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BP Notes  
Dated: 1990s

*Recovered from site on Feb 27 2021*

### Procedure for Placing 680kW Generator On Line (#2 BP Sub Station)

1. Start generator; check voltage and frequency for proper settings (480V, 60 HZ). Also check oil pressure, battery volts, engine temperature and fuel level.
2. Check that collector mains are operating off their primary feeder (Wilputte).
3. Check that electric exhauster lube pumps are operating on #1 BP sub station feeder.
4. Notify BP foreman to start steam flushing liquor and circulating liquor pumps.
5. Tag out circulating liquor pump motor starter. (Do not run circulating liquor pump with back-up generator)
6. Trip sub station 1600A main breaker and lock out.
7. Close 3000A generator main breaker. **Warning:** (steps 6 and 7) do not have both breakers closed at the same time.
8. Notify stationary engineer then open and lock out 225A circuit breaker (located in #1 BP sub station) labeled "Booster oil pumps".
9. Remove lock and close 100A switch (located in #2 BP sub station) labeled "Booster oil pump back-up feeder". **Warning:** (steps 8 and 9) do not have both switches closed at the same time.
10. With inlet valve closed re-start flushing liquor pump and put back on line.
11. Inform BP foreman to check all 480V loads for proper operation.
12. Notify ovens foreman and heater that you are about to switch power to generator feed.
13. Wait for Ovens foreman to indicate that pushing has stopped and the quench pump is isolated.
14. Start back-up 250 kW rectifier from BP feeder.
15. Determine that no oven machinery is operating and that the reversing machine is not mid-cycle. (Coordinate with heater)
16. Open main 250 VDC breaker and lock out.
17. Close back up 250 VDC rectifier breaker. **Warning:** (steps 16 and 17) do not have both breakers closed at the same time.
18. Open 480V Wilputte bus feeder breaker to free Kirk interlock key. Use key to un-lock BP feeder breaker and close.
19. Open 480V Wilputte lighting feeder to free Kirk interlock key. Use key to un-lock BP feeder breaker and close.
20. Inform foreman and heater that switching is complete.

### Procedure for Shutting Down 680kW Generator

1. Notify Ovens foreman and heater you are about to switch power sources.
2. Wait for Ovens foreman to indicate that pushing has stopped and the quench pump is isolated.
3. Check to make certain main sub station rectifier is on line.
4. Determine that no oven machinery is operating and that the reversing machine is not mid-cycle. (Coordinate with heater)
5. Open back up 250 VDC rectifier breaker.
6. Un-lock and close main 250VDC breaker. **Warning:** (steps 5 and 6) do not have both breakers closed at the same time.
7. Open 480V BP bus feeder breaker to free Kirk interlock key. Use key to un-lock Wilputte feeder breaker and close.
8. Open 480V BP feeder breaker to free Kirk interlock key. Use key to un-lock Wilputte feeder breaker and close.
9. Switch collector mains back to their primary feeder.
10. Inform Ovens foreman and heater that switching is complete.
11. Notify BP foreman to put on the steam flushing liquor pump. (Circulating liquor already on steam)
12. Notify stationary engineer then open and lock out 100A switch (located in #2 BP sub station) labeled "Booster oil pump back-up feeder".
13. Remove lock and close breaker (located in #1 BP sub station) labeled "Booster lube pumps". **Warning:** (steps 12 and 13) do not have both switches closed at the same time.
14. Open 3000A generator main breaker.
15. Un-lock and close 1600A sub station main breaker. **Warning:** (steps 14 and 15) do not have both breakers closed at the same time.
16. Shut down generator.

### Additional Precautions

Due to the connection of the temporary back up generator the following back feed conditions exist:

- a. When the normal 480V bus supply is on the bottom (load side) of the Generator main breaker is hot.
- b. When the generator is on the bottom (load side) of the 1600A main breaker is hot.
- c. When the normal lube pump power supply is on the bottom (load side) of the 100A Booster lube pump back up supply is hot.
- d. When the Booster back up supply is on the bottom (load side) of the 225A booster lube pump breaker is hot.



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#### Procedure for Placing 900kW Generator On Line (Power House)

Start generator; check voltage and frequency for proper settings (480V, 60 HZ). Also check oil pressure, battery volts, engine temperature and fuel level.

Close main generator breaker.

Check that the Blue Room instrumentation is operating on the feeder labeled "Old Marley Pump Room".

Notify BP foreman to shut down plant air compressor and to put steam mill water pump on line.

Pull the power house 480V, 100A main switch located behind air compressor and lock out.

Remove the lock from the generator 480V, 100A main switch and close. Restart vacuum pump and reset control panel. Warning: (steps 5 and 6) do not have both switches closed at the same time.

Trip 2300V breaker #2 located in main sub station and tag out.

Using hot stick and high voltage gloves pull (3) 2300V blade switches located in lower level of the main sub station labeled "MILL WATER PUMPS".

Remove lock from 2300V load break switch located in power house, charge spring and close switch. Visually ascertain blades are in.

Warning: (steps 7, 8 and 9) do not have both switches closed at the same time.

With discharge valve fully closed start mill water pump and put back on line.

Restart plant air compressor.

#### Procedure for Shutting Down 900 kW Generator

Notify BP foreman to shut down plant air compressor and to put steam mill water pump on line.

Pull generator 480V, 100A main switch and lock out.

Close the power house 480V, 100A main switch located behind air compressor. Restart vacuum pump and reset control panel. Warning: (steps 2 and 3) do not have both switches closed at the same time.

Charge spring, open load break switch and lock out. Visually ascertain blades are out.

Using hot stick and high voltage gloves close (3) blade switches labeled "MILL WATER PUMPS".

Close 2300V breaker #2 in main sub station. Warning: (steps 4, 5 and 6) do not have both switches closed at the same time.

With discharge valve fully closed start mill water pump and put back on line.

Restart plant air compressor.

Open generator main breaker.

Shut down generator.

Additional Precautions

Due to the connection of the temporary back-up generator the following back feed conditions exist:

When the normal 2300 Volt feeder is energized the bottom (load side) of the load break switch is hot.

When the generator is on line the bottom (load side) of the (3) blade switches located in the lower level of main sub station are hot.

When the power house 480V, 100A main switch is closed the bottom (load side) of the generator 480V, 100A main switch is hot.

When the generator 480V, 100A main switch is closed the bottom (load side) of the power house 480V, 100A main switch is hot.

SB 11/29/99

Back-up

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HP-6



**INSTALLING BLANKS ON WALL BLEEDER  
AND ON MAIN BLEEDER VALVE**

**PURPOSE:** TO PURGE OUT THE GAS PIPING ON BLEEDER LINE AND  
INSPECT/REPAIR BLEEDER IGNITER.

**PERSON IN CHARGE:** BY PRODUCTS AREA MANAGER

**PERSONS INVOLVED:** BY-PRODUCTS PERSONNEL  
MECHANICAL TECHNICIANS  
OVENS PERSONNEL  
UTILITIES PERSONNEL  
OUTSIDE CONTRACTOR ( HAGBERG CO<sub>2</sub> SUPPLIER)  
MEANY ELECTRIC

**MATERIALS INVOLVED:** COKE OVEN GAS  
CO<sub>2</sub>

**TOOLS NEEDED:** NON-SPARKING TOOLS  
GAS SCOPE (LEL & O<sub>2</sub>)

**VALVE IDENTIFICATION:**

|   |                                      |
|---|--------------------------------------|
| A | ISOLATION VLV. BEFOR REGULATOR VALVE |
| B | ISOLATION VLV. AFTER REGULATOR VALVE |
| C | WATER SEAL VALVE WALL BLEEDER        |
| D | WATER SEAL VALVE WALL BLEEDER        |
| E | DRAIN VALVE WALL BLEEDER             |
| F | CO <sub>2</sub> PURGE VALVE          |
| G | BLEED VALVE                          |
| H | BLEED VALVE                          |
| J | BLEED VALVE AT BLEEDER STACK         |
| K | ISOLATION VALVE ABOVE BLUE ROOM      |
| L | PURGE VALVE ABOVE BLUE ROOM          |

**INITIAL CONDITIONS:**

|   |        |
|---|--------|
| A | OPEN   |
| B | OPEN   |
| C | OPEN   |
| D | CLOSED |
| E | CLOSED |
| F | CLOSED |
| G | CLOSED |
| H | CLOSED |
| J | CLOSED |
| K | OPEN   |
| L | CLOSED |

PROCEEDURE:

1. AT START OF SHUTDOWN NOTIFY THE UTILITY DEPARTMENT TO TAKE AS MUCH GAS AS POSSIBLE.
2. NOTIFY OVENS OF START OF SHUTDOWN.
3. CLOSE OFF AND WATER SEAL MAIN ISOLATION VALVE ABOVE BLUE ROOM. AT VALVE ( K )
4. CLOSE OFF AND WATER SEAL WALL BLEEDER IN EXHAUSTEROOM VALVES ( B ) AND ( D ).
5. HOOK UP PURGE AT VALVE ( F ).
6. DROP WATER SEAL ON COG BLEEDER STACK.
7. BEGIN PURGE BY INTRODUCING CO<sub>2</sub> INTO WALL BLEEDER LINE INSIDE EXHAUSTEROOM AT VALVE ( F ). VENT CO<sub>2</sub> INTO BLEEDER STACK
8. WHEN LEL IS LESS THAN 5% AT VALVE ( G ) LOWER PURGE AND INSTALL BLANK AT FLANGE ( L ).
9. WHEN BLANK IS INSTALLED DISCONNECT PURGE HOSE AND MOVE TO VALVE ( L ) ABOVE BLUE ROOM AND PURGE OUT LINE TO BLEEDER STACK.
10. WHEN LEL IS LESS THAN 5% AT VALVE ( J ) SHUT OFF PURGE AND INSTALL BLANK AT VALVE ( K )
11. OUTSIDE CONTRACTOR (MEANY ELECTRICAL) WORK CAN NOW BEGIN.

Bleeder Black Line

Bleeder Black Line

J

Blank

L

K

A  
x  
D  
x  
x  
C  
x  
B

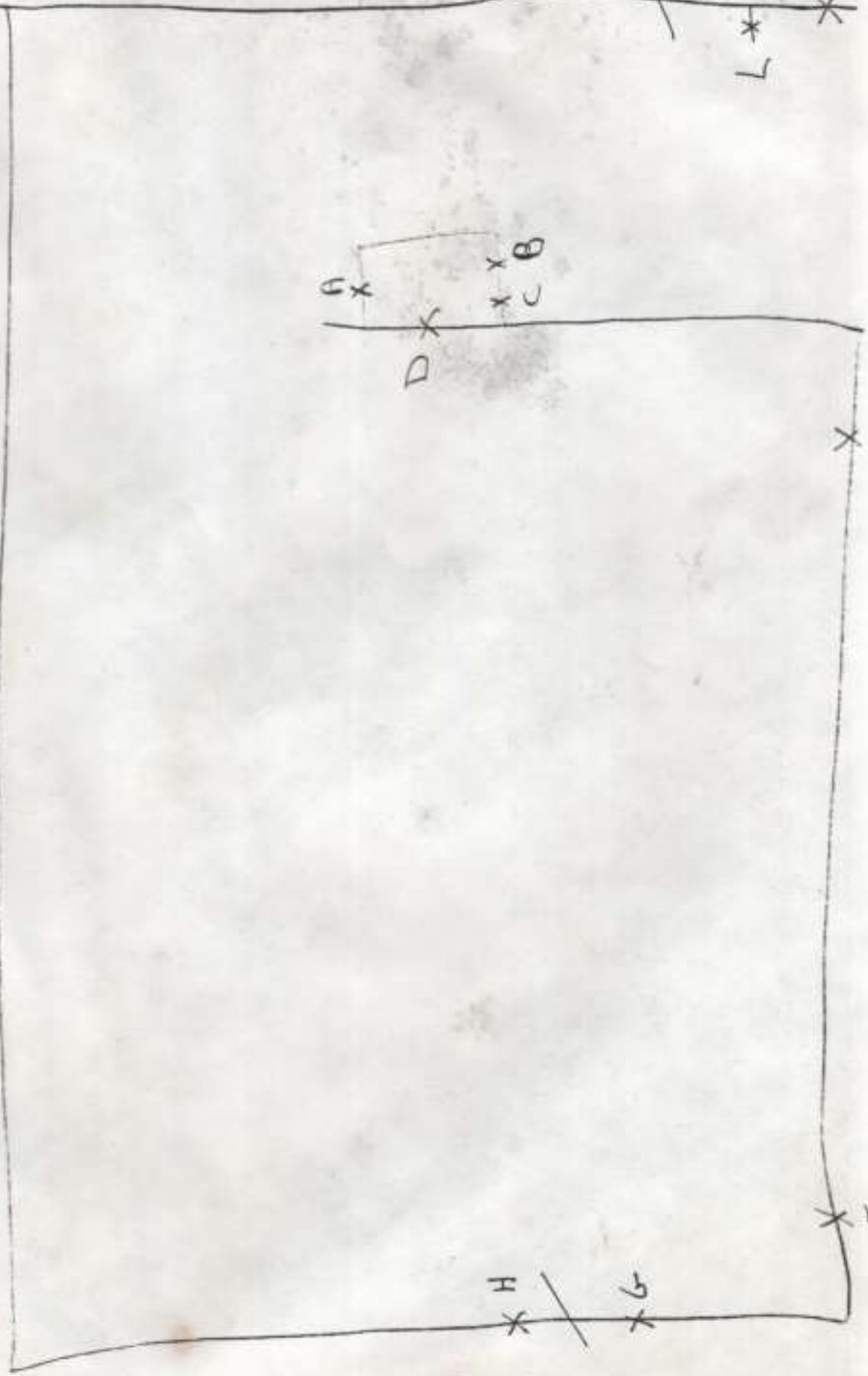
X  
E

X  
H

Blank

X  
G

X  
F





PROCEDURE TO SWITCH BOOSTERS.

1. CHECK TO MAKE SURE ALL OILERS AND COOLING WATER LINES ARE OPEN AND FLOWING ON MACHINE TO BE PUT IN SERVICE.
2. OPEN GAS BYPASS ON MACHINE TO BE PUT IN SERVICE APPROXIMATELY FIVE THREADS.
3. OPEN MAIN #380 STEAM THROTTLE VALVE WIDE OPEN.
4. CLOSE THE TURBINE DRAIN.
5. OPEN HAND CONTROL AND BRING MACHINE SPEED UP TO 2500 RPM'S.
6. SIGNAL OPERATORS TO OPEN GAS INLET VALVE.
7. ONCE GAS INLET VALVE IS OPEN ALL THE WAY CLOSE THE BYPASS VALVE.
8. MAKE SURE THE MACHINE GOING ON LINE IS CONTROLLING THE GAS PRESSURE.
9. ON THE MACHINE COMING OFF LINE CLOSE THE HAND CONTROL VALVE OR THE #380 STEAM THROTTLE VALVE UNTILL THE MACHINE STOPS TURNING.
10. CLOSE THE GAS INLET VALVE ON THE MACHINE BEING TAKEN OFF LINE.
11. ONCE GAS INLET VALVE IS CLOSED ISOLATE THE #380 STEAM BY CLOSING THE THROTTLE VALVE.
12. OPEN THE BYPASS VALVE ON MACHINE COMING OFF LINE FIVE THREADS.
13. OPEN TURBINE DRAIN. THE SWITCH IS NOW COMPLETE.



**Procedure to put the flushing liquor steam turbine on line.**

1. Check the oil lubricators on the turbine to make sure that they are full.
2. Check the cooling water lines on the turbine to make sure they are on and running.
3. Check the grease bulb cartridges on the pump end to make sure they have enough grease.
4. Check/reset emergency trip lever . Make sure latch is engaged
5. Check to make sure all turbine drains are open. Leave drains open until all condensate is out of drain lines.
6. Crack open inlet valve to insure that process fluid is inside pump casing. (Mechanical seal are lubricated by process fluid)
7. Slowly open #380 steam feed to blow out condensate and slowly warm the turbine up. **DO NOT PUT LARGE AMOUNT OF STEAM IN COLD CASING – OPEN STEAM VALVE SLOWLY!**
8. Once nothing but steam is coming out of turbine drains close all drain valves.
9. B.P. operator can now give the signal to assistant operator to open inlet valve on the pump end.
10. As the inlet valve is opening the operator can continue to open steam feed until all the way open.
11. After inlet and steam feed valves are open check pump discharge pressure.
12. If pressure is okay start closing the inlet valve on the electric flushing liquor pump and turn off the power. The switch is now complete.

## SO4 FILTERING UNIT

### START-UP OF HOUSING

- 1) LOOSEN VENT PLUG AND ALLOW AIR TO ESCAPE FROM HOUSING.
- 2) SLOWLY OPEN THE INLET TO GRADUALLY FILL THE HOUSING UNIT.
- 3) WHEN THE HOUSING IS FULL (LIQUID ESCAPES FROM THE TOP VENT) CLOSE THE VENT.
- 4) OPEN THE OUTLET CONNECTION AND FULLY OPEN THE INLET CONNECTION.
- 5) HOUSING UNIT IS NOW OPERATING PROPERLY.

### REMOVAL OF SPENT ELEMENT

- 1) WHEN THE HOUSING REACHES THE PRE-DETERMINED DIFFERENTIAL PRESSURE, STOP THE FLOW TO THE HOUSING AND RELIEVE PRESSURE THROUGH HOUSING DRAIN. REMOVE ENOUGH LIQUID TO SHOW TOP OF BASKET FLANGE. *25lbs.*
- 2) LOOSEN EYE NUTS ON HOUSING AND, USING THE LID LIFT HANDLE, SWING THE LID TO GAIN FULL ACCESS TO THE INSIDE OF THE HOUSING.
- 3) IF USING A LIQUID BAG, PULL THE ELEMENT OUT OF THE BASKET AND DISCARD THE ELEMENT INTO THE RECYCLE BIN.
- 4) REMOVE FILTER BASKETS AND CLEAN THOROUGHLY.
- 5) HOUSING DEBRIS AND SLUDGE SHOULD BE REMOVED TO PROLONG FILTER LIFE.
- 6) REPLACE FILTER BASKETS, MAKE SURE THAT THE STRAINER BASKETS ARE PUSHED FULLY INTO HOUSING GROOVES. IF USING A FILTER BAG, SEAT BAG FULLY INTO STRAINER BASKET TO ASSURE A LEAK PROOF SEAL BETWEEN THE BAG AND BASKET. FOR BEST RESULTS THE BAG SHOULD BE FULLY EXTENDED INTO THE BASKET.
- 7) CLOSE LID AND ALTERNATELY TIGHTEN THE EYE NUTS UNTIL THE LID IS FULLY SEATED ONTO THE O - RING GASKET.
- 8) HOUSING IS NOW READY FOR START-UP. (SEE ABOVE).

### MAINTENANCE

- 1) CLEAN HOUSING DEBRIS AND SLUDGE WHEN CHANGING ELEMENTS (SEE ABOVE).
- 2) PERIODIC CHECKS SHOULD BE MADE ON ALL HOUSING LID AND BASKET O-RINGS TO ENSURE NO CUTS OR DAMAGE HAS INCURRED THAT WOULD CAUSE THE HOUSING NOT TO SEAL PROPERLY. IF HOUSING PARTS BECOME DAMAGED OR WORN REPLACE IMMEDIATELY.



## **PROCEDURE TO PULL SLIPBLANKS #2 GAS BOOSTER**

**PURPOSE :** PURGE OUT #2 GAS BOOSTER AND REMOVE SLIPBLANKS TO PUT IN SERVICE.

**PERSON IN CHARGE:** BP AREA MANAGER

**PERSONS INVOLVED:** BY-PRODUCTS PERSONNEL  
MECHANICAL TECHNICIANS  
OUTSIDE CONTRACTOR ( GRANT HAGBERG )

**MATERIAL INVOLVED:** COKE OVEN GAS  
CO<sub>2</sub>

**TOOL NEEDED:** NON-SPARKING TOOLS  
GAS SCOPE

### **PROCEDURE:**

1. BOOSTER INLET AND DISCHARGE VALVES CLOSED.
2. WATER SEAL INLET AND OUTLET GAS VALVES.
3. NOTIFY BOILERHOUSE TO REDUCE 9lb PRESSURE ALSO NOTIFY OVENS DEPT.
4. OPEN VENT VALVE ON TOP OF BOOSTER AND VENT OUTSIDE OF BUILDING.
5. HOOK UP CO<sub>2</sub> PURGE AT BOOT DRAIN AND START PURGE, 1-2 lb OF PURGE.
6. WHEN GAS LEVEL IS LESS THAN 5% ON GAS SCOPE, CUT PURGE TO TANK PRESSURE.
7. SHOP CAN REMOVE BLANKS FOR INLET AND OUTLET GAS VALVES.
8. JOB IS COMPLETE.

### PROCEDURE USED TO UNPLUG PRIMARY COOLER

- 1.) HAVE B.P ENGINEER OPERATE EXHAUSTER IN MANUAL CONTROL
- 2.) ISOLATE S. PRIMARY GAS INLET TO PRIMARY
- 3.) OPEN LIQUOR INLET ON N. PRIMARY ALL THE WAY OPEN
- 4.) CLOSE BOTTOM SPRAY VALVE ON N. PRIMARY COOLER
- 5.) PLACE PRESSURE GAUGE ON TOP SPRAY OF N. PRIMARY COOLER
- 6.) MONITOR TEMPS AT CHART IN PRIMARY CHART ROOM , WHEN N. PRIMARY TEMP REACH 55 DEGREES CELCIUS CLOSE OFF LIQUOR TO N. PRIMARY COOLER.
- 7.) SHUT DOWN PRECIPS BEFORE CLOSING LIQUOR VALVE ON N. PRIMARY COOLER
- 8.) WHEN N. PRIMARY COOLER TEMP REACHES THE PRIMARY INLET TEMP STOP HEAT-UP AND REPLACE ALL VALVES IN OPERATING POSITION.



## SLIP BLANKING OF AMMONIA ABSORBER

WEDNESDAY JUNE 17, 1998 4:30 am

PERSON IN CHARGE: AREA MANAGER OF BY PRODUCTS

INITIAL CONDITIONS :

ABSORBER INLET OPEN

ABSORBER DISCHARGE OPEN

ABSORBER BY PASS OPEN

VAPOR LINE FROM STILL TO ABSORBER OPEN

1. SHUT DOWN AMMONIA STILL LEAVING TOP VENT OPEN AND STEAM PURGE ON STILL. CLOSE VAPOR LINE VALVE TO ABSORBER AND SLIP BLANK.
2. CLOSE ABSORBER INLET AND OUTLET VALVES AND ESTABLISH WATER SEALS ON BOTH VALVES.
3. OPEN VENT ON TOP OF ABSORBER.
4. INTRODUCE CO<sub>2</sub> INTO BOTTOM OF AMMONIA ABSORBER AT 1-2 LBS.
5. MONITOR TOP VENT FOR COMBUSTIBLES WITH GAS SCOPE.
6. WHEN LEL LEVEL IS BELOW 5% , AND CO<sub>2</sub> LEVEL IS 85% IT IS NOW SAFE TO INSTALL SLIP BLANKS.
7. AT THIS TIME SHUT DOWN ON PURGE.
8. WHEN SLIP BLANKING IS COMPLETE AND BOLTS ARE TIGHT REPAIRS CAN NOW BEGIN.

**REMOVAL OF SLIP BLANKS**  
THURSDAY 6/18/98

1. REMOVE SLIP BLANKS FROM INLET AND OUTLET GAS VALVES ON AMMONIA ABSORBER. REMOVE BLANK ON VAPOR LINE AT AMMONIA STILL.
2. SLIP BLANK SPRAY LINES ON ABSORBER TO SECURE SULFATE AREA FOR WELDING.
3. HOOK UP HOSE FOR DRAINING CONDENSATE FROM ABSORBER INTO TANK AT AMMONIA STILL.
4. START UP AMMONIA STILL.



## NH<sub>3</sub> Still and Amm. Absorber Shutdown

1. Isolate NH<sub>3</sub> Still at 4:00AM 11-9-99 using Shutdown procedure.
2. Shut down sulfate plant. Drain down Lines for valve change at pumps.
3. Absorber shutdown, Open abs. By Pass
4. Close gas inlet and outlet valves at Abs. Water seal both valves.
5. Using steam from Amm. still purge out all gas from Absorber.
6. After gas level is below 5% LEL work can be started on vapor line off Amm still.
7. Drain level of liquid in absorber for valve change.
8. Have Mech tecks install wafer valve and install slip blank.
9. Install slip blank in North NH<sub>3</sub> Still to prevent vapor from coming back into line. (Done.)



## Secondary Cooler - Slip Blank

Open Bypass Valves on #1, #2 LBA's

Close Inlet Valves on #1, 2 LBA

Open Bypass Valve on Secondary Cooler

Close Inlet and Discharge Valves on 2° Cooler

Establish Water Seals on Inlet and Discharge Valves

Open Vent on Top of 2° Cooler

Introduce CO<sub>2</sub> Purge into Vessel

When % Gas at Vent is less than 5%

Reduce Purge Pressure to Tank Pressure

Install Slip Blanks on Inlet and Discharge Valves

When Blank is in Place and Bolts are Tight

Proceed with Outage

## Blanks Needed

GAS Inlet

GAS Discharge

(3) Drip Lines

Liquor Line

STEAM OUT Tube Bundles

Divert Flow from Center Intercept to Decanters  
@L.O.



## SECONDARY COOLER PURGE

**PURPOSE:** SHUT DOWN AND PURGE OUT UNIT TO CHANGE OUT THREE STEAM VALVES.

**PERSON IN CHARGE:** BY-PRODUCTS AREA MANAGER

**PERSONS INVOLVED:** BY-PRODUCTS PERSONNEL  
MECHANICAL TECHNICIANS  
OVENS PERSONNEL  
OUTSIDE CONTRACTOR (HAGBERG)

**MATERIALS INVOLVED:** COKE OVEN GAS  
CO<sub>2</sub>  
LIQUOR & TAR

**TOOLS NEEDED:** NON-SPARKING TOOLS  
GAS DETECTOR (LEL & O<sub>2</sub>)

### VALVE IDENTIFICATION:

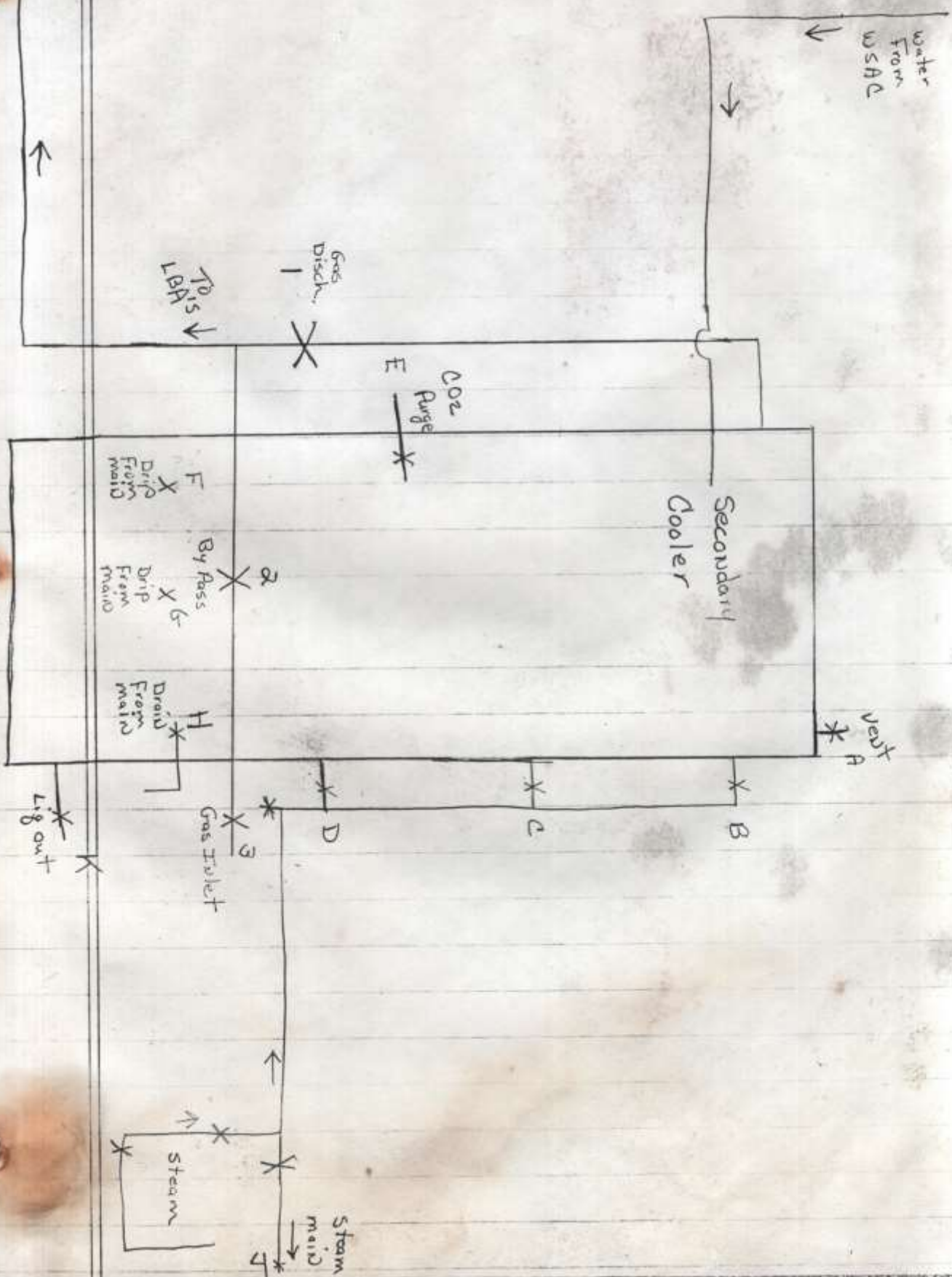
|   |                           |
|---|---------------------------|
| A | VENT LINE                 |
| B | TOP STEAM VALVE           |
| C | MIDDLE STEAM VALVE        |
| D | BOTTOM STEAM VALVE        |
| E | PURGE OUT VALVE           |
| F | CONDENSATE DRIP FROM MAIN |
| G | CONDENSATE DRIP FROM MAIN |
| H | CONDENSATE DRIP FROM MAIN |
| J | MAIN STEAM SHUT OFF       |
| K | LIQUOR DISCHARGE          |
| 1 | GAS DISCHARGE VALVE       |
| 2 | GAS BY PASS VALVE         |
| 3 | GAS INLET VALVE           |

**SCOPE OF WORK:** REPLACE TWO STEAM VALVE ON UPPER AND MIDDLE OF SECONDARY COOLER. INSTALL STEAM SHUT OFF VALVE BEFORE COOLER MAIN ISOLATION.

**PROCEDURE:**

1. NOTIFY OVENS AND UTILITY DEPARTMENTS OF START OF SHUT DOWN.HIGH GAS TEMPERATURE.
2. OPEN BY-PASSES ON #1 AND #2 L.B.A'S.
3. OPEN BY PASS VALVE ON SECONDARY COOLER. (2)
4. CLOSE INLET AND OUTLET GAS VALVES ON SECONDARY COOLER AND WATER SEAL. (1 & 2 )
5. OPEN VENT ON TOP OF COOLER ( A )
6. INTRODUCE WARM CO<sub>2</sub> THROUGH VALVE (E)
7. CHECK % OF GAS LEVEL AT VENT (A) WITH GAS SCOPE
8. WHEN % GAS LEVEL IS LESS THAN 5% AT VENT AND ON STEAM LINE CHECK % OF CO<sub>2</sub> WITH METER IF LEVEL OF CO<sub>2</sub> IS 85% LEVEL SHUT OFF CO<sub>2</sub>.
9. UNIT IS NOW READY FOR REPAIRS.





STEPS TAKEN TO REGAIN TAR FLOW TO THE SECONDARY COOLER (7/21/96)

- 1.) LOST TAR FLOW TO THE SECONDARY COOLER WHILE GOING THROUGH THE REGULATOR. STEAMED OUT TAR LINE FROM THE SOUTH END.
- 2.) STILL NO TAR FLOW. STEAMED OUT TAR LINE FROM THE SECONDARY COOLER END.
- 3.) ONCE AGAIN, NO TAR FLOW. PUMPED TAR FROM THE TAR COLLECTOR TANK TO THE NORTH TAR STORAGE TANK AND BACK. DURING THIS OPERATION, IT WAS NOTICED THAT IT TOOK LONGER THAN USUAL TO PUMP THE TAR BACK AND FORTH.
- 4.) STILL NO TAR FLOW. HAD TAR GO THROUGH THE TAR BY-PASS LINE AT THE SECONDARY COOLER END. TAR WAS NOW GOING INTO THE SECONDARY COOLER, BUT HAD TO TAKE SAMPLES EVERY 15 MINUTES TO GET THE TAR PERCENTAGE INTO THE SECONDARY COOLER.
- 5.) AFTER SOME TIME, IT WAS FOUND THAT NO TAR WAS NOW NOT GOING THROUGH THE BY-PASS LINE AS WELL. STEAMED OUT THE TAR LINE FROM BOTH ENDS AS BEFORE.
- 6.) TOOK A SAMPLE OUT OF THE TAR LINE AT THE SECONDARY COOLER. IT WAS APPROX. 25 PERCENT TAR AND THE REST WAS WATER.
- 7.) REALIZING THAT THE WATER MAJORITY IN TAR LINE WAS PROBABLY THE CONDENSATE FROM THE STEAM-OUTS, HAD THE TAR/WATER CONTINUE TO GO THROUGH THE TAR LINE.
- 8.) AFTER APPROX. 15 MINUTES, WATER WAS STILL IN THE LINE. PUMPED TAR FROM THE TAR COLLECTOR TO THE NORTH TAR STORAGE TANK AND BACK. THIS TIME IT TOOK LONGER TO PUMP THAN THE PREVIOUS TIME.
- 9.) TOOK A SAMPLE FROM THE TAR LINE AT THE SECONDARY COOLER. IT STILL HAD WATER IN IT, BUT NOW IT WAS COMING OUT OF THE TAR LINE VERY WEAKLY.
- 10.) SWITCHED TAR PUMPS. THE FIRST PUMP INDICATED THE SETPOINT PRESSURE, APPROX. 60. THE SECOND PUMP USED INDICATED A PRESSURE OF ONLY 40 AND WAS NOT PUSHING THE TAR THROUGH THE LINE ANY BETTER.
- 11.) NOW HAD BOTH PUMPS ON. THIS HAD INDICATED A PRESSURE NOW OF ONLY 50!, AND LIKE BEFORE, THE TAR WAS NOT GOING THROUGH THE LINE AS IT SHOULD.
- 12.) AS A FINAL ALTERNATIVE, CLOSED THE RECIRCULATION LINE ON THE WEST SIDE OF THE TAR COLLECTOR. THIS IMMEDIATELY RESTORED THE TAR FLOW TO SECONDARY COOLER.
- 13.) SHORTLY AFTERWARD, WAS ABLE TO HAVE TAR GO THROUGH THE REGULATOR WITH NO PROBLEM.



### Steaming L.O. Vents.

1. Notify foreman and ovens heating dept.
2. Put L.O. intercept sump in manual.
3. Reduce steam flow to still.
4. Open isolation valve on top floor of L.O. building to vent to atmosphere.
5. Isolate vent line from gas blanketing system using 3-way valve on second floor from top.
6. Remove PSV pallet and install block.
7. Hook up steam hose to vent line in building and turn on.
8. Open and close valves in building to get lines hot as needed.
9. Steam vent lines approximately 20 to 30 minutes or as needed.
10. Shut steam off and disconnect hose.
11. Open all valves you may have closed while steaming except valves in steps 4 and 5.
12. Put L.O. intercept sump back in auto.
13. Remove block on PSV and install pallet screen and top hat.
14. Put vent line back to gas blanketing system using valve from step 5.
15. Isolate vent valve on top floor as in step 4.
16. Check still pressure to make sure it's normal.
17. Notify foreman and heating dept. when done.
18. Increase steam to still as needed.



## Procedure - Steaming L.O. Vents

- 1) Open isolation valve above 3-WAY valve on L.O. vent line.
- 2) Isolate L.O. vent from the BEC system using the 3-WAY valve, then isolate pressure gauge at 3-WAY valve.
- 3) Remove the pallet on the 2" PSV on the SW corner of the L.O. building and block closed using block and gasket provided on platform outside SW corner of L.O. building.
- 4) Vent L.O. sump and open gauge hatch.
- 5) Pump sump down in manual until the pump goes on suction then put back in auto.
- 6) Lower the steam feed to the L.O. still slightly to help reduce still pressure.
- 7) USE one of the several steam outs provided on the vent line and hook up the 150 lb. steam hose.
- 8) Notify B.P. Foreman and Ovens Heating Dept the procedure is to be started.
- 9) Turn on the 150 lb. steam and monitor progress by touching the line to see if hot.
- 10) By using the many valves available direct the steam flow through the line by closing and opening each valve until all lines are hot and appear open.
- 11) Also monitor steam vapor coming out through the flame arrestor at the top of the L.O. building and do not turn the steam off until a steady volume is noticed.
- 12) Once all lines appear open turn off the 150 lb. steam.
- 13) During steaming it is normal for the still top and bottom pressure to increase from (6.4-8.2) to (10.0-11.4)



so it is important to wait until the still pressure is back in operating range before starting to set the lines back to the BEC system.

- 14) Check the 2" PSV pallet seat and diaphragm clean if needed.
- 15) Replace pallet, screen and Top hat.
- 16) Close L.O. sump gauge hatch AND put back to BEC system using 3-way valve.
- 17) Using 3-way valve put the L.O. vent back to the BEC system
- 18) Isolate the vent valve above 3-way valve on vent line.
- 19) monitor the still top and bottom pressures to make sure its normal.
- 20) INCREASE steam to the still as needed to maintain proper operating temperature
- 21) Notify B.O. foreman AND overns heating dept. job is completed.

Tomy Resnick

ACME STEEL COMPANY  
CHICAGO COKE PLANT  
August 27, 1991

START UP PROCEDURE FOR HEADER #6

1. SET UP CO2 TRUCK OVER LIGHT OIL PROCESS VESSELS WITH HIGH OXYGEN READINGS
2. PURGE SPACE ABOVE VESSEL UNTIL O2 IS LESS THAN 5% O2
3. CLOSE UP VESSEL
4. HOOK UP CO2 TRUCK AT COKE OVEN GAS SOURCE BY #1 LBA
5. OPEN UP PURGE POINTS AT EACH BRANCH LINE AND AT SUCTION MAIN
6. ISOLATE ALL VESSELS FROM 3-WAY VALVES
7. ISOLATE PRESSURE TRANSMITTERS (2) AND GAGES (8-10)
8. ISOLATE PRESSURE DROP TRANSMITTER AT VENTURI FLOWMETER
9. START CO2 PURGE AT #1 LBA AT 1 INCH Hg MONITOR AT MANOMETER AT COLD DECANTER
10. MONITOR PURGE POINTS (@ SUCTION MAIN STEAM OUT)
11. WHEN PURGE POINT AT SUCTION MAIN IS LESS THAN 5% O2 PURGE IS COMPLETE
12. SHUTDOWN CO2 TRUCK
13. INTRODUCE COKE OVEN GAS BY OPENING VALVE V-280 AT #1 LBA
14. OPEN 6" VALVE V-280 AT SUCTION MAIN WHEN LEL READING IS 100% AT SAMPLE VALVE
15. PUT STEAM IN AUTOMATIC AND PUT INSTRUMENTATION BACK IN SERVICE
16. PUT EACH BRANCH LINE ON LINE GAS BLANKETING HEADER



## Purge Low Pressure STEAM line

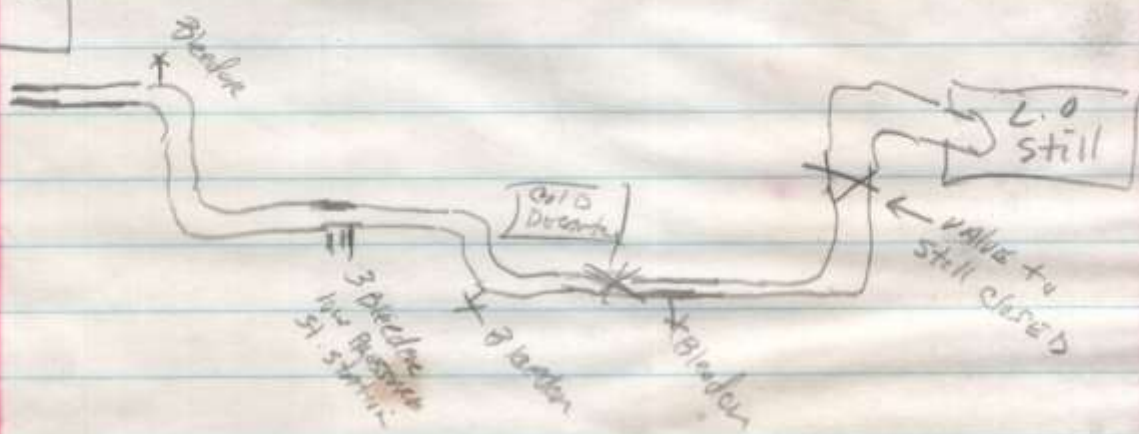
- 1) Open all low pressure line bleeders from the power house, L.O. building AND EXH. ROOM basement.
- 2) Using the isolation VALVE AT the SW corner of the power house slowly open the valve using the exhaust from the steam H<sub>2</sub>O pump.
- 3) Close the steam vent line at the NW corner of the power house once the isolation valve has been opened several threads.
- 4) Watch bleeders for condensate discharge, then steam VAPOR AND let bleed for 30 min. OR MORE.
- 5) Monitor Low pressure steam recorder in EXH. ROOM AS pressure slowly builds up.
- 6) When all bleeders are discharging steam AND the lines are hot slowly open low pressure reducing station to the system.
- 7) When low pressure steam station reaches set point open the steam exh. low pressure line.
- 8) When the Low pressure reducing station is controlling Turc 15min. OR MORE start up L.O. plant.



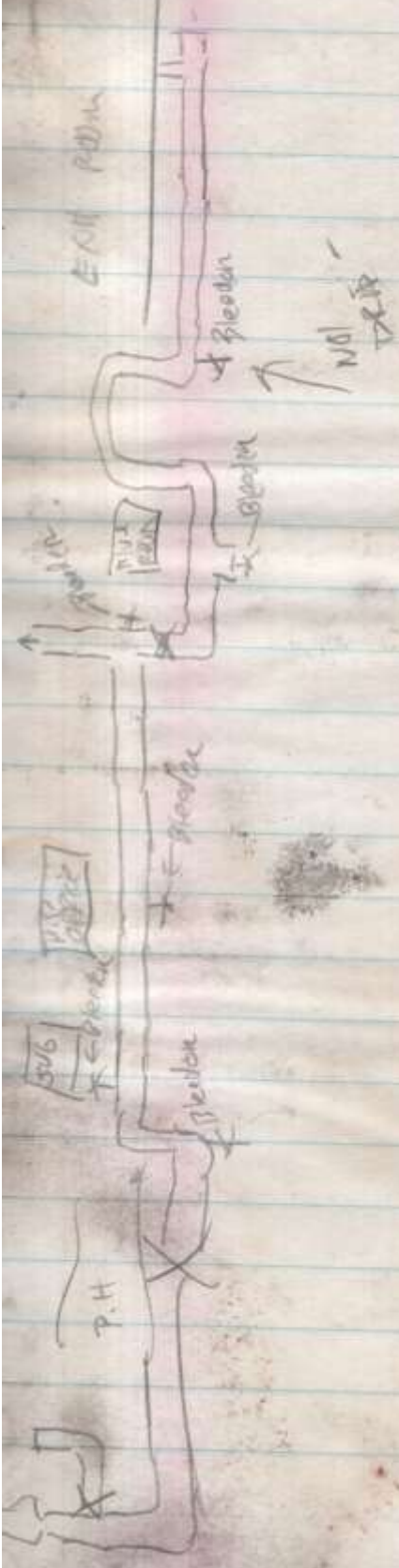




old F.C.I.  
Pump form



5



2



## REPLACE TAR PPT INLET VALVES

ELECTRIC EXHAUSTER ON LINE

SHUT DOWN AMMONIA STILL

SHUT DOWN ABSORBER

OPEN MARTELLO VALVE / CLOSE O'HEARN VALVE / <sup>CLOSE</sup> STERNER <sub>CHAIN</sub> VALVE

CLOSE WATER SEAL ABSORBER DISCHARGE VALVE

WHEN GAS FLOW IS ESTABLISHED THROUGH MARTELLO LINE CONTINUE

WATER SEAL ABS BYPASS AND PPT BYPASS VALVE

OPEN VENT VALVES ON ABSORBER AND NORTH SIDE OF PPT BYPASS LINE AND TAR PPTS

INTRODUCE CO<sub>2</sub> AT #2 TAR PPT

MONITOR PURGE POINTS / MONITOR PURGE PRESSURE < 1"b.

WHEN % GAS IS < 5% AT #2 TAR PPT CLOSE

VENT - SWITCH PURGE FEED TO #3

WHEN % GAS < 5% AT ABSORBER AND TAR PPT BYPASS

SHUT OFF PURGE

INSTALL BLANKS AT ABS BYPASS (WEST SIDE)

AND TAR PPT BYPASS (NORTH OR VALVE ON SPOOL PIECE)

AND ABSORBER DISCHARGE VALVE

WHEN BLANKS ARE IN PLACE AND BOLTS ARE TIGHT

PURGE IS COMPLETE - CONTRACTORS BEGIN WORK

SHUT OFF WATER SEAL



# TAR PPT Inlet Values

When valves are installed

Introduce  $CO_2$  at TAR PPTS MONITOR Pressure

Check valve flanges for leaks

MONITOR  $O_2 < 5\%$

Water seals on Abs bypass, Abs discharge, TAR PPT bypass

Remove blanks

When bolts are tight <sup>vents open</sup> recharge with  $CO_2$

MONITOR  $O_2$  check for leaks

Drop water seals

OPEN Absorber discharge

OPEN TAR PPT BYPASS / <sup>(west)</sup> close Martello valve

MONITOR TAR PPTS / Absorber for 70 gas 795%

RESTART TAR PPTS when 90 gas at abs 795%

RESTART Absorber System

" Mmm stills.



## EFFICIENCY TEST ON TAR PRECIPITATORS

Function of a Tar Precipitator: As the coke oven gas passes through the tar precipitators, light tar and small particles are removed from the gas by electrostatic precipitation. A high potential ionizes the gas and charges the suspended particles. The tar is attracted to and adheres to the tubes where it collects and runs down. The tar, liquor and solid particles are drained to the hot tar well.

Objective: The tar precipitators should remove a minimum of 95% of the remaining tar fog present in the gas. (about 5% of the initial tar loading). The test can determine if this is occurring.

Responsible for Control: By-Product Operator

Process Standard: Accurate time measurement. No obstruction of gas through camera (filter). Make sure precipitator is on line.

Reason for Control: Poor tar removal from the gas results in problems further downstream at the By-Products and at the gas underfiring at the batteries.

Specifications: Ideally 98% efficiency.

Routine Reporting of Data: Report results to Operating Supervision.

Measurement: The tar fog contained in the inlet gas is passes through a filter paper for a given time; this is repeated using different times.(1 to 5 sec.) The outlet gas is tested in a similar manner for 100 seconds. A comparison of stains are made and the time is recorded of the stain that matches the outlet test. eg. if a 100 sec. outlet stain matches a 2 sec. inlet stain, then for every 100 grains of tar present at the inlet of the precipitator there will be 2 grains at the outlet.

Therefore efficiency of precipitator =  $100 - 2 = 98\%$ .

# JOB BREAKDOWN

JOB: #1 & #2 Tar Precipitator Efficiency Test

DEPARTMENT: By-Products

OPERATION: Efficiency Test On Tar Precipitators

SUPERVISOR: R. G. Elder

| PRINCIPAL STEPS IN THE OPERATION (DO'S)  | KEY POINTS (KNOW'S)  | SAFETY INSTRUCTION  |
|--|--|---|
| Connect camera to the test location.<br>Secure moderately tight.   | Cold weather may require the camera to be heated. This avoids water condensing on the filter paper.                            | Using live steam to heat camera requires gloves and care.   |
| At the same time, note the time on the stop watch (or wrist watch). Allow gas to flow for time desired then shut off Dyna-Quip valve on camera.                      | Dyna-Quip ball valve on camera remains closed until ready to time the gas flow also while inserting or removing filter papers. |   |
| Leave the main valve on. Remove filter paper after each test. Remove the filter paper by turning the wing nuts a couple of turns each and remove the cap completely. |  | If steam required to heat camera, caution should be taken.  |
|  |  |   |
|  |  | Always shut main gas inlet valve to camera off prior to dismantling camera, thus avoiding gas inhalation. |

BREAKDOWN MADE BY: Charles Cimino

DISTRIBUTION: By Product Foreman, R. G. Elder

INITIAL ISSUE:

REVISION DATES:

APPROVED DATE:

SUPERINTENDENT:

APPROVED DATE:

HEALTH & SAFETY REP:



## SHUT DOWN OF TAR PRECIPITATOR

- 1.) SHUT POWER OFF ON UNIT.
- 2.) HAVE ELECTRICAL DEPT. PUT GROUND ON UNIT.
- 3.) CLOSE THE GAS INLET VALVE.
- 4.) CLOSE THE GAS OUTLET VALVE.
- 5.)
  - a.) OPEN VENT ON TOP OF UNIT.
  - b.) THEN OPEN BOTH EAR VENTS.
- 6.) PUT STEAM INTO UNIT AT THE BOTTOM MAN HOLE DOOR.
- 7.) SHUT THE UNIT OFF FROM THE HEADER #5 SYSTEM.
- 8.) AFTER APPROXIMATELY TWO HOURS, CHECK UNIT FOR LEL%.  
IF UNIT HAS A LEL% OF LESS THAN 5%, HAVE SHOP INSTALL  
SLIP-BLANKS ON THE UNIT.
- 9.) OPEN DOORS AND MAN WAYS.
- 10.) CLEAN OUT THE BASE OF UNIT.
- 11.) REPAIRS CAN NOW BE MADE AT THIS TIME.

## START UP PROCEDURE TAR PRECIPITATOR

1. PURGE UNIT WITH CO<sub>2</sub> TO REMOVE SLIP BLANKS.
2. OPEN DISCHARGE VALVE TO ENERGIZE WITH GAS, ENOUGH TO GET POSITIVE PRESSURE.
3. CHECK EARS AND TOP OF UNIT WITH GAS SCOPE 80-90% ASSURE PROPER MIXTURE OF GAS.
4. IF YOU HAVE GOOD GAS % FROM GAS SCOPE CLOSE OFF ON VENTS AT TOP OF UNIT TO FORCE GAS THRU BOTTOM VENT.
5. CHECK AND TAKE SAMPLE WITH GAS SCOPE FROM BOTTOM OF UNIT, IF OK CONTINUE.
6. OPEN UP ON DISCHARGE AND INLET GAS VALVES, CHECK FOR GAS LEAKS ON UNIT.
7. AFTER GAS VALVES ARE OPEN LET GAS CONTINUE TO FLOW THRU UNIT FOR APPROX. 1-2 HOURS OR UNTIL EAR TEMPS. HAVE REACHED PROPER RUNNING TEMP.
8. CHECK TO MAKE SURE ALL EAR DRAINS, HEADER SYSTEM VALVES HAVE BEEN OPEN.
9. CALL FOR ELECTRICAL TECH. TO REMOVE GROUND AND START UP POWER.
10. JOB IS COMPLETE.



## EXHAUSTER ROOM SHUTDOWN

4-5-01

PERSON IN CHARGE: BY-PRODUCTS AREA MANAGER

### PERSONS INVOLVED WITH SHUTDOWN:

BY-PRODUCTS PERSONNEL  
MECHANICAL TECHNICIANS  
INSTRUMENT TECHNICIANS  
HEATING DEPARTMENT  
OVENS PERSONNEL  
UTILITY DEPARTMENT  
OUTSIDE CONTRACTORS:  
HAGBERG (CO<sub>2</sub> SUPPLIER)  
BORG MECHANICAL

### SCOPE OF WORK:

1. REMOVE AND REPLACE 30" GAS VALVE (AMMONIA ABSORBER BY-PASS)
2. REMOVE 30" VALVE AND ELBOW PIECE SOUTH SIDE OF #3 GAS BOOSTER.
3. REMOVE OR REPLACE 30" GAS VALVE BONNET NORTH SIDE OF #1 BOOSTER (CHAIN VALVE)

### HAZARDS INVOLVED:

COKE OVEN GAS  
CO<sub>2</sub>

### SAFETY PRECAUTIONS:

GAS SCOPE  
CO<sub>2</sub> PURGE  
STEAM HOSES  
FIRE EXTINGUISHERS  
GAS BAG



## PROCEDURE:

1. SHUT DOWN SULFATE PLANT
2. CLOSE OFF ABSORBER TAIL PIPE
3. SHUT DOWN AMMONIA STILL USING PROCEDURE
4. CLOSE OFF VAPOR LINE TO ABSORBER
5. ADJUST WEIRS ON TAR DECANTERS UP AND TAKE HEADERS 1 TO 7 OFF GAS BLANKETING SYSTEM
6. NOTIFY UTILITY DEPARTMENT TO SET UP TO BACK FEED THE OVENS WITH GAS
7. TURN OFF POWER TO TAR PRECIPITATORS
8. NOTIFY OVENS DEPARTMENT OF EMINENT SHUTDOWN OF GAS BOOSTERS
9. LOWER COKE GAS BLEEDER TO 70cm BLEED POINT
10. NOTIFY OVENS CONTROL ROOM OF POSSIBLE HIGH FUEL GAS PRESSURE (70 cm)
11. SHUT DOWN BOOSTER AND OPEN BY-PASS VALVE
12. MANUALLY SHUT BUTTERFLY AND HAVE INSTRUMENT DEPARTMENT REVERSE IMPULSE LINE ON FUEL GAS PRESSURE BUTTERFLY TO MAINTAIN PRESSURE TO OVENS CONTROL ROOM FROM BOILERHOUSE
13. NOTIFY OVENS OF EMINENT SHUT DOWN OF GAS FLOW FROM THE BATTERY (PUT BATTERY ON PRESSURE)
14. SHUT OFF THE WATER TO THE PLATE AND FRAME HEAT EXCHANGERS
15. SHUT OFF PUMPS AT LIGHT OIL PLANT
16. SHUT DOWN STEAM EXHAUSTER AND OPEN BY-PASS
17. CLOSE OFF VALVE "B" SECONDARY COOLER INLET VALVE AND ESTABLISH A WATER SEAL ON SAME
18. ESTABLISH A WATER SEAL ON VALVE "A" SECONDARY COOLER BY-PASS
19. CLOSE VALVE "I" (STEAM EXHAUSTER DISCHARGE VALVE) AND WATER SEAL
20. SHUT DOWN AND WATER SEAL VALVE "H" (ELECTRIC EXHAUSTER DISCHARGE VALVE)
21. OPEN VALVES ON TAR PRECIPITATORS AND AMMONIA ABSORBER PURGE POINTS
22. INTRODUCE CO<sub>2</sub> AT VALVES C, D, AND E AT NO MORE THAN 4# PRESSURE MONITOR PRESSURE AT ABSORBER AND EXHAUSTER ROOM WITH PRESSURE GUAGES
23. AFTER PURGE IS GOOD AT ABSORBER OPEN VALVE "G" MARTEL LO VALVE AND THE ABSORBER BY-PASS
24. OPEN VALVES J AND K AS EXTRA PURGE POINTS
25. MONITOR PURGE POINTS FOR GAS PERCENTAGE FROM PURGE POINTS



53. HAVE INSTRUMENT DEPARTMENT REVERSE IMPULSE LINE ON FUEL GAS PRESSURE BUTTERFLY TO MAINTAIN 60cm PRESSURE TO OVEN CONTROL ROOM FROM THE EXHAUSTER
54. HAVE INSTRUMENT DEPARTMENT RESET GAS BLEEDER TO 100cm. INSURE THAT GAS IS NOT BEING BLED THROUGH THE FUEL GAS BLEEDER.
55. WHEN OVENS DEPARTMENT IS GETTING ADEQUATE GAS FLOW (ADEQUATE FUEL GAS PRESSURE AND BOTH BATTERY'S ARE ON LINE) NOTIFY UTILITY DEPARTMENT THAT COKE GAS BOOSTER WILL BE STARTED UP
56. START UP BOOSTER AND MAINTAIN (10cm) INLET PRESSURE
57. AFTER GAS FLOW IS ESTABLISHED OPEN WATER AT PLATE AND FRAMES
58. RESTART SULFATE PLANT AND AMMONIA STILL
59. PUT GAS HEADERS ON LINE – RESET DECANTER WEIRS
60. AFTER COKE OVEN GAS TEMPERATURE HAS REMAINED BELOW 45 DEGREES AND TEMPERATURE ON THE PRECIPITATORS EARS ARE NORMAL RESTART PRECIPITATORS. RESTART THE LIGHT OIL PLANT. JOB IS COMPLETE.