FROM LOSS OF VACUUM?
9. EXPLAIN HOW LUBE OIL TEMPERATURE IS CONTROLLED.
10. IS IT POSSIBLE TO SWITCH LUBE OIL AND POWER OIL FILTERS ON-LINE? EXPLAIN PROCEDURE.
11. HOW IS OIL FLOW MAINTAINED TO STARTING MOTOR BEARINGS FOR CORROSION PREVENTION DURING IDLE PERIODS?
12. HOW IS MOISTURE REMOVED FROM THE LUBE OIL RESERVOIR? EXPLAIN OPERATION OF THE CENTRIFUGE.

SEAL OIL SYSTEM

1. HOW IS SEAL OIL NORMALLY SUPPLIED?
2. EXPLAIN THE BACK-UP SYSTEMS.
3. WHAT IS THE NORMAL DIFFERENTIAL PRESSURE MAINTAINED ON THIS SYSTEM? HOW IS THIS DONE?
4. HOW CAN THIS DP BE CONTROLLED UPON FAILURE OF THE REGULATOR?
5. WHAT IS THE PURPOSE OF THE DETRAIN CHAMBERS? WHERE ARE THEY LOCATED?
6. WHAT CONTROLS THE OIL LEVELS IN THE DETRAIN CHAMBERS?
7. WHERE DOES SEAL OIL DRAIN TO? WHERE FROM HERE?
8. WHAT IS NORMAL VACUUM ON THE SEAL OIL DRAIN TANK?
9. ON FAILURE OF SEAL OIL EVACTOR, WHAT SHOULD BE DONE TO ALLOW VENTING OF THE SEAL OIL DRAIN TANK?
10. HOW IS SEAL OIL SUPPLY FILTERED?

HYDROGEN SYSTEM

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1. HOW IS HYDROGEN CONTAINED WITHIN THE GEN.?
2. WHAT ARE THE ADVANTAGES OF H2 COOLING?
3. WHAT IS THE EXPLOSIVE RANGE OF H2?
4. HOW IS H2 PURITY MAINTAINED? WHAT CAUSES LOWERING OF PURITY?
5. WHY IS IT NECESSARY TO PURGE H2 WITH CO2?
6. HOW IS H2 GAS COOLED WITHIN THE GEN?
7. WHAT IS THE PURPOSE OF THE GEN. LIQUID DETECTOR? HOW IS IT TESTED?
8. WHAT IS THE RELATIONSHIP BETWEEN H2 PURITY AND GEN. FAN DIFFERENTIAL PRESSURE? HOW CAN ONE BE USED TO DOUBLE-CHECK THE OTHER?
9. HOW CAN H2 BE VENTED QUICKLY FROM THE GEN. CASING?
10. WHAT IS NORMAL H2 PRESSURE IN GEN. CASING?

GENERAL 100-200

1. HOW MANY STAGES ON THE GT TURBINE? THE COMPRESSOR?
2. WHAT IS THE ADVANTAGE OF THE AWC'S ON THE COMPRESSOR INLETS?
3. WHY IS IT NECESSARY TO SHELL-BLAST THE COMPRESSOR? EXPLAIN THIS PROCEDURE.
4. WHAT IS THE PURPOSE OF THE TURNING GEAR? WHERE IS IT LOCATED? EXPLAIN PROCEDURE FOR MANUAL OPERATION.
5. ON A NORMAL START-UP, AT WHAT RPM (APPROX.) DOES THE GT FIRE?
6. AT WHAT RPM (APPROX.) DOES THE STARTING MOTOR SHUTDOWN?
7. HOW DO WE PROTECT AGAINST FIRE IN THE HOT-END BEARING TUNNEL?
8. EXPLAIN THE PROCEDURE FOR WATER-WASHING THE GT COMPRESSOR.
9. WHERE ARE THE DP ROTOR GLAND METERS LOCATED?
10. WHAT IS THE PURPOSE OF THE BLEED VALVES ON THE COMPRESSOR?
11. WHAT COMPONENTS ARE INCLUDED IN THE STARTING BLOCK? THE INTERMEDIATE BLOCK? THE THERMAL BLOCK?
12. WHAT IS THE PURPOSE OF STEAM INJECTION? WHERE IS THIS STEAM SUPPLIED FROM?
13. EXPLAIN THE FUEL-AIR EXHAUST GAS CYCLE (INCL. APPROX. TEMPERATURES).
14. WHAT PROBLEM IS INDICATED BY AN ABNORMALLY HIGH LEVEL IN ONE AWC AND ABNORMALLY LOW IN THE OTHER?
15. WHAT IS THE PROCEDURE FOR STARTING THE STAND-BY ARU RETURN PUMP ON THE AWC'S?
16. WHAT IS THE ADVANTAGE OF COOLING THE INLET AIR TO THE GT COMPRESSOR?

TEMPERATURES).

14. WHAT PROBLEM IS INDICATED BY AN ABNORMALLY HIGH LEVEL IN ONE AWC AND ABNORMALLY LOW IN THE OTHER?
15. WHAT IS THE PROCEDURE FOR STARTING THE STAND-BY ARU RETURN PUMP ON THE AWC'S?
16. WHAT IS THE ADVANTAGE OF COOLING THE INLET AIR TO THE GT COMPRESSOR?

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9/11/90
BLOCK #122

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HRU-100/200 WELD IN REGEN HDR

SAFE WORK PROCEDURE

PROCEDURE FOR WELDING IN REGENERATOR HEADER

CASE NO. 1 -

PLEASE NOTE: REGENERATOR ENTRY PERMIT REQUIRED IN ADDITION TO THIS SAFE WORK PROCEDURE.

1. THERE WILL BE TWO (2) SAFETY OBSERVERS
1 STATIONED OUTSIDE MANWAY
1 STATIONED INSIDE NEAR WELD AREA
2. BOTH WELDER AND INSIDE SAFETY OBSERVER WILL WEAR SUPPLIED AIR MASK. WELDER WILL USE SPECIAL TYPE WITH WELDING LENS. (INSURE THAT YOU HAVE ENOUGH AIR BOTTLES FOR DURATION OF JOB)
3. BOTH SAFETY OBSERVERS WILL USE HAND HELD RADIOS FOR COMMUNICATION. THEY WILL TEST RADIOS BETWEEN THE INSIDE MAN AND THE OUTSIDE MAN BEFORE STARTING JOB. THE OUTSIDE MAN WILL MAKE COMMUNICATION TEST WITH CONTROL ROOM. DURING WELDING, INSIDE AND OUTSIDE OBSERVERS WILL HAVE COMMUNICATION AT LEAST EVERY 5 MINUTES.
4. AN AIR MOVER WILL BE PLACED AT MANWAY ENTRANCE (IN REVERSE, SO AS TO PUSH AIR THROUGH INSTEAD OF PULLING). COMMUNICATE TO OUTSIDE MAN THAT IN THE EVENT OF A SPILL, SHUTDOWN AIR MOVER AND EVACUATE MEN FROM INSIDE.
5. WELDERS WILL WELD NO LONGER THAN 15-20 MINUTES AT A TIME. ALSO WHEN WELDERS SWAP, HAVE THE TWO SAFETY OBSERVERS SWAP. HEAT STRESS HAZARD DUE TO PREHEATING OF METAL TO 450 DEGF.
6. NOTIFY SECURITY FOR RESCUE TECHNIQUE.
7. COMMUNICATE PROCEDURE WITH ALL INVOLVED.

CASE II

PLEASE NOTE: REGENERATOR ENTRY PERMIT REQUIRED IN ADDITION TO THIS SAFE WORK PROCEDURE.

1. THERE WILL BE (2) SAFETY OBSERVERS
1 STATIONED OUTSIDE MANWAY - CERTIFIED HOLEWATCH
1 STATIONED INSIDE NEAR WELD AREA
2. BOTH WELDER AND INSIDE SAFETY OBSERVER WILL HAVE A 5 MINUTE ESCAPE AIR PACKS.
3. BOTH SAFETY OBSERVERS WILL HAVE HAND HELD RADIOS FOR COMMUNICATIONS. THEY WILL TEST RADIOS BETWEEN THE INSIDE MAN AND THE OUTSIDE MAN BEFORE STARTING JOB. THE OUTSIDE MAN WILL MAKE COMMUNICATION TEST WITH CONTROL ROOM. DURING WELDING, INSIDE AND OUTSIDE OBSERVERS WILL HAVE COMMUNICATION AT LEAST EVERY 5 MINUTES WITH CONTROL ROOM OPERATOR MONITORING COMMUNICATIONS.

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4. AN AIR MOVER (SMALL ELECTRIC) WILL BE PLACED AT MANWAY ENTRANCE (IN REVERSE, SO AS TO PUSH AIR THROUGH INSTEAD OF PULLING). COMMUNICATE TO OUTSIDE MAN THAT IN TH EVENT OF A SPILL, SHUTDOWN AIR MOVER AND EVACUATE MEN FROM INSIDE.
5. NOTIFY SECURITY FOR RESCUE TECHNIQUE.
- C 6. COMMUNICATE PROCEDURE WITH ALL INVOLVED.

REVISED. JML
07/02/91
BLOCK #127

SAFE WORK PROCEDURE

PROCEDURE FOR WELDING IN REGENERATOR HEADER

CASE NO. 1 -

PLEASE NOTE: REGENERATOR ENTRY PERMIT REQUIRED IN ADDITION TO THIS SAFE WORK PROCEDURE.

1. THERE WILL BE TWO (2) SAFETY OBSERVERS
1 STATIONED OUTSIDE MANWAY
1 STATIONED INSIDE NEAR WELD AREA
2. BOTH WELDER AND INSIDE SAFETY OBSERVER WILL WEAR SUPPLIED AIR MASK. WELDER WILL USE SPECIAL TYPE WITH WELDING LENS. (INSURE THAT YOU HAVE ENOUGH AIR BOTTLES FOR DURATION OF JOB)
3. BOTH SAFETY OBSERVERS WILL USE HAND HELD RADIOS FOR COMMUNICATION. THEY WILL TEST RADIOS BETWEEN THE INSIDE MAN AND THE OUTSIDE MAN BEFORE STARTING JOB. THE OUTSIDE MAN WILL MAKE COMMUNICATION TEST WITH CONTROL ROOM. DURING WELDING, INSIDE AND OUTSIDE OBSERVERS WILL HAVE COMMUNICATION AT LEAST EVERY 5 MINUTES.
4. AN AIR MOVER WILL BE PLACED AT MANWAY ENTRANCE (IN REVERSE, SO AS TO PUSH AIR THROUGH INSTEAD OF PULLING). COMMUNICATE TO OUTSIDE MAN THAT IN THE EVENT OF A SPILL, SHUTDOWN AIR MOVER AND EVACUATE MEN FROM INSIDE.
5. WELDERS WILL WELD NO LONGER THAN 15-20 MINUTES AT A TIME. ALSO WHEN WELDERS SWAP, HAVE THE TWO SAFETY OBSERVERS SWAP. HEAT STRESS HAZARD DUE TO PREHEATING OF METAL TO 450 DEGF.
6. NOTIFY SECURITY FOR RESCUE TECHNIQUE.
7. COMMUNICATE PROCEDURE WITH ALL INVOLVED.

CASE II

PLEASE NOTE: REGENERATOR ENTRY PERMIT REQUIRED IN ADDITION TO THIS SAFE WORK PROCEDURE.

1. THERE WILL BE (2) SAFETY OBSERVERS
1 STATIONED OUTSIDE MANWAY - CERTIFIED HOLEWATCH
1 STATIONED INSIDE NEAR WELD AREA
2. BOTH WELDER AND INSIDE SAFETY OBSERVER WILL HAVE A 5 MINUTE ESCAPE AIR PACKS.
3. BOTH SAFETY OBSERVERS WILL HAVE HAND HELD RADIOS FOR COMMUNICATIONS. THEY WILL TEST RADIOS BETWEEN THE INSIDE MAN AND THE OUTSIDE MAN BEFORE STARTING JOB. THE OUTSIDE MAN WILL MAKE COMMUNICATION TEST WITH CONTROL ROOM. DURING WELDING, INSIDE AND OUTSIDE OBSERVERS WILL HAVE COMMUNICATION AT LEAST EVERY 5 MINUTES WITH CONTROL ROOM OPERATOR MONITORING COMMUNICATIONS.
4. AN AIR MOVER (SMALL ELECTRIC) WILL BE PLACED AT MANWAY ENTRANCE (IN REVERSE, SO AS TO PUSH AIR THROUGH INSTEAD OF PULLING). COMMUNICATE TO OUTSIDE MAN THAT IN TH EVENT OF A SPILL, SHUTDOWN AIR MOVER AND EVACUATE MEN FROM INSIDE

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1. THERE WILL BE 127 SAFETY OBSERVERS

1 STATIONED OUTSIDE MANWAY - CERTIFIED HOLEWATCH
1 STATIONED INSIDE NEAR WELD AREA

2. BOTH WELDER AND INSIDE SAFETY OBSERVER WILL HAVE A 5 MINUTE ESCAPE AIR PACKS.
3. BOTH SAFETY OBSERVERS WILL HAVE HAND HELD RADIOS FOR COMMUNICATIONS. THEY WILL TEST RADIOS BETWEEN THE INSIDE MAN AND THE OUTSIDE MAN BEFORE STARTING JOB. THE OUTSIDE MAN WILL MAKE COMMUNICATION TEST WITH CONTROL ROOM. DURING WELDING, INSIDE AND OUTSIDE OBSERVERS WILL HAVE COMMUNICATION AT LEAST EVERY 5 MINUTES WITH CONTROL ROOM OPERATOR MONITORING COMMUNICATIONS.
4. AN AIR MOVER (SMALL ELECTRIC) WILL BE PLACED AT MANWAY ENTRANCE (IN REVERSE, SO AS TO PUSH AIR THROUGH INSTEAD OF PULLING). COMMUNICATE TO OUTSIDE MAN THAT IN THE EVENT OF A SPILL, SHUTDOWN AIR MOVER AND EVACUATE MEN FROM INSIDE.
5. NOTIFY SECURITY FOR RESCUE TECHNIQUE.
6. COMMUNICATE PROCEDURE WITH ALL INVOLVED.

REVISD: JML
07/02/91
BLOCK #127

DO A 133993
CONFIDENTIAL

TEXT BLOCK # 139

DA-100/200 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 ATTACHMENT TO THIS CHECKLIST, THE STANDARD VESSEL ENTRY PERMIT MUST BE ISSUED WITH AREAS NOTED THAT DO NOT APPLY.

1. UPSTREAM BLOCK VALVE ON DA STEAM PRESSURE CONTROLLER AND BY-PASS VALVE ARE CLOSED AND RED TAGGED. _____
2. STEAM BLOCK VALVE AT DA IS CLOSED AND RED TAGGED. _____
3. DRAIN VALVE IS OPEN DOWNSTREAM OF DA PRESSURE CONTROLLER. RED TAG THIS VALVE. _____
4. DA DOME VENT IS OPEN. _____
5. UPSTREAM BLOCK VALVE ON DA LEVEL CONTROLLER AND BY-PASS VALVE ARE CLOSED AND RED TAGGED. DO NOT BLOCK DOWN STREAM BV. THIS WILL STOP THE LINE FROM BLEEDING PROPERLY. _____
6. SUPPLY AND RETURN BLOCK VALVES ON CONDENSATE TO CBD FLASH TANK ARE CLOSED AND RED-TAGGED. _____
7. DRAIN VALVE IS OPEN DOWNSTREAM OF DA LEVEL CONTROLLER. _____
8. MAIN CONDENSATE BLOCK VALVE IS CLOSED AND RED TAGGED. _____
9. RED TAG CONTROL PUMP DISCHARGE AND SUCTION CLOSED AND BLEED VALVE OPEN. _____
10. DA IS DRAINED. DA DUMP BLOCK VALVE AND BY-PASS VALVE ARE CLOSED AND RED-TAGGED. _____
11. BOTH LP BOILER FEED PUMPS ARE BLOCKED IN WITH SUCTION AND DISCHARGE VALVES RED-TAGGED. _____
12. DRAIN VALVE IS OPEN ON BFP SUCTION HEADER. _____
13. MANWAYS ON STORAGE TANK AND ON DOME ARE OPEN. _____
TEMPERATURE INSIDE THE TANK MUST NOT EXCEED 120 DEGREES F.
14. SAFETY OBSERVER WILL HAVE FIVE (5) MINUTE ESCAPE _____
15. THE SAFETY OBSERVER IS A CERTIFIED HOLE WATCH. _____
16. THE SAFETY OBSERVER HS A HOLE WATCH CARD. _____

EXCEPTIONS TO STANDARD:

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

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

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

OPERATIONS REPR: _____
MAINTENANCE REPR: _____

REVISED: JML
07/03/91
BLOCK #139

TEXT BLOCK # 230

UNIT 100/200 DA FILL AFTER MAINTENANCE

1. CHECK RED TAG MASTER, MAKE SURE ALL ACCEPTED ENTRIES HAVE BEEN RELEASED.
2. IF THE DA STORAGE TANK HAS BEEN OPENED, VISUALLY CHECK STORAGE TANK FOR DEBRIS.
3. REMOVE AIR MOVER FROM DA DOME AND PUT DOME COVER BACK ON USING NEW GASKET. LEAVE VENT VALVE ON DOME CRACKED OPEN. PLACE STORAGE TANK MANHOLE COVER BACK OVER MANHOLE USING NEW GASKET.
4. CLOSE BOTTOM DRAIN VALVE UNDER DA STORAGE TANK. ALSO RECONNECT TUBING TO CONTROL ENTRY BLOCK VALVE. OPEN CONTROL ENTRY BLOCK VALVE AND PULL RED TAG.
5. CLOSE LP BOILER FEED PUMPS HEADER DRAIN VALVE AND PULL THE RED TAG.
6. OPEN LPB PUMPS SUCTION VALVES. CLOSE LOW PRESSURE BF PUMPS DRAIN VALVES.
7. REMOVE RED TAGS FROM CBD FLASH TANK HEAT EXCHANGER CONDENSATE BLOCK VALVES, INLET AND OUTLET. OPEN CONDENSATE INLET TO HEAT EXCHANGER AND CONDENSATE OUTLET BLOCK VALVE.
8. REMOVE RED TAG FROM CONDENSATE HEADER DRAIN VALVE. CLOSE THIS VALVE.
9. REMOVE RED TAGS FROM CONDENSATE HEADER TO DA.
 - (A). LEVEL CONTROLLER BLOCK VALVE (1 TAG)
 - (B). LEVEL CONTROLLER BY-PASS BLOCK VALVE (1 TAG)
11. CHECK WITH CONTROL ROOM OPERATOR TO ENSURE THAT DA LEVEL CONTROL REGULATOR IS CLOSED BEFORE UNBLOCKING CONDENSATE.
12. AT THIS POINT, SEE DA START-UP PROCEDURE.

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07/02/91
BLOCK #230

DO A 133996
CONFIDENTIAL

TEXT BLOCK # 231

TESTING BOILER DRUM LEVEL ALARMS (UNIT 100)
(HIGH PRESSURE, MEDIUM PRESSURE AND LOW PRESSURE)

- A. PLACE FEEDWATER REGULATOR IN MANUAL.
- B. RAISE FEEDWATER FLOW ABOVE DEMAND FOR STEAM PRODUCTION, THIS WILL CAUSE LEVEL IN BOILER DRUM TO RAISE ABOVE NORMAL (0 ON GAUGE). WHEN LEVEL REACH 5+ OR 5 ABOVE (0) ZERO YOU SHOULD GET HIGH LEVEL ALARM.

NOTE: PAY CLOSE ATTENTION TO BOILER STEAM TEMPERATURE DURING THIS OPERATION. IF TEMPERATURE SUDDENLY DROPS, WATER IS BEING CARRIED OVER FF THE DRUM. LEVEL INDICATION IS NOT CORRECT. MAKE NECESSARY FEEDWATER ADJUSTMENTS AND WRITE MMR TO HAVE THIS PROBLEM CORRECTED.

- C. PLACE FEEDWATER REGULATOR BACK TO AUTOMATIC.

THIS PROCEDURE IS FOR TESTING HIGH, MEDIUM AND LOW PRESSURE DRUM.

- A. PLACE FEEDWATER REGULATOR IN MANUAL.
- B. TO CHECK LOW LEVEL ALARMS ON THE HIGH, MEDIUM AND LOW PRESSURE BOILERS (UNIT 100), REDUCE FEEDWATER FLOW BELOW DEMAND FOR STEAM PRODUCTION, BUT ALWAYS MAINTAINING SOME FLOW. THIS WILL CAUSE DRUM LEVEL TO DROP BELOW NORMAL. WHEN LEVEL REACHES (5), THE LOW LEVEL ALARM WILL COME IN.
- C. IF ALARMS DO NOT COME IN, WRITE MMR TO HAVE CORRECTED. BRING DRUM LEVEL BACK TO NORMAL OPERATING LEVEL. TEST COMPLETE.
- D. PLACE FEEDWATER REGULATOR BACK TO AUTOMATIC.

REVISED: JML
07/02/91
BLOCK #231

TEXT BLOCK # 254

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. 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.

DO A 133998
CONFIDENTIAL

TEXT BLOCK # 293

REGENERATOR 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 ATTACHMENT TO THIS CHECKLIST, THE STANDARD VESSEL ENTRY PERMIT MUST BE ISSUED WITH AREAS NOTED THAT DO NOT APPLY.

CONDITIONS: UNIT IS SHUT DOWN.

NOTE: VESSEL ENTRY SECTION OF SAFE WORK MULTI-PERMIT MUST BE COMPLETED AS APPLICABLE.

	YES	NO
1. PIPING COOLED DOWN TO 120 DEGF.	_____	_____
2. BOARD OPERATOR HAS BEEN NOTIFIED OF ENTRY AND APPROPRIATE RED TAGS SIGNED.	_____	_____
3. APPROPRIATE RED TAG MASTERS HAVE BEEN SIGNED.	_____	_____
4. STARTING MOTOR IS RACKED OUT AND RED TAGGED.	_____	_____
5. FUEL GAS SUPPLY LINE IS BLOCKED IN, BLED DOWN, AND RED TAGGED. (DOUBLE BLOCK AND BLEED).	_____	_____
6. STEAM INJECTION LINE IS BLOCKED IN AND RED TAGGED. (DOUBLE BLOCK AND BLEED).	_____	_____
7. LOW VOLTAGE OR GROUND FAULT PROTECTED LIGHTING AVAILABLE.	_____	_____
8. BOARD OPERATOR WILL BE NOTIFIED ON COMPLETION OF WORK AND EXIT.	_____	_____
9. SAFETY OBSERVER WILL HAVE FIVE (5) MINUTE ESCAPE PACKS FOR EACH PERSON INSIDE THE VESSEL AND ONE FOR HIM/HER SELF.	_____	_____
10. THE SAFETY OBSERVER IS A CERTIFIED HOLE WATCH.	_____	_____
11. THE SAFETY OBSERVER HAS A HOLE WATCH CARD.	_____	_____

EXCEPTIONS TO STANDARD:

1. USE OF FIVE (5) MINUTE ESCAPE PACKS RATHER THAN AIR LINE EQUIP. (4A)
2. LIFE LINE, HARNES, ETC. NOT USED. (4B)
3. CANNOT BLIND. CANNOT DOUBLE-BLOCK AND BLEED. (1A)

OPERATIONS REPR: _____
MAINTENANCE REPR: _____

DO A 133999
CONFIDENTIAL

REVISID: JML
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BLOCK #293

DO A 134000
CONFIDENTIAL

TEXT BLOCK # 349

DA 100/200 START-UP

(PURPOSE: THE PURPOSE OF THIS PROCEDURE IS TO INSURE THAT CONDENSATE FLOWING THRU THE HRU HAS BEEN DEAERATED (OXYGEN FREE). IT WILL ALSO BRING HIGH PRESSURE BOILER FEED PUMP TEMPERATURE UP SLOWLY TO PREVENT THERMAL SHOCK TO THE PUMP.

1. OPEN DA STEAM INTERNAL LOOP DRAIN VALVE LOCATED AT GROUND LEVEL ON SOUTH SIDE OF NORTH TRAIN BY LOW PRESSURE MUD DRUM BLOWDOWN VALVE. _____
2. CLOSE DA BOTTOM DRAIN VALVE LOCATED BELOW DA AT DA _____
3. CLOSE DA DUMP CONTROL BY-PASS VALVE. _____
4. OPEN DA DUMP CONTROL BLOCK VALVES. _____
5. OPEN DA DOME VENT. _____
6. BRING LEVEL TO 50% FULL. _____
7. SLOWLY BRING STEAM PRESSURE UP TO 15#. ADMITTING STEAM TOO FAST WILL CAUSE EXCESSIVE WATER HAMMER. _____
8. OPEN 2" CONDENSATE LINE TO HIGH PRESSURE BOILER FEED PUMP GLAND COOLERS AND FLOW TO DA. _____
- (9. OPEN 1" DRAINS ON HIGH PRESSURE BOILER FEED PUMP DISCHARGE LINES AND MAINTAIN FLOW. _____
10. LET DA FILL TO OVERFLOWING WHILE MAINTAINING 15# STEAM PRESSURE. _____
11. CONTINUE OVERFLOWING DA UNTIL BOILER FEED PUMPS ARE PUT IN SERVICE. _____

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07/02/91
BLOCK #349

(
DO A 134001
CONFIDENTIAL

TEXT BLOCK # 356

PREPARATION FOR DA/100/200 VESSEL ENTRY

WHEN NECESSARY TO ENTER THE DEAERATORS FOR INSPECTION AND/OR MAINTENANCE WORK, IT IS IMPERATIVE THAT ALL S&LP REQUIREMENTS BE COMPLETED. VESSEL ENTRY PERMITS AND SUPPLEMENTS SPECIFY EVERY PRECAUTION TO BE TAKEN.

TO PREPARE THE VESSEL FOR ENTRY, PROCEED AS FOLLOWS:

1. DRAIN THE STORAGE TANK BY PUMPING WATER TO THE BOILER SECTIONS, AS MUCH AS POSSIBLE.
2. DRAIN THE REMAINING WATER TO THE SEWER BY OPENING THE 2" DRAIN VALVE BENEATH THE TANK WHICH CONNECTS TO THE DUMP LINE. THE DUMP CONTROL BY-PASS WILL ALSO HAVE TO BE OPENED. AFTER DRAINING, TAG BYPASS AND DRAIN OPEN.
3. DOUBLE BLOCK AND BLEED OR DISCONNECT CONTROL TUBING LINE FROM BULK TANK AND TAG.
4. DOUBLE BLOCK AND BLEED CONDENSATE TO DA AND TAG.
5. IF TIME IS AVAILABLE, ALLOW THE UNIT TO COOL BEFORE PROCEEDING TO OPEN MANWAYS. IF THIS IS NOT POSSIBLE, BE AWARE OF HIGH TEMPERATURE METAL PARTS AND POSSIBILITY OF HOT VAPORS AND TAKE ADDED PRECAUTIONS.
6. DOUBLE BLOCK AND BLEED STEAM TO DA AND TAG.
7. DOUBLE BLOCK AND BLEED LP BOILER FEED PUMPS AND TAG.
8. CLOSE AND RED TAG CONDUCTIVITY TO AND FROM FLASH TANK.
9. REMOVE MANWAY COVER ON THE SOUTH END OF STORAGE TANK.
10. REMOVE MANWAY COVER ON DOME SECTION. THIS WILL REQUIRE THE REMOVAL OF VENT PIPING.
11. INSTALL AIR MOVER ON DOME MANWAY FOR VENTILATION. TIE OFF AND GROUND PROPERLY.
12. HAVE VESSEL INTERIOR CHECKED FOR EXPLOSIVES AND OXYGEN CONTENT.
13. COMPLETE NECESSARY PERMITS.
14. PROVIDE SAFETY OBSERVER.

REVISED: JML
07/02/9
BLOCK #356

DO A 134002
CONFIDENTIAL

TEXT BLOCK # 370

PLACING GAUGE GLASSES IN SERVICE - UNITS 100/200

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

NOTE: WHEN PLACING A GAUGE GLASS IN 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 OPEN THE STEAM VALVE SLIGHTLY TO ALLOW THE STEAM 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 RETIGHTEN THE COVER PLATE CAP SCREWS AFTER THE GAUGE HAS BEEN IN SERVICE FOR 3 TO 4 HOURS.

(CAUTION: DO NOT USE WRENCHES OR OTHER LEVERAGE DEVICES TO OPEN OR 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 THAT THEY SHOULD BE RELAPPED OR REPLACED.

REVISED: JML
07/02/91
BLOCK #370

TEXT BLOCK # 383

PLACING GAUGE GLASSES IN SERVICE - UNITS 100/200

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

NOTE: WHEN PLACING A GAUGE IN 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 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 RETIGHTEN THE COVER PLATE CAP SCREWS AFTER THE GAUGE HAS BEEN IN SERVICE FOR 3 TO 4 HOURS.

CAUTION: DO NOT USE WRENCHES OR OTHER LEVERAGE DEVICES TO OPEN OR 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 THAT THEY SHOULD BE RELAPPED OR REPLACED.

REVISED: NLC
9/12/90
BLOCK #383

TEXT BLOCK # 391

HRU-100/200 SHUTDOWN LIST

OPEN H. P. SUPERHEATER DRAINS (2-3 TURNS)

OPEN M. P. SUPERHEATER DRAIN (1 TURN)

CRACK OPEN H. P. SUPERHEATER VENTS

CRACK OPEN M. P. SUPERHEATER VENT

OPEN L. P. DRUM VENT

OPEN H. P. LEAD LINE VENT

OPEN M. P. LEAD LINE VENT

OPEN L. P. LEAD LINE VENT

CLOSE DEAERATOR STEAM BLOCK VALVE (ON TOP OF UNIT)

OPEN DEAERATOR STEAM LINE VENT

CLOSE H. P. CONTINUOUS BLOWDOWN LINE TO FLASH TANK

BLOCK IN CONDENSATE TO HEAT EXCHANGER

BLOCK IN CONDENSATE TO DEAERATOR

TURN OFF ALL CHEMICAL FEED PUMPS

OPEN THE DEAERATOR LOOP DRAIN

AS L. P. BFP'S ARE SHUT DOWN. CLOSE DISCHARGE BLOCK VALVES.

CLOSE MANUAL FUEL GAS VALVE

REVISED: NLC
9/12/90
BLOCK #391

DO A 134005
CONFIDENTIAL

TEXT BLOCK # 399

PLACING GAUGE GLASSES IN SERVICE - UNITS 100/200

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

NOTE: WHEN PLACING A GAUGE IN 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 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 RETIGHTEN THE COVER PLATE CAP SCREWS AFTER THE GAUGE HAS BEEN IN SERVICE FOR 3 TO 4 HOURS.

CAUTION: DO NOT USE WRENCHES OR OTHER LEVERAGE DEVICES TO OPEN OR 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 THAT THEY SHOULD BE RELAPPED OR REPLACED.

REVISED: NLC
9/12/90
BLOCK #399

HRU-100/200 ISO HP BFP'S

ISOLATING AND PUTTING BACK ON STAND-BY HIGH PRESSURE BOILER FEED PUMPS ON UNITS 100/200.

(C) 0 ISOLATE PUMP AND MOTOR:

1. TURN LOCAL SWITCH TO THE OFF POSITION AND RED TAG IT.
2. RED TAG START SWITCH OF PUMP TO BE ISOLATED IN THE OFF POSITION.
3. CHECK PUMP TO INSURE IT IS NOT RUNNING . OPEN AND RED TAG BREAKER FOR THE PUMP MOTOR IN MCC.
4. BLOCK THE DISCHARGE BLOCK VALVE ON THE PUMP BEING ISOLATED. RED TAG THIS VALVE.
5. BLOCK THE SUCTION VALVE IN ON THE PUMP BEING ISOLATED. RED TAG THIS VALVE.
6. RED TAG AND OPEN DRAIN VALVE ON DISCHARGE SIDE OF PUMP.

TO WARM UP HP BFP'S ON GT-100/200

TO PUT PUMP BACK ON STAND-BY, IT IS NECESSARY TO WARM THE PUMP UP SLOWLY. THIS WILL PREVENT DAMAGE TO THE MECHANICAL SEALS WHICH ARE SENSITIVE TO SUDDEN TEMPERATURE CHANGES:

1. REMOVE RED TAGS.
- (2. OPEN DRAIN WIDE ON DISCHARGE SIDE OF PUMP.
3. CRACK SUCTION VALVE OFF SEAT UNTIL FLOW COMES OUT OF DISCHARGE DRAIN. (MINIMAL FLOW)
4. AFTER 30 MINUTE ARE WHENEVER PUMP IS HOT.
5. SLOWLY CLOSE DISCHARGE DRAIN TO ALLOW PUMP TO PRESSURE UP.
6. OPEN SUCTION VALVE FULLY.
7. OPEN DISCHARGE VALVE.
8. MAKE SURE GLAND COOLING H2O TO GLAND COOLER IS OPEN (SUPPLY AND RETURN).
9. START PUMP OR PLACE ON STAND BY.

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07/03/91
BLOCK #423

UPDATED: JML
02/02/94

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CONFIDENTIAL

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

C

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 ATTEMPTING 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 POSITIONED 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 WRENCH, TORQUE THE NUTS TO 35 FOOT POUNDS FOLLOWING THE TIGHTENING SEQUENCE.
6. GAUGE GLASS MAY NOW BE REINSTALLED ON THE HRU.

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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 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.
5. GAUGE GLASS IS BACK IN SERVICE
6. 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

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1/27/92
BLOCK #459

DO A 134009
CONFIDENTIAL

TEXT BLOCK # 460

LOSS OF 100/200 LOW PRESSURE BOILER FEED PUMP

ON LOSS OF A LOW PRESSURE BOILER FEED PUMP, OUR MAIN CONCERN WILL BE TRYING TO MAINTAIN A PROPER LEVEL IN THE LOW, MEDIUM, AND HIGH PRESSURE DRUMS. LOSS OF LEVEL WILL RESULT IN OVERHEATING AND POSSIBLE TUBE DAMAGE. WE NORMALLY RUN ONE LOW PRESSURE BOILER FEED PUMP. ON LOSS OF THIS PUMP, OUR MAIN CONCERN IS A REDUCTION IN LOW PRESSURE FEED WATER FLOW FROM THE TRIPPED PUMP BACK SPINNING. THIS WILL CAUSE A LOSS OF FEEDWATER FLOW TO THE HIGH PRESSURE BOILER FEED PUMP. THIS PROBLEM CAN BE SERIOUS.

UPON LOSS OF A LOW PRESSURE BOILER FEED PUMP:

1. ALARM WILL GO OFF ON ANNUNCIATOR PANEL, AND THE STANDBY PUMP SHOULD START, NOTIFY THE SHIFT SUPERVISOR AND AUXILIARY OPERATOR IMMEDIATELY.
2. HAVE THE SHIFT SUPERVISOR AND AUXILIARY OPERATOR BLOCK IN THE DISCHARGE OF THE PUMP THAT HAS TRIPPED AND ENSURE THAT THE STANDBY PUMP HAS STARTED AND IS RUNNING PROPERLY. TRY TO ESTABLISH A CONSTANT FLOW TO THE MEDIUM AND HIGH PRESSURE DRUMS.
3. IF THE STAND BY PUMP WILL NOT BRING THE DRUM LEVEL BACK TO A PROPER FIRING LEVEL FAST ENOUGH, HAVE THE AUXILIARY OPERATOR CRACK OPEN THE BY-PASS AROUND THE FEEDWATER REGULATOR TO BRING LEVEL BACK TO NORNAL LEVEL.
4. WHEN THE DRUM LEVEL IS AT A NORMAL LEVEL, HAVE THE AUXILIARY OPERATOR CLOSE THE BY-PASS AND THE O.S. WILL MONITOR THE LEVELS FROM THE CONTROL ROOM.
5. NOTIFY APPROPRIATE MAINTENANCE SUPERVISOR ABOUT THE PUMP/MOTOR PROBLEMS SO HE CAN HAVE IT REPAIRED AS SOON AS POSSIBLE.

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BLOCK #460

DO A 134010
CONFIDENTIAL

TEXT BLOCK # 490

100/200 H. P. BFP SEAL ADJUSTMENT

1. ISOLATE BFP AS PER PROCEDURE ON CRT.
2. RED TAG BFP AS PER RED TAG MASTER.

NOTE: GLAND SEAL H2O DOES NOT HAVE TO BE BLOCKED AND TAGGED TO PERFORM THIS JOB. (PUMP MUST BE DE-PRESSURIZED).

3. AFTER PUMP HAS DEPRESSURED, YOU CAN CONTINUE. TAKE A MEASUREMENT OF THE SPACE BETWEEN THE SEAL RETAINER HOUSING AND THE SEAL LOCKING COLLAR. (IT SHOULD BE APPROXIMATELY 1/8" CLEARANCE.)

NOTE: MAKE SURE LOCKING COLLAR ALLEN SCREWS ARE TIGHT. IF THEY ARE LOOSE, LOCKING COLLAR MAY HAVE SLID INWARDS CAUSING SEAL FACES TO LOSE CONTACT WITH ONE ANOTHER AND ALLOW LEAKAGE. IF SO, SET CLEARANCE AT 1/8", PUSHING COLLAR AWAY FROM PUMP. USE SHIM MATERIAL ON THREE SIDES OF COLLAR WHEN SETTING CLEARANCE TO ASSURE COLLAR FACE IS SQUARE TO SEAL HOUSING. IF ALLEN SCREWS WERE FOUND TO BE TIGHT, LOOSEN LOCK SCREWS ON COLLAR AND MORE COLLAR (.015"). IN ADDITION TO THE 1/8" CLEARANCE THAT YOU ALREADY HAVE. AGAIN USE THE SHIM STOCK MATERIAL ON ALL THREE SIDES OF THE LOCKING COLLAR TO ASSURE A SQUARE ALIGNMENT. (YOU SHOULD AT THIS POINT HAVE (2) SHIMS .025 AND .015. LOCKING COLLAR MUST BE SQUARE (NOT COCKED OR SEALS WILL LEAK). WHEN YOU HAVE COLLAR POSITIONED PROPERLY TIGHTEN ALLEN SCREWS, TO LOCK COLLAR IN PLACE.

4. CLOSE BLEEDS BACK AND CRACK OPEN SUCTION VALVE ON PUMP UNTIL A FLOW IS OBSERVED COMING FROM BLEED VALVE. CLOSE BLEED VALVE AND PRESSURE UP PUMP (SLOWLY). KEEP AN EYE ON SEALS WHILE PRESSURING UP AND CHECK FOR LEAKAGE.
5. AFTER PUMP HAS PRESSURED, ROLL PUMP SHAFT (BY HAND) AND AGAIN CHECK SEALS FOR LEAKAGE. IF THERE IS NO LEAKAGE, UNTAG PUMP AND PUT PUMP BACK IN SERVICE.

NOTE: IF SEALS ARE STILL LEAKING, BUT HAS SLOWED, REPEAT THE ABOVE STEPS MOVING OUT AWAY FROM PUMP ANOTHER 0.15 OF AN INCH. IF AFTER MOVING COLLAR .030" FROM THE ORIGINAL 1/8" SETTING, AND SEALS ARE STILL LEAKING, SEALS ARE PROBABLY WORN TOO BADLY FOR ADJUSTMENT AND SHOULD BE REPLACED.

RED TAG PUMP AND MMR FOR SEAL REPLACEMENT.

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BLOCK #490

DO A 134011
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TEXT BLOCK # 524

ISOLATING 100/200 HP & MP BOILER VESSEL ENTRY CHECKLIST

GAS TURBINE SHUTDOWN AND TAGGED.

1. RACK OUT AND RED TAG STARTING MOTOR. _____
2. DOUBLE BLOCK AND BLEED GAS LINE AND RED TAG. _____
3. DOUBLE BLOCK AND BLEED STEAM INJECTION LINE
AND RED TAG. _____
4. HP, MP AND LP NON-RETURNS, LEADLINES AND WARM-UP
VALVES DOUBLE BLOCK AND BLEED AND RED TAGGED. _____
5. DOUBLE BLOCK AND BLEED FEED H2O TO HP, MP, AND
LP BOILERS. _____
6. RACK OUT AND RED TAG 1A AND 1B HP BFP'S
(ELECTRICALLY). _____
RACK OUT AND RED TAG 1A AND 1B LP BFP'S
(ELECTRICALLY). _____
7. WHEN BOILER QUILTS STEAMING, DRAIN BOILER SECTION. _____
8. DRAIN ECONOMIZER SECTION IF NEEDED. _____
9. DOUBLE BLOCK AND BLEED OR DISCONNECT CHEM. FEED
PUMPS. _____
10. CONDENSATE TO DEAERATOR MUST BE DOUBLE BLOCK AND
BLED WHEN GOING IN LP BOILER (GAS SIDE). _____
11. O2 AND EXPLOSIMETER TEST RUN AND RESULTS ARE O.K. _____
12. OBTAIN PROPER PERMITS TO ENTER VESSEL AND
SUPPLEMENTS. _____

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HRU 100/200 FREEZE PRECAUTION (DOWN)

LEVEL I

IF 100 AND 200 IS DOWN AND THE HRU'S NEED TO BE DRAINED FOR FREEZE PRECAUTIONS, THE FOLLOWING STEPS SHOULD BE TAKEN:

- 1. OPEN HP, MP AND LP BOILER DRAINS - BOTH SIDES WIDE OPEN**
- 2. OPEN ALL ECONOMIZER DRAINS - BOTH TRAINS**
- 3. OPEN DEAERATOR DRAIN AND DRAIN DEAERATOR**
- 4. OPEN HP SUPERHEATER DRAINS AND VENTS - BOTH TRAINS**
- 5. OPEN MP SUPERHEATER DRAIN AND VENT**
- 6. OPEN DRUM VENTS - HP, MP AND LP**
- 7. OPEN DRUM WATER COLUMN DRAINS - HP, MP AND LP**
- 8. OPEN DEAERATOR WATER COLUMN DRAIN**
- 9. OPEN PREHEATER DRAINS - BOTH TRAINS**
- 10. PLACE ALL FEEDWATER REGULATORS ON MANUAL AND OPEN - OPEN ALL BY-PASSES AND OPEN ALL BOILER FEED PUMP DRAINS**
- 11. RACK OUT AND RED TAG ALL BOILER FEED PUMPS ELECTRICALLY**
- 12. OPEN ALL DOWNCOMER DRAINS - BOTH TRAINS**
- 13. OPEN VENTS ON ALL LEAD LINES TO KEEP LEAD LINE HOT UP TO NON-RETURN**
- 14. UNPLUG PD4 AND CONTROL PUMPS - DISCONNECT DISCHARGE PIPING AT PUMP - DRAIN LINE INTO BUCKET AND POUR BACK INTO BULK TANK**
- 15. BLOCK IN PD4 AND CONTROL BULK TANKS - DISCONNECT SUCTION LINE AT PUMP - DRAIN LINE INTO BUCKET AND POUR BACK INTO BULK TANK**
- 16. INSURE SAMPLE COOLERS ARE OPEN - THIS WILL DRAIN CAD LINES - (NOTE: ON 200, DRAINS IN CBD LINES MUST BE OPENED).**
- 17. BLOCK IN STEAM TO DEAERATOR - GROUND LEVEL. BLOCK VALVE UPSTREAM OF CONTROL VALVE AND OPEN DRAINS ON BOTH SIDES OF CONTROL VALVE.**
- 18. CONDENSATE TO UNIT -**
 - A. BLOCK IN AT BLOCK VALVE UPSTREAM OF DEAERATOR LEVEL CONTROL VALVE.**
 - B. OPEN DRAINS ON EACH SIDE OF DEAERATOR LEVEL CONTROL VALVE.**
 - C. OPEN DRAINS ON BOILER FEED PUMP GLAND COOLERS.**
 - D. BLOCK IN CONDENSATE TO FLASH TANK.**
 - E. AFTER EVERYTHING HAS DRAINED, PROCEED AS FOLLOWS.**
 - F. BLOCK IN CONDENSATE TO AND FROM BOILER FEED PUMP GLAND COOLERS.**

NOTE: ON QT-200, IT WILL BE NECESSARY TO THROTTLE CONDENSATE TO BOILER FEED PUMP GLAND COOLERS TO MAINTAIN FLOW ON THIS LINE.
 - G. CLOSE DOWNSTREAM VALVE ON CONDENSATE TO DEAERATOR - (THIS IS THE LAST**

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VALVE ON THIS LINE).

- H. CLOSE DRAINS DOWNSTREAM OF DEAERATOR LEVEL CONTROL VALVE.
- I. RUN WATER HOSE FROM DRAIN UPSTREAM OF DEAERATOR LEVEL CONTROL VALVE TO DITCH.
- J. CRACK OPEN CONDENSATE TO FLASH TANK AND ALLOW SMALL AMOUNT OF FLOW THROUGH FLASH TANK AND BACK OUT OF HOSE TO DITCH.

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TEXT BLOCK # 552

HRU-100/200 LP BOILER VESSEL ENTRY CHECKLIST

GAS TURBINE SHUT DOWN AND TAGGED. DRUM VENTED AND DRAINED.

	YES	NO
1. RACK OUT AND RED TAG STARTING MOTOR.	_____	_____
2. DOUBLE BLOCK AND BLEED GAS LINE.	_____	_____
3. DOUBLE BLOCK AND BLEED STEAM INJECTION LINE.	_____	_____
4. RACK OUT AND RED TAG LPBFP'S.	_____	_____
5. BLOCK SUCTION AND DISCHARGE OF LPBFP AND BLEED.	_____	_____
6. DOUBLE BLOCK AND BLEED STEAM FROM BOILER.	_____	_____
7. WHEN BOILER QUIT STEAMING, DRAIN AND TAG.	_____	_____
8. O2 AND EXPLOSIMETER TEST RUN AND RESULTS O.K.	_____	_____
9. OBTAIN NECESSARY PERMITS AND SUPPLEMENTS.	_____	_____
10. CONDENSATE TO DA MUST BE BLOCKED FOR GAS SIDE ENTRY INTO LP SECTION OF HRU.	_____	_____

NOTE: THIS CHECKLIST IS FOR THE LP BOILER NOT THE GAS SIDE.

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