

Acme Coke  
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By-Product Plant Purge Instructions  
Dated: varies

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OLD FINAL COOLER COKE OVEN GAS MAIN PURGE

**PURPOSE:** To purge the gas piping from Secondary cooler to the Ovens basement to replace a section of piping at the old Final Cooler connections.

**PERSON IN CHARGE:** By-products Area Manager

**PERSONNEL INVOLVED:** By-products personnel  
Heating department personnel  
Ovens department personnel  
Utility department personnel  
Coke Plant Maintenance (CPM)  
Mechanical Technicians  
Borg Mechanical Contractors (BMC)  
USICO - Nitrogen supplier

**MATERIALS INVOLVED:** Coke Oven Gas (COG)  
Nitrogen gas (N<sub>2</sub>)  
Coke Oven Gas Deposits

**TOOLS NEEDED:** Non-sparking Tools  
Gas Detector (LEL & O<sub>2</sub>)  
Gas Bag and Lighter  
Sawsall  
Hydraulic Nutbuster

**BLANKS:** Secondary Cooler Inlet and By-pass gas valves

The flange above the drip just west of the Coke Plant Pressure Butterfly Control Valve

Wall Bleeder line at south isolation valve for the automatic bleeder and below the by-pass valve.

The COG feed to #6 VOC header.

The four connection for the enrichment gas to the collector mains.



PROCEDURE:

1. Open LBA bypass gas valves two (2) hours before main shutdown to lean out wash oil.
2. Shut down wash oil circulation and isolate feed and suction valves at wash oil pumps. Close LBA by-pass gas valves.
3. Notify ovens control room of start of shutdown - no fuel gas pressure due to stopping COG flow from battery.
4. Notify utility foreman of start of shutdown - allow 1/2 hour delay for shutting all gas off of the boilers and activation of natural gas make-up station.
5. Put battery in neutral and isolate all emergency cock valves.
6. Raise bleeder butterfly valve (A) to approximately 120 cm. H<sub>2</sub>O.
7. Once all of the coke oven gas is off the boilers and the mixing station is on line shut down the boosters.
8. Shut off the power to the tar precipitators and trip all VOC headers to vent to atmosphere.
9. Shut down electric exhauster and bleed batteries, close Secondary cooler inlet valve and water seal both it and the by-pass valve.
10. Open booster by-pass valve wide open on the booster that was on line.
11. Close all booster inlet gas valves and water seal same.



12. Water seal the wall bleeder valve
13. Open valve #3 to introduce nitrogen into cog suction main at 120cm H<sub>2</sub>O pressure (4" Hg).
14. Open bleeder valve #1 & #2 at the secondary cooler.
15. Open bleeders on underfiring gas mains V<sub>1</sub> & V<sub>2</sub>.
16. Open bleeder valve #5 at #2 drip, booster inlet.
17. Monitor pressure of nitrogen purge with a mercury manometer from fuel gas pressure tap at blue room (valve #6).
18. Monitor purge regularly at valve #1, #2, #5, V<sub>1</sub> & V<sub>2</sub>.
19. When L.E.L. is below 5% and gas will not support combustion at valves #1, #2, #5, V<sub>1</sub> & V<sub>2</sub>, blanks may be installed.
20. Install the blank at the flange above the drip, just west of the Coke Plant Pressure Butterfly Control Valve, first and the blanks at the Secondary cooler next.
21. Change valve #7 at Coke Plant Pressure Butterfly Control Valve, as it is frozen closed.
22. Now install the blank at the COG feed to header #6.
23. The blanks at the wall bleeder automatic valve and by-pass should be installed last.
24. Repurge all of the air from the gas main by continuing purge for 10 minutes through the plant bleeder.



25. Maintain tank pressure of nitrogen purge until first piece is ready to be removed.
26. See scope of work.
27. When all new piping is in place and bolts are tight and blind flanges are bolted up tight the purge of  $O_2$  with  $N_2$  will begin.
28. Introduce  $N_2$  at valve #3 - open valves #1, #2, #7 & #8.
29. Slowly raise pressure to 2 lbs. Check all new connections for leaks.
30. Continue purge until all of the purge points, #1, #2, #7 & #8 test less than 2%  $O_2$  and less than 5% L.E.L.
31. Close all purge valves #1, #2, #7 & #8.
32. Repurge the section of piping from the flange above the drip, just west of the Coke Plant Pressure Butterfly Control Valve, supply  $N_2$  at valve #4, purging thru valve #5.
33. Continue purge until purge point #5 tests less than 2%  $O_2$  and less than 5% L.E.L..
34. The blanks at the wall bleeder automatic valve and by-pass should be removed first and the blanks at the Secondary cooler next.
35. Now remove the blank on the COG feed to header #6
36. Remove the blank at the flange above the drip, just west of the Coke Plant Pressure Butterfly Control Valve last.



37. Repurge all of the air from the gas main by continuing purge for 10 minutes through the plant bleeder and valve #1, #2, #5 & #8.
38. Introduce coke oven gas to the main from the furnace plant by operating the plant pressure butterfly valve manually after opening #2 booster inlet valve and dropping water seal.
39. Open by-pass on #2 booster, closing any other by-pass valves that may be open on other boosters.
40. Drop water seals on all other valves that were isolated.
41. Purge the nitrogen from the gas main lines with coke oven gas from the furnace plant thru valves #1, #2, #5, #8, V<sub>1</sub> & V<sub>2</sub>.
42. When any of the purge points shows 100% L.E.L. and will support combustion close that valve, continuing until all points are "sweet".
43. Now open the secondary cooler discharge valve and return plant pressure butterfly to normal operation.
44. Notify ovens that the exhauster is about to be started.
45. Once suction has been established, notify the heating department that they can do whatt they want.
46. Start up boosters and run as necessary to control fuel gas pressure.
47. Lower plant pressure bleeder back to 70cm water.



48. Notify ovens control room and Utility department of completed job.



ACME STEEL COMPANY  
CHICAGO COKE PLANT

PAGE 1

NORTH DECANTER SHUTDOWN

01-17-91

SCOPE OF WORK:

1. SLIP BLANK LIQUOR OVERFLOW LINE TO FLUSHING LIQUOR TANK.
2. REMOVE 2 INCH NIPPLE AND WELD PLUG IN FLUSHING LIQUOR STEAM PUMP DISCHARGE LINE.

STARTING CONDITIONS:

1. NAPHTHALENE LINE TO NORTH DECANTER ON LINE.
2. NORTH DECANTER LEVEL LOW.
3. OVENS MILL WATER SYSTEM HOOKED UP.
4. SOUTH DECANTER ON LINE.
5. FLUSHING LIQUOR SYSTEM ON LINE.

PROCEDURE:

1. NOTIFY OVENS OF START OF SHUTDOWN.  
OVENS ENERGIZE MILL WATER SYSTEM BUT DO NOT OPEN VALVES.
2. NOTIFY OVENS THAT FLUSHING LIQUOR PUMP WILL BE SHUT DOWN.  
OVENS STOP CHARGING.
3. CUT DOWN STEAM FLOW TO NAPHTHALENE LINE.
4. SHOP TO HAVE DESIGNATED BOLTS LOOSE, WEDGES IN PLACE, BLANK AND GASKET READY.
5. SHUT DOWN FLUSHING LIQUOR PUMP.
6. CLOSE INLET VALVE TO KINNEY STRAINER.  
OVENS TO PUT MILL WATER ON AFTER FLUSHING LIQUOR PUMP SHUTDOWN.
7. OPEN AN INLET VALVE TO THE NORTH DECANTER WHILE CLOSING AN INLET VALVE TO THE SOUTH DECANTER -- REPEAT--.



PROCEDURE (CONTINUED):

8. PUMP LEVEL IN SOUTH DECANTER DOWN UNTIL FLUSHING LIQUOR OVERFLOW STOPS.
9. STOP TO PROCEED WITH INSTALLING BLANK ON NORTH DECANTER OVERFLOW AND REMOVE PIPING ON 2 INCH NIPPLE, DRAIN LINE AND WELD PLUG IN FLUSHING LIQUOR PUMP DISCHARGE LINE.
10. OPEN INLET VALVES TO SOUTH DECANTER AS NORTH DECANTER FILLS. CLOSE NORTH DECANTER INLET.
11. WHEN PLUG IS WELDED ON FLUSHING LIQUOR PUMP DISCHARGE LINE OPEN INLET VALVE TO KINNEY STRAINER.
12. WHEN BLANK IS IN PLACE NOTIFY OVENS OF FLUSHING LIQUOR PUMP STARTUP.
13. START FLUSHING LIQUOR PUMPS.
14. WHEN FLOW IS ESTABLISHED OVENS SHUT DOWN MILL WATER AND RETURN TO NORMAL OPERATION.
15. SLIP BLANK NORTH DECANTER INLETS AND TAR WEIR.



FINAL COOLER AND AMMONIA ABSORBER BYPASS PURGE

PURPOSE: TO PURGE THE GAS PIPING FROM THE BLUE ROOM TO THE EXHAUSTER OUTLETS IN ORDER TO INSTALL TWO SLIP BLANKS AT THE FINAL COOLER INLET AND DISCHARGE GAS PIPING, CHANGE THE AMMONIA ABSORBER BYPASS VALVE, CLEAN #1 PRECIPITATOR DISCHARGE VALVE AND REMOVE TWO BLANKS IN THE MAIN GAS BLEEDER LINE TO RETURN THE BLEEDER ISOLATION VALVE AND THE BLEEDER BUTTERFLY VALVE INTO SERVICE.

PERSON IN CHARGE: BY-PRODUCTS AREA MANAGER

PERSONS INVOLVED: BY-PRODUCTS PERSONNEL  
MECHANICAL TECHNICIANS  
OVENS PERSONNEL  
UTILITIES PERSONNEL  
OUTSIDE CONTRACTOR

MATERIALS INVOLVED: COKE OVEN GAS  
NITROGEN

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

VALVE IDENTIFICATION:

A #1 LBA BY-PASS  
B #1 LBA DISCHARGE  
C OVENS UNDERFIRE SUPPLY  
D FUEL GAS BUTTERFLY ISOLATION (W)  
E BLEEDER ISOLATION  
F BLEEDER BUTTERFLY  
G FUEL GAS BUTTERFLY  
H FUEL GAS BUTTERFLY ISOLATION (E)  
I FUEL GAS BUTTERFLY BYPASS  
J #1 LBA INLET VALVE  
K #2 LBA DISCHARGE VALVE  
L #2 LBA BYPASS VALVE  
M #2 LBA INLET VALVE  
N FINAL COOLER DISCHARGE VALVE  
O FINAL COOLER BYPASS VALVE  
P FINAL COOLER INLET VALVE  
Q SECONDARY COOLER DISCHARGE VALVE  
R SECONDARY COOLER BYPASS VALVE  
S SECONDARY COOLER INLET VALVE  
T AMMONIA ABSORBER DISCHARGE VALVE  
U AMMONIA ABSORBER INLET VALVE  
V AMMONIA ABSORBER BYPASS VALVE  
W #3 TAR PRECIPITATOR DISCHARGE VALVE  
X #3 TAR PRECIPITATOR INLET VALVE  
Y #2 TAR PRECIPITATOR DISCHARGE VALVE  
Z #2 TAR PRECIPITATOR INLET VALVE  
AA #1 TAR PRECIPITATOR DISCHARGE VALVE  
BB #1 TAR PRECIPITATOR INLET VALVE



VALVE IDENTIFICATION CONTINUED:

CC	#1 TAR PRECIPITATOR BYPASS VALVE
DD	STEAM EXHAUSTER CHAIN VALVE
EE	O'HEARN VALVE
FF	#3 BOOSTER DISCHARGE VALVE
GG	STEAM EXHAUSTER DISCHARGE VALVE
HH	ELECTRIC EXHAUSTER DISCHARGE VALVE
II	MARTELLO VALVE
JJ	WALL BLEEDER VALVE
1	2" VALVE NORTH OF #1 LBA
2	2" VALVE ON BY-PASS LOOP FOR FUEL GAS BUTTERFLY
3	2" VALVE ON END OF LINE FROM VALVE #1
4	3/4" VALVE TOP OF BLEEDER LINE
5	3/4" VALVE ON GAS INLET TO BLEEDER STACK
6	3" VENT TOP OF FINAL COOLER
7	2" VENT TOP OF AMMONIA ABSORBER
8	1 1/2 " VENT FROM AMMONIA ABSORBER BYPASS LINE
9	1 1/2 " VENT FROM AMMONIA ABSORBER INLET LINE
10	#3 PRECIPITATOR NORTH EAR VENT
11	#3 PRECIPITATOR REHEATER VENT
12	#3 PRECIPITATOR SOUTH EAR VENT
13	#2 PRECIPITATOR NORTH EAR VENT
14	#2 PRECIPITATOR REHEATER VENT
15	#2 PRECIPITATOR SOUTH EAR VENT
16	#1 PRECIPITATOR NORTH EAR VENT
17	#1 PRECIPITATOR REHEATER VENT
18	#1 PRECIPITATOR SOUTH EAR VENT
19	1" VENT NEAR #3 BOOSTER DISCHARGE TIE IN
20	1 1/2" VENT SE CORNER OF EXHAUSTER ROOM
21	STEAM EXHAUSTER U SEAL VENT
22	ELECTRIC EXHAUSTER U SEAL VENT
23	WALL BLEEDER DRAIN IN BASEMENT
24	WALL BLEEDER DRAIN OPERATING FLOOR

INITIAL CONDITIONS:

VALVE		
A	CLOSED	#1 LBA BY-PASS
B	OPEN	#1 LBA DISCHARGE
C	OPEN	OVENS UNDERFIRE SUPPLY
D	OPEN	FUEL GAS BUTTERFLY ISOLATION (W)
E	OPEN	BLEEDER ISOLATION
F	CLOSED	BLEEDER BUTTERFLY
G	OPEN	FUEL GAS BUTTERFLY
H	OPEN	FUEL GAS BUTTERFLY ISOLATION (E)
I	CLOSED	FUEL GAS BUTTERFLY BYPASS
J	OPEN	#1 LBA INLET VALVE
K	OPEN	#2 LBA DISCHARGE VALVE
L	CLOSED	#2 LBA BYPASS VALVE
M	OPEN	#2 LBA INLET VALVE
N	OPEN	FINAL COOLER DISCHARGE VALVE
O	OPEN	FINAL COOLER BYPASS VALVE



INITIAL CONDITIONS CONTINUED:

VALVE

P	CLOSED	FINAL COOLER INLET VALVE
Q	OPEN	SECONDARY COOLER DISCHARGE VALVE
R	CLOSED	SECONDARY COOLER BYPASS VALVE
S	OPEN	SECONDARY COOLER INLET VALVE
T	OPEN	AMMONIA ABSORBER DISCHARGE VALVE
U	OPEN	AMMONIA ABSORBER INLET VALVE
V	CLOSED	AMMONIA ABSORBER BYPASS VALVE
W	OPEN	#3 TAR PRECIPITATOR DISCHARGE VALVE
X	OPEN	#3 TAR PRECIPITATOR INLET VALVE
Y	OPEN	#2 TAR PRECIPITATOR DISCHARGE VALVE
Z	OPEN	#2 TAR PRECIPITATOR INLET VALVE
AA	BLANKED	#1 TAR PRECIPITATOR DISCHARGE VALVE
BB	BLANKED	#1 TAR PRECIPITATOR INLET VALVE
CC	CLOSED	TAR PRECIPITATOR BYPASS VALVE
DD	OPEN	STEAM EXHAUSTER CHAIN VALVE
EE	OPEN	O'HEARN VALVE
FF	BLANKED	#3 BOOSTER DISCHARGE VALVE
GG	OPEN	STEAM EXHAUSTER DISCHARGE VALVE
HH	CLOSED	ELECTRIC EXHAUSTER DISCHARGE VALVE
II	CLOSED	MARTELLO VALVE
JJ	CLOSED	WALL BLEEDER VALVE
1	OPEN	2" VALVE NORTH OF #1 LBA
2	CLOSED	2" VALVE ON BY-PASS LOOP FOR FUEL GAS BUTTERFLY
3	CLOSED	2" VALVE ON END OF LINE FROM VALVE #1
4	CLOSED	3/4" VALVE TOP OF BLEEDER LINE
5	CLOSED	3/4" VALVE ON INLET GAS LINE TO BLEEDER STACK
6	CLOSED	3" VENT TOP OF FINAL COOLER
7	CLOSED	2" VENT TOP OF AMMONIA ABSORBER
8	CLOSED	1 1/2 " VENT FROM AMMONIA ABSORBER BYPASS LINE
9	CLOSED	1 1/2 " VENT FROM AMMONIA ABSORBER INLET LINE
10	CLOSED	#3 PRECIPITATOR NORTH EAR VENT
11	CLOSED	#3 PRECIPITATOR REHEATER VENT
12	CLOSED	#3 PRECIPITATOR SOUTH EAR VENT
13	CLOSED	#2 PRECIPITATOR NORTH EAR VENT
14	CLOSED	#2 PRECIPITATOR REHEATER VENT
15	CLOSED	#2 PRECIPITATOR SOUTH EAR VENT
16	OPEN/BLANKED	#1 PRECIPITATOR NORTH EAR VENT
17	OPEN/BLANKED	#1 PRECIPITATOR REHEATER VENT
18	OPEN/BLANKED	#1 PRECIPITATOR SOUTH EAR VENT
19	CLOSED	1" VENT NEAR #3 BOOSTER DISCHARGE TIE IN
20	CLOSED	1 1/2" VENT SE CORNNER OF EXHAUSTER ROOM
21	CLOSED	STEAM EXHAUSTER U SEAL VENT
22	CLOSED	ELECTRIC EXHAUSTER U SEAL VENT
23	CLOSED	WALL BLEEDER DRAIN IN BASEMENT
24	CLOSED	WALL BLEEDER DRAIN OPERATING FLOOR

SCOPE OF WORK: INSTALL TWO SLIP BLANKS IN COKE GAS VALVES AT INLET AND DISCHARGE OF FINAL COOLER, REPLACE AMMONIA ABSORBER BYPASS VALVE DISC AND BONNET, REMOVE AND CLEAN #1 TAR PRECIPITATOR DISCHARGE VALVE THEN REPLACE AND REMOVE TWO BLANKS IN THE MAIN COKE OVEN GAS BLEEDER LINE, RETURNING IT TO SERVICE.



PROCEDURE:

1. ISOLATE AMMONIA STILL AND ONE OF THE LBA'S ON MIDNIGHT TURN.
2. NOTIFY OVENS AND UTILITY DEPARTMENTS OF START OF SHUT DOWN.
3. NOTIFY OVENS HEATING DEPARTMENT TO PUT BATTERIES INTO NEUTRAL.
4. NOTIFY OVENS THAT EXHAUSTER IS ABOUT TO BE SLOWED CAUSING THE GAS TO BACK UP TO THE BATTERY. SHUT POWER OFF TO TAR PRECIPITATORS.
5. SLOW DOWN EXHAUSTER AND PUT BATTERY ON PRESSURE, KEEPING A POSITIVE PRESSURE ON SYSTEM (70cm H<sub>2</sub>O) AND THEN STOP BOOSTERS. MAKE SURE ONCE BLEEDERS ARE BLEEDING AND IGNITED CLOSE PILOT GAS VALVES, AND ENRICHMENT GAS AT FURNACE PLANT.
6. CLOSE VALVE D AND WATER SEAL.
7. OPEN BY-PASS VALVE ON BOOSTER, NOTIFY UTILITY DEPARTMENT TO KEEP LINE PRESSUREIZED WITH LTV'S GAS.
8. CLOSE VALVE C AND WATER SEAL SAME AND OPEN TIE LINE BETWEEN THE INNER PLANT GAS MAIN AND THE FUEL GAS MAIN.
9. SLOW THE EXHAUSTER TO 600 rpm AND OPEN BYPASS, OPEN VALVES A AND R, CLOSE VALVE B, J, Q AND S, WATER SEAL BOTH B, J, Q AND S.
10. SHUT WATER TO PLATE AND FRAME HEAT EXCHANGERS OFF, ISOLATE ALL MAKE UP TO SECONDARY COOLER AND SHUT DOWN CIRCULATION LIQUOR AND WSAC WATER, SHUT DOWN LIGHT OIL PLANT AND PUT STEAM PURGE ON BOTH LBA'S AND THE SECONDARY COOLER.
11. OPEN VALVES #2,6 THROUGH #15,#19 THROUGH #23 FOR PURGE POINTS.
12. INTRODUCE PURGE THROUGH VALVE #3 AT 2cm Hg AND INTRODUCE CO<sub>2</sub> PURGE INTO WALL BLEEDER LINE IN BASEMENT.
13. ONCE ALL VALVES ARE WATER SEALED AND PURGE POINT AT VALVE #2,6 THROUGH #15,#19 THROUGH #23 ARE LESS THAN 5% LEL CONTINUE.
14. CONTINUE PURGE AT SAME FLOW RATE AND OPEN VALVE II AND THEN CLOSE VALVE EE
15. CONTINUE PURGE FOR AT LEAST TEN MINUTES LONGER.



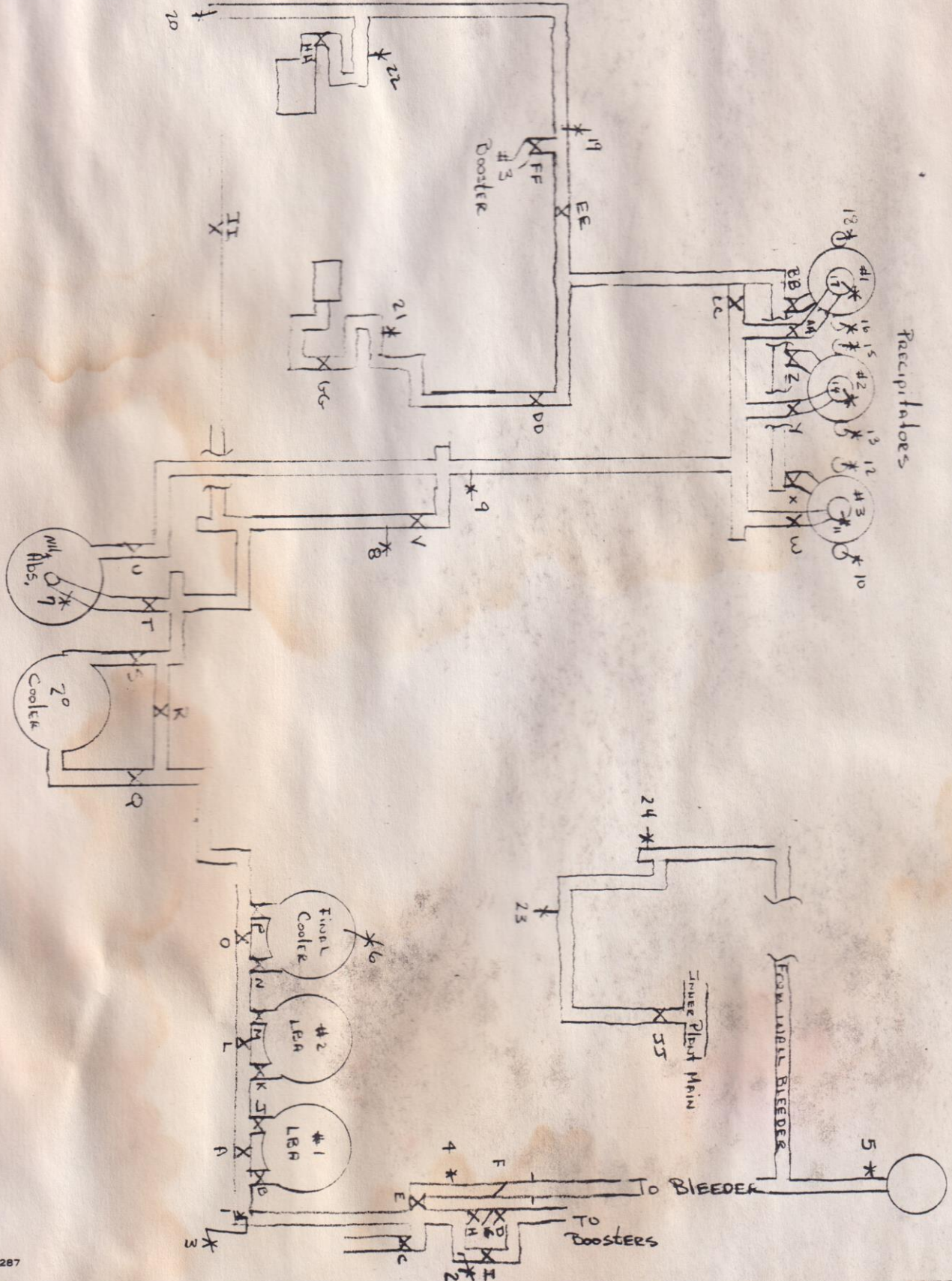
16. CHECK VALVE #18 AND #20 IF LESS THAN 5% LEL THEN DROP PURGE TO TANK PRESSURE.
17. INSTALL BLANKS AT THE FINAL COOLER VALVES FIRST THEN STOP THE PURGE AND FINISH REST OF SCOPE OF WORK.
18. ONCE ALL WORK IS COMPLETE CONTINUE.
19. INTRODUCE CO<sub>2</sub> PURGE INTO WALL BLEEDER LINE IN BASEMENT.
20. BRING NITROGEN PURGE BACK UP TO 2cm Hg AND PURGE THROUGH VALVE #2,6 THROUGH #15,#19 THROUGH #23.
21. ONCE PURGE AT VALVE #2,6 THROUGH #15,#19 THROUGH #23. ARE AGAIN LESS THAN 5% LEL FOR TEN MINUTES NITROGEN PURGE IS COMPLETE. CLOSE VALVE #2,6 THROUGH #15,#19 THROUGH #23.
22. DROP WATER SEAL ON STEAM EXHAUSTER DISCHARGE U-SEAL AND OPEN, PURGE THROUGH VALVE #2 AND MAIN BLEEDER UNTILL LEL IS 100% AND GAS WILL SUPPORT COMBUSTION.
23. NOTIFY OVENS THAT EXHAUSTER IS ABOUT TO BE STARTED UP.
24. START UP EXHAUSTER AND CLOSE BY-PASS VALVE.
25. DROP WATER SEALS ON VALVES Q AND B CLOSE STEAM PURGES ON SECONDARY COOLER AND #1 LBA OPEN VALVES Q AND B, PURGE THROUGH THE RESPECTIVE VENT UNTILL PURGE WILL SUPPORT COMBUSTION. START UP SECONDARY COOLER AND LIGHT OIL PLANT.
26. DROP WATER SEAL ON VALVE D AND OPEN.
27. START UP BOOSTER TRYING TO MAINTAIN 50cm H<sub>2</sub>O ON INLET.
27. NOTIFY BOILER HOUSE THAT BOOSTER HAS BEEN STARTED.
28. ONCE EXHAUSTER IS ON LINE AND SUCTION HAS BEEN ESTABLISHED NOTIFY OVENS BASEMENT THAT FUEL GAS WILL BE REESTABLISHED.
30. DROP WATER SEAL OM VALVE C AND OPEN, HAVE OVENS PUT ONE BATTERY ON AT A TIME AND OVENS CAN GO BACK PUSHING AND CHARGING. PUT WATER BACK ON THE PLATE AND FRAMES AS NEEDED.
31. ONCE BOTH BATTERIES ARE ON LINE UNDERFIRING NOTIFY BOILER HOUSE THEY SHOULD NOW HAVE GAS.
32. RETURN TO NORMAL BOOSTER OPERATION USING WALL BLEEDER TO CONTROL PRESSURE AS NEEDED.
33. AFTER ONE HALF HOUR TURN POWER TO PRECIPITATORS BACK ON.
34. NOTIFY OVENS AND BOILER HOUSE THAT ALL CONDITIONS ARE NORMAL AND LTV GAS CAN BE ISOLATED.



JOB TITLE

ENGINEER PROJECT

PAGE DATE





JOB TITLE:

ISOLATE COKE OVEN FUEL GAS PIPING # 1 BATTERY FROM THE PRE-HEATER TO THE RUPTURE DISC. PURGE OUT COKE OVEN GAS FROM THE FUEL GAS MAIN.

SCOPE OF WORK:

USE CARBON DIOXIDE (CO2) TO PURGE COKE OVEN GAS FROM # 1 PRE-HEATER TO THE RUPTURE DISC. TO INSTALL A SLIP BLANK BELOW PRE-HEATER VALVE A AND MAINTAIN A WATER SEAL ABOVE VALVES A AND B.

HAZARDS INVOLVED  
COKE OVEN GAS  
CARBON DIOXIDE

SAFETY EQUIPMENT  
COMBUSTION ANALYZER  
FIRE EXTINGUISHER  
NON-SPARKING TOOLS  
AIR PACKS  
GAS SAMPLING BAG  
STANDARD PERSONAL  
SAFETY EQUIPMENT

BEGINNING SYSTEM CONDITION:

FUEL GAS PIPING TO # 1 BATTERY IS 40 TO 110 CM. WATER AT START OF PURGE. # 2 BATTERY OPERATING AT NORMAL CONDITION.

PREPARATIONS:

1. SOAK BOLTS WITH PENETRATING SOLVENT TO INSURE EASY REMOVAL.
2. LUBRICATE AND WORK VALVES A AND B.
3. HOOK UP PURGE LINE TO POINT I AND II.
4. POST FIRE WATCH AT DISCHARGE VENTS V1 AND WATER OVERFLOW.

PROCEDURE:

1. NOTIFY S.F. PLACE BATTERY INTO NEUTRAL. STOP PUSHING.
2. FULL AND LOCKOUT REVERSING MACHINE. ALL CRAFTS TO INSTALL THEIR OWN LOCKS.
3. A. CUT STACK TO 5 INCH.  
B. CHECK WASTE HEAT MUSHROOMS.  
C. CHECK ALL COMBUSTION AIR LIDS. *Lock out Duke engine*  
D. SHUT OFF DECARBONIZING AIR FAN.  
E. CLOSE ALL EMERGENCY COCKS. CLOSE ALL DE-CARB AIR VALVES.  
F. INSTRUMENT MAN TO INSTALL MANOMETER TO MONITOR PURGE AND DISCONNECT RECORDERS.
4. VALVES A AND B ARE TO BE CLOSED. START WATER SEAL AT VALVE W. WATER SEAL IS COMPLETED WHEN WATER OVERFLOW IS MAINTAINED.
5. AFTER WATER SEAL IS ESTABLISHED BEGIN PURGE AT POINTS I AND II. OPEN DISCHARGE VENT V1. MAINTAIN POSITIVE PRESSURE. PRESSURE NOT TO EXCEED 2PSIG.  
NOTICE: IF WATER SEAL IS NOT OBTAINED NO WORK IS TO START.
6. CHECK VENTS V1 FOR COMPLETE PURGE. USE COMBUSTION GAS ANALYZER AND GAS SAMPLING BAG. PURGE IS COMPLETE WHEN AN LEL BELOW 2 PERCENT IS ACHIEVED.
7. WHEN PURGE IS COMPLETED, SLIP BLANK MAY BE INSTALLED.

*Chair  
A+B*





5:00 AM

START purge 6:00 AM

→ Purge out by 7:00 AM

8:00 - Noon

1:00 PM X

### JOB TITLE

Isolate coke oven fuel gas piping #2 Battery from the pre-heater to the rupture disc. To purge out coke oven gas from the fuel gas main.

### SCOPE OF WORK

Use carbon dioxide (CO<sub>2</sub>) to purge coke oven gas from #2 pre-heater to the rupture disc. To install a slip blank below pre-heater valve A and to maintain a water seal above valves A and B. To remove the rupture disc and to open the 24 inch cross. To use a rake and or auger to remove material that has built up inside the main around the emergency cocks. To install the 10 inch temporary coke oven gas line to the existing line at point X (see sketch). To blank the 10 inch line at point X ( see sketch). To disconnect the decarb air blower and install an elbow ( see L on sketch) . To reconnect the decarb air blower.

### HAZARDS INVOLVED

Coke oven gas  
Carbon Dioxide

### SAFETY EQUIPMENT

Carbon dioxide  
Combustion Analyzer  
Fire extinguishers  
Non-sparking tools  
Air packs  
Gas sampling bag  
Safety belts, harnesses  
Standard Personal  
Safety equipment

### BEGINNING SYSTEM CONDITION

Fuel gas piping to #1 and 2 battery is 40 to 110 cm H<sub>2</sub>O col. at start of purge. # 1 and 2 battery operating at normal condition.

### PREPARATIONS

1. Soak bolts with penetrating solvent to insure easy removal
2. Exercise valves A and B.
3. Hook purge line up to point I and II.
4. Post fire watch at discharge vent V 1.

### PROCEDURE

1. Notify BP and Boiler House 30 min. prior to placing battery into neutral. Notify both again 5 min. before purge is to start.
2. Pull and lock out reversing machine. All crafts to install their own locks. Lock out Dake engine, valves A and B.
3. a. Cut stack to 5mm  
b. Check waste heat mushrooms.  
c. Check air box lids.  
d. Shut off decarb air fan.  
e. Shut off emergency cocks.  
f. Instrument man disconnect meters.  
g. Install manometer to monitor purge pressure.



4. Close valve A and B. Start water seal at valve W. Water seal is complete when water over flow is maintained.

**CAUTION : WATER SEAL MUST BE ESTABLISHED BEFORE CONTINUING**

5. After water seal is established begin purge at points I and II. Open discharge vent V 1. Maintain positive pressure BELOW 2 PSIG.

6. Check vents V 1 for complete purge. Gas bag sample must not burn. LEL must be below 5%.

7. When purge is completed , slip blanks may be installed.

**RETURNING BATTERY TO SERVICE**

1. Crafts have completed all work and have removed their locks.

2. Start purge at points I and II. Maintain a positive pressure of .5 to 1.5 psig. DO NOT EXCEED 2.0 PSIG.

3. Use soap bubbles to check any connections . Tighten connections as needed. Any air that has entered the line is now being purged out at vent V 1.

4. Establish an oxygen reading below 5% O<sub>2</sub>.

5. Close vent V 1 .

6. Stop the purge. Pull the blank at valve A.

7. Drop the water seal .

8. Open coke oven gas valve A. Open vent V1.

9. Maintain a positive pressure and sample vented gas. An analyzer reading of 100% coke oven gas must be obtained. A gas bag sample must burn.

10. Check underfire system for leaks.

11. Place battery on correct zone. Raise stack draft to operating level.

12. Open emergency cocks to the ON ZONE. When all are open , open the emergency cocks to the OFF ZONE. Establish proper gas flow.



WWP/CHANG

Job Title

Removing Existing Battery #1 and Battery #2 Bleeder Stacks  
Replacing Existing Battery #1 and Battery #2 Bleeder Stacks

Scope of Work

All four bleeder stacks that are mounted on top of the collector mains are to be removed and replaced with new ones.

Hazards Involved  
Coke Oven Gas  
Hot Liquor  
Hot Surfaces

Safety Equipment  
Non Sparking tools  
Steam Lances  
Standard Personal  
Safety Equipment

Beginning System Condition

Collector main back pressure is set at 12 mm on #1 Battery and 13mm on Battery #2. Liquor pressure is set at 20psig for both batteries. All four stack dampers are closed and holding liquor.

Preparations

Connect steam hoses and steam lances to steam supply. Hoses must be long enough to be inserted into the collector mains and aimed at the inside of the stack damper ; and long enough to be stationed on the outside of the stack damper. A mill water line must be connected to the existing damper spray so that it will operate independently of the liquor spray. Replace old stack bolts. The collector mains are to have had their impulse lines steamed out and the control regulators calibrated the previous 24 hours. Spraymen will attend the steam lances and liquor lines. An instrumentman will be present and stationed in the Askania house. A Topforeman and a Heater's Foreman will be present at all times.

Procedure

1. All preparations must have been made prior to starting this job. Spraymen , Instrumentman and Foremen are attending their stations.
2. The collector main will be operating at normal back pressure.
3. Turn on mill water supply to the stack damper. Shut off liquor supply to the stack damper. Mill water pressure is higher than the liquor pressure and will deliver more water to the damper pan.
4. Close and lock down the damper so that it cannot be accidentally opened.
5. Pushing and charging may have to stop in order to accommodate the equipment needed to remove and replace the stack.
6. Old stack can be removed and the new stack can be installed.
- 7.. Normal pushing and charging can resume.



## SULFATE KILL

When the circulating liquor reaches a specific gravity of 1.230 hot shut off acid addition. Continue to circulate the solution, slowly dropping the tank upstairs into the solution tank and sending solution back upstairs until the solution is neutral 0 in all tanks. After the concentration has reached 0% by titration method with the IN NaOH solution continue to circulate the system. Now check solution samples using the 1-12 accutint or tridicator ph paper. When the solution has reached a neutral ph of 6.5 - 7.0 the system is now ready for a kill.

Now open valve to filter unit and to slurry storage tank outside and now close the discharge valves on the slurry pump which go back into the suspension tank. Now using the slurry pump to fill sulfate storage tank through the filter unit start the kill of the ammonia absorber system. Bring the level of the circulating tank down to the point where the suction line which leads to the bottom of the tank is exposed about one (1) foot below elbow in tank. Now drain the tank upstairs slowly into the circulation tank trying to maintain the low level of the circulating liquor tank.

Now open the make up water valve to the circulation tank enough to maintain the level at one (1) foot below elbow inside of tank. Monitor the water level very closely. The pump is not be allowed to go on suction or should the tank level to go up.

Now that the water is being added to the circulation tank and the slurry pump is only pumping sulfate solution through the filter out to the sulfate storage tank, a sample should be drawn off the slurry pump and checked for specific gravity using the large hydrometer (1.000 - 1.200) this should be checked every 10 to 15 minutes. When the sample from the slurry pump reaches a specific of 1.190 hot the kill is now complete and the slurry pump can be set up to recirculate the suspension tank again. The lines going to the filter unit and sulfate storage tank should be flushed with water for 5 minutes then drained out completely.

Now add water to the circulation tank to fill it up to 3'-4' feet from the top of tank. The acid is now turned on and it's concentration brought up to 4%.

The kill is now complete.

\* In the winter months the line going to the storage tank should be steamed out after every kill.



4:30 truck here  
5:30 Purge

T4 tower check valve for  
Purge

Page 1

INTERPLANT COKE OVEN GAS MAIN PURGE

**PURPOSE:** To purge the gas piping from the Blue Room to the Furnace Plant Isolation Valve, to ~~tie-in a new section of piping~~ and preform other repairs.

**PERSON IN CHARGE:** By-products Area Manager

**PERSONNEL INVOLVED:** By-products personnel  
Utility department personnel  
Coke Plant Maintenance (CPM)  
Mechanical Technicians  
Furnace Plant Maintenance Personnel (FPM)  
Mechanical Technicians  
USICO - Nitrogen supplier

**MATERIALS INVOLVED:** Coke Oven Gas (COG)  
Nitrogen gas (N<sub>2</sub>)  
Coke Oven Gas Deposits

**TOOLS NEEDED:** Non-sparking Tools  
Gas Detector (LEL & O<sub>2</sub>)  
Gas Bag and Lighter

**BLANKS:** Plant Pressure Regulation Butterfly Isolation Valve  
Wall Bleeder Line, base of drip leg before exiting Exhauster Room - completed  
~~each of the COG lines to the Boilers (4)~~  
~~COG enrichment line to the Furnace Stoves~~  
~~COG Main from LTV Steel Coke Plant~~  
~~COG feed to the boiler pilots~~

*Block + Bleed*



INTERPLANT COKE OVEN GAS MAIN PURGE  
NOVEMBER 8, 1994

SCOPE OF WORK: COKE PLANT

1. Replace #1 Booster Discharge Valve.
2. Install Blanks in gas lines for #1 Booster
3. Change the nozzle to the 9# automatic bleeder.



PROCEDURE:

1. Notify ovens control room of start of shutdown - higher fuel gas pressure due to bleeder control valve setting (approx. 70 cm. H<sub>2</sub>O.)
2. Notify utility foreman of start of shutdown - allow 1/2 hour delay for shutting all gas off of the boilers, slow booster to maintain a maximum 4 lbs. pressure.
3. Lower bleeder butterfly valve (A) to lowest set point - approximately 70 cm. H<sub>2</sub>O.
4. Once all of the coke oven gas is off the boilers shut down the boosters.
5. Open all three (3 - I, J & K) booster by-pass valves wide open and open the two (2 - C & E) booster inlet valves on the boosters that were off line.
6. Set plant pressure regulation butterfly valve (B<sub>1</sub>) to the closed position.
7. Close west isolation valve for the plant pressure regulation butterfly valve (B<sub>1</sub>) and water seal.



8. Notify utilities foreman to open the bleeder valves on the furnace side. (may bleed to enrichment line if purge is slow)
9. Open valve #3 to introduce nitrogen into interplant cog main at 3 lbs. to 6 lbs. pressure. *T4 Tower*
10. Open bleeder valve #1 at the blue room and valve #15 at the dumper spur track heating station.
11. Monitor pressure of nitrogen purge with a mercury manometer at valves #4 & #8.
12. Monitor purge regularly at valve #1 at the blue room and valve #15 at the dumper spur track heating station.
13. When Lower Explosive Limit (LEL) is below 5% and purge gas will not support combustion at valves #1 and #15 close these valves. (approximately one (1) hour.)
14. Close booster inlet valves <sup>C/D&E</sup> and regulate purge to blue room using booster by-pass valve I, monitoring pressure at valve #4 keeping slightly positive pressure. Maintain full purge pressure to furnace plant.

*Adjust Blasts  
to Clean Boiler Valve*



15. Open bleeder valve #2. Have CPM install blank at blue room on horizontal flange west of plant pressure regulation butterfly isolation valve B<sub>1</sub>.
16. After blank is installed and all bolts are tight open booster by-pass valve I wide open and open booster inlet valves E&D, continue full pressure purge through valve #2 for fifteen (15) minutes or until LEL is less than 5% and Oxygen (O<sub>2</sub>) is less than 2% whichever is longer. Then close valve #2.
17. When utility foreman notifies the by-products area manager that the purge is complete, i.e.: less than 5% LEL and purged gas will not support combustion. Lower nitrogen pressure to tank pressure.
18. Notify utility foreman to have FPM install blank at the furnace plant.
19. Once all blanks are in place and bolts are tight, the FPM & CPM will be given the go ahead to start their work.
20. See scope of work. Schedule is to start repurge 4 hours after start of blanking #1 booster.



22. When all new piping is in place and bolts are tight, all inspection ports are closed up and tight and blind flanges are bolted up tight the purge of  $O_2$  with  $N_2$  will begin.
23. Introduce  $N_2$  at valve #3 - open valves #2 and #15 and all furnace plant bleed valves.
24. Slowly raise pressure to 3 lbs. to 5 lbs. check all new connections for leaks.
25. When purged gas at valve #2 & #15 remain at less than 5%  $O_2$  for 20 minutes and will not support combustion, close valves #2 & #15.
26. When utility department confirms that purged gas at their bleeders is less than 5%  $O_2$  for 10 minutes continue.
27. Drop  $N_2$  truck to tank pressure.
28. FPM to remove blanks on furnace plant piping.
29. Raise  $N_2$  pressure to 9 lbs., close most bleed points and check all flanges where blanks were removed.
30. Lower  $N_2$  pressure to tank pressure.



31. CPM to remove blank at blue room.
32. Open valve #1 and purge any  $O_2$  out of piping, about 10 minutes or until less than 5%  $O_2$  and will not support combustion. When flange is tight raise pressure of  $N_2$  to 9 lbs. and check flange for leaks.
33. Lower  $N_2$  to tank pressure and drop water seal on valve  $B_1$ , open valve  $B_2$  and close valve #3 stopping the  $N_2$  purge.
34. Open all bleeders at the furnace plant and valves #1 & #15.
35. Lower plant pressure regulation butterfly valve to control at 56 cm.  $H_2O$  and return to automatic control.
36. When cog at valve #1 will support combustion close valve.
37. When cog at valve #15 will support combustion close valve.
38. When cog at valve #9 will support combustion close valves C&D the booster inlet valves.
39. Open valve G, #2 booster discharge valve if it isn't open already.
40. Notify utility foreman that the booster is about to be started



up.

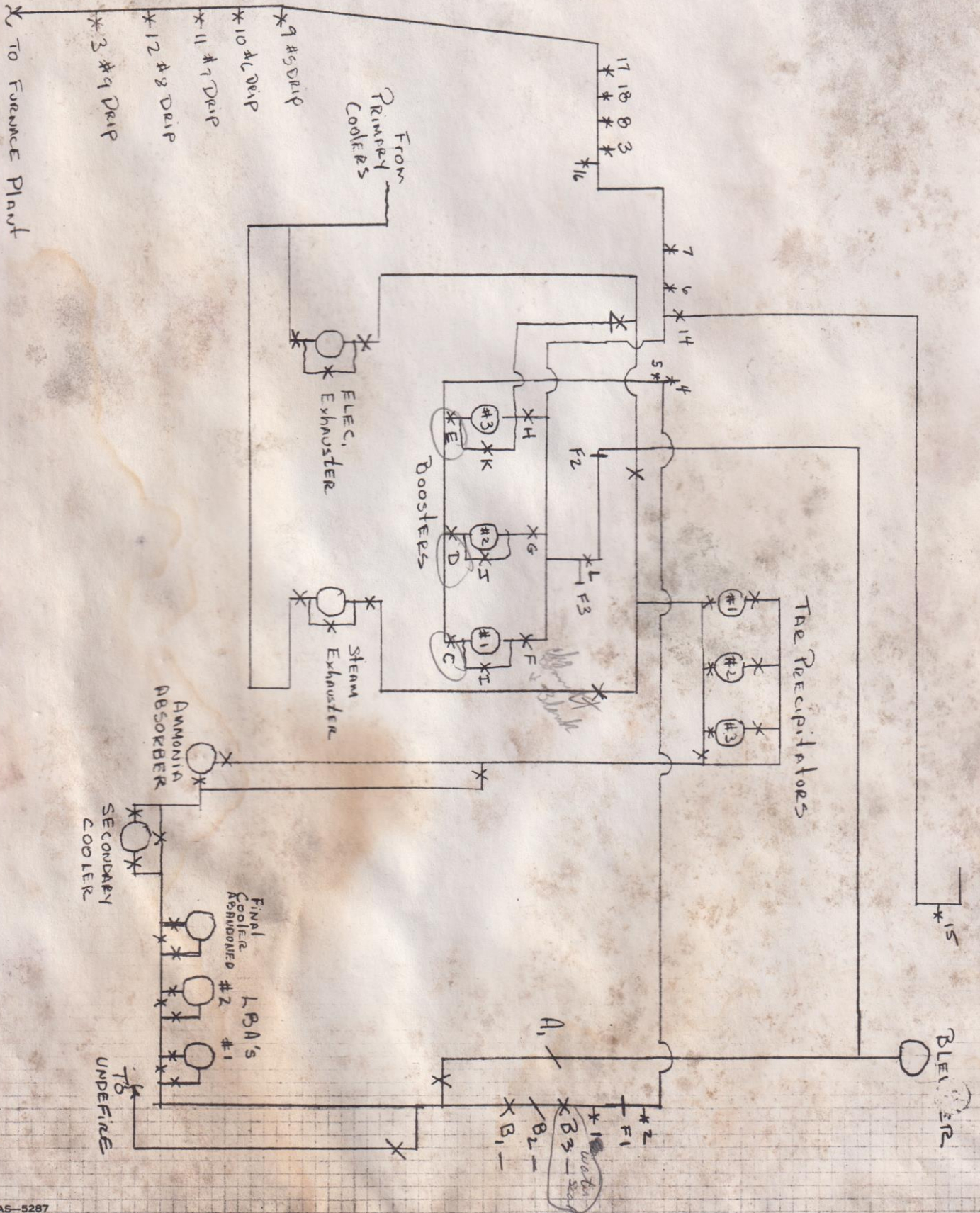
41. Close booster by-pass valves I, J & K, then start up #2 booster slowly.
42. Raise bleeder butterfly valve set point to <sup>70</sup>~~100~~ cm. H<sub>2</sub>O.
43. Control booster speed to maintain 10 cm. H<sub>2</sub>O suction pressure and less than six (6) pounds discharge pressure.
44. When utility foreman has good cog throughout his system, light pilots for boilers and put boilers on cog.
45. ~~Open valves #17 & #18, notify ovens shift supervisor to light pilots on collector main bleeder stacks.~~
46. Return booster operation to normal. (no wall bleeder)
47. Notify ovens control room of completed job.



JOB TITLE

ENGINEER PROJECT

PAGE DATE





4:00  
PM

SCOPE OF WORK  
GAS SHUTDOWN 11/02/90

REPLACE 30 INCH GAS PIPING FROM AMMONIA ABSORBER BYPASS SPOOL PIECE TO NORTHEAST CORNER OF EXHAUSTER BUILDING.

REPLACE SPOOL PIECES ON #1 AND #3 TAR PRECIPITATORS.

REMOVE 30 INCH ELBOW BY AMMONIA SULFATE BYPASS.

REPLACE DRAIN VALVE ON FINAL COOLER BOOT.

REPLACE MAIN STEAM OUT ON 2 INCH VALVE ON FINAL COOLER.

REPLACE VENT VALVES ON ALL THREE TAR PRECIPITATORS.

UNPLUG #3 TAR PRECIPITATOR SOUTH EAR.

UNPLUG #1 TAR PRECIPITATOR NORTH EAR.?

STARTING CONDITIONS FOR SHUTDOWN

ABSORBER ON LINE.

ELECTRIC EXHAUSTER ON LINE.

MARTELLO VALVE CLOSED.

O'HEARN VALVE OPEN.

STEAM EXHAUSTER DISCHARGE AND CHAIN VALVE CLOSED.

FINAL COOLER ISOLATED AND STEAM PURGED.

STARTING CONDITIONS FOR RE-PURGE

SYSTEM DOWN.

FINAL COOLER INLET, DISCHARGE, AND BYPASS CLOSED AND WATER SEALED.

FINAL COOLER ISOLATED AND STEAM PURGED.

ELECTRIC EXHAUSTER DISCHARGE CLOSED.

~~ELECT~~ STEAM EXHAUSTER "U" TUBE WATER SEALED.

ELECTRIC EXHAUSTER IDLING ON PONY MOTOR.

#2 LBA INLET CLOSED.

FUEL GAS SYSTEM AND REPUBLIC MAIN PRESSURIZED FROM LTV.

MARTELLO VALVE OPEN

O'HEARN VALVE CLOSED.



1. SHUTDOWN TAR PRECIPITATORS. *Elect*
2. SHUTDOWN AMMONIA STILL - CLOSE VAPOR LINE VALVE "T" TO ABSORBER.
3. SHUTDOWN AMMONIA ABSORBER SOLUTION PUMPS - ISOLATE SPRAYS.
4. HOOK UP NITROGEN PURGE TRUCK AT FINAL COOLER.
5. NOTIFY OVENS OF IMMINENT BOOSTER SHUTDOWN.
6. LOWER COKE GAS BLEEDER TO 70 CM.
7. NOTIFY CONTROL ROOM OF HIGH FUEL GAS PRESSURE (70 CM).
8. SHUTDOWN ONE BOOSTER AT A TIME OPENING BYPASS VALVES AS LAST BOOSTER IS SHUTDOWN.
9. MANUALLY CLOSE FUEL GAS BUTTERFLY VALVE AND HAVE INSTRUMENT DEPARTMENT REVERSE IMPULSE LINES ON THE FUEL GAS ASKANIA CONTROLLER TO MAINTAIN 60 CM PRESSURE TO OVENS CONTROL ROOM FROM 4 PSI GAS PRESSURE BEING SUPPLIED BY LTV. RAISE GAS BLEEDER SETTING TO 120 CM.
10. NOTIFY OVENS OF EXHAUSTER SHUTDOWN.
11. SHUT OFF WATER TO PLATE AND FRAMES.
12. CLOSE BURNER VALVES TO BLEEDERS.  
OVENS IN NEUTRAL.
13. ESTABLISH WATER SEAL ON FINAL COOLER BYPASS. *+ #2LBA*
14. START NITROGEN PURGE ON 4 INCHES OF MERCURY.
15. OPEN BYPASS ON ELECTRIC EXHAUSTER AND SLOW TO *low motor* ~~IDLE SPEED~~.
16. CLOSE ELECTRIC EXHAUSTER DISCHARGE VALVE AND ESTABLISH WATER SEAL ON ELECTRIC EXHAUSTER "U" TUBE.
17. OPEN PURGE VENTS ON TOP OF PRECIPITATORS.



18. OPEN VENT AT ELECTRIC EXHAUSTER "U" TUBE.  
OPEN VENT IN SOUTHEAST CORNER OF EXHAUSTER BUILDING (ON TOP OF GAS PIPING).  
OPEN VENT BETWEEN #2 AND #3 BOOSTER (ON TOP OF GAS PIPING).  
OPEN VENT ON DRIP LEG IN NORTHEAST CORNER OF EXHAUSTER BUILDING.  
OPEN VENT WEST OF AMMONIA ABSORBER BYPASS.  
OPEN VENT ON ABSORBER INLET, DISCHARGE AND TOP OF ABSORBER.
19. MONITOR PURGE POINTS FOR LEL.  
CLOSE VALVES AS LEL FALLS BELOW 5%.
20. ONCE ALL PURGE POINTS ARE BELOW 5% LEL OPEN MARTELLO VALVE AND CLOSE O'HEARN VALVE.
21. PURGE EAST WALL GAS PIPING IN EXHAUSTER BUILDING UNTIL LEL IS BELOW 5%.
22. LOWER PURGE PRESSURE.
23. WORK MAY BEGIN AT TAR PRECIPITATORS AND EXHAUSTER BUILDING NORTH WALL.
24. MONITOR WORK AREAS FOR GAS.
25. CLOSE INLET ON #2 LBA AND WATER SEAL.
26. WATER SEAL #2 LBA BYPASS.
27. OPEN DRAIN VALVE ON FINAL COOLER BOOT.
28. STEAM PURGE FINAL COOLER BOOT WITH STEAM UNTIL LEL IS BELOW 5% AT DRAIN VALVE.
29. REPLACE FINAL COOLER BOOT DRAIN VALVES.



1. WHEN MECHANICAL WORK IS DONE PURGE FROM FINAL COOLER THROUGH THE 2 INCH LINE ON ELECTRIC EXHAUSTER "U" TUBE FOR 5 MINUTES.
2. OPEN AMMONIA ABSORBER BYPASS.  
MONITOR PURGE POINTS AT ELECTRIC EXHAUSTER FOR OXYGEN.  
MONITOR PURGE POINTS AT O'HEARN VALVE FOR OXYGEN.
3. DROP WATER SEAL ON FINAL COOLER BYPASS VALVES AND #2 LBA INLET.
4. OPEN STEAM EXHAUSTER DISCHARGE VALVE - CHAIN VALVE.  
CLOSE OVEN BLEEDERS.
5. OPEN FINAL COOLER BYPASS, OPEN #2 LBA INLET.  
OVENS TO PUSH AND CHARGE 10 OVENS PER BATTERY TO ATMOSPHERE (20 TOTAL).
6. CLOSE FUEL GAS BUTTERFLY AND OPEN BLEEDER BUTTERFLY.
7. REVERSE IMPULSE LEADS ON FUEL GAS ASKANIA CONTROLLER.
8. CLOSE STEAM EXHAUSTER BYPASS VALVE UNTIL IT PICKS UP SUCTION FROM OVENS.
9. BLEED GAS FOR 10 MINUTES THROUGH BLEEDER STACK.
10. PRESSURIZE FUEL GAS MAIN THROUGH BUTTERFLY VALVE.
11. WHEN GAS FLOW IS SUFFICIENT START BOOSTERS.
12. OPEN FINAL COOLER INLET AND DISCHARGE VALVES.
13. START UP AMMONIA ABSORBER AND FINAL COOLER.
14. START UP AMMONIA STILL.
15. AFTER 20 OVENS ARE CHARGED - ENERGIZE TAR PRECIPITATORS.



BLEEDER VALVE PURGE

PURPOSE: TO PURGE THE GAS PIPING OVER THE BLUE ROOM IN ORDER TO INSTALL TWO SLIP BLANKS IN THE MAIN GAS BLEEDER LINE FOR REPAIR OF THE BLEEDER ISOLATION VALVE AND REPLACEMENT OF THE BLEEDER BUTTERFLY VALVE.

PERSON IN CHARGE: BY-PRODUCTS AREA MANAGER

PERSONS INVOLVED: BY-PRODUCTS PERSONNEL  
MECHANICAL TECHNICIANS  
OVENS PERSONNEL  
UTILITIES PERSONNEL  
OUTSIDE CONTRACTOR

MATERIALS INVOLVED: COKE OVEN GAS  
CARBON DIOXIDE

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

VALVE IDENTIFICATION:

A	#1 LBA BY-PASS
B	#1 LBA DISCHARGE
C	OVENS UNDERFIRE SUPPLY
D	FUEL GAS BUTTERFLY ISOLATION (W)
E	BLEEDER ISOLATION
F	BLEEDER BUTTERFLY
G	FUEL GAS BUTTERFLY
H	FUEL GAS BUTTERFLY ISOLATION (E)
I	FUEL GAS BUTTERFLY BYPASS
J	WALL BLEEDER VALVE
1	2" VALVE NORTH OF #1 LBA
2	2" VALVE ON BY-PASS LOOP FOR FUEL GAS BUTTERFLY
3	2" VALVE ON END OF LINE FROM VALVE #1
4	3/4" VALVE TOP OF BLEEDER LINE
5	3/4" VALVE ON GAS INLET TO BLEEDER STACK

INITIAL CONDITIONS:

VALVE

A	CLOSED	#1 LBA BY-PASS
B	OPEN	#1 LBA DISCHARGE
C	OPEN	OVENS UNDERFIRE SUPPLY
D	OPEN	FUEL GAS BUTTERFLY ISOLATION (W)
E	OPEN	BLEEDER ISOLATION
F	CLOSED	BLEEDER BUTTERFLY
G	OPEN	FUEL GAS BUTTERFLY
H	OPEN	FUEL GAS BUTTERFLY ISOLATION (E)
I	CLOSED	FUEL GAS BUTTERFLY BYPASS
J	CLOSED	WALL BLEEDER VALVE AND WATER SEALED
1	OPEN	2" VALVE NORTH OF #1 LBA
2	CLOSED	2" VALVE ON BY-PASS LOOP FOR FUEL GAS BUTTERFLY
3	CLOSED	2" VALVE ON END OF LINE FROM VALVE #1



INITIAL CONDITIONS CONTINUED:

VALVE

- |   |        |   |
|---|--------|---|
| 4 | CLOSED | 3/4" VALVE TOP OF BLEEDER LINE                |
| 5 | CLOSED | 3/4" VALVE ON INLET GAS LINE TO BLEEDER STACK |

SCOPE OF WORK: INSTALL TWO SLIP BLANKS IN COKE GAS BLEEDER LINE.

PROCEDURE:

1. NOTIFY OVENS AND UTILITY DEPARTMENTS OF START OF SHUT DOWN.
2. SLOW BOOSTERS UNTIL COKE GAS BLEEDER OPENS, REDUCE BLEED POINT TO 70cm H<sub>2</sub>O AND THEN STOP BOOSTERS.
3. CLOSE VALVE D AND WATER SEAL.
4. OPEN BY-PASS VALVE ON BOOSTER, NOTIFY UTILITY DEPARTMENT TO KEEP LINE PRESSUREIZED WITH LTV'S GAS.
5. NOTIFY OVENS HEATING DEPARTMENT TO PUT BATTERIES INTO NEUTRAL.
6. CLOSE VALVE C AND WATER SEAL SAME.
7. NOTIFY OVENS THAT EXHAUSTER IS ABOUT TO BE SLOWED CAUSING THE GAS TO BACK UP TO THE BATTERY. SHUT POWER OFF TO TAR PRECIPITATORS. MONITOR THE 2<sup>nd</sup> COOLER TEMPERATURE ADDING STEAM TO COOLING WATER AS NECESSARY.
8. SLOW THE EXHAUSTER TO 600 rpm AND OPEN BYPASS, CLOSE VALVE B AND WATER SEAL BOTH A AND B
9. SHUT WATER TO PLATE AND FRAME HEAT EXCHANGERS OFF.
10. OPEN VALVE #2 FOR PURGE POINT
11. INTRODUCE PURGE THROUGH VALVE #3 AT 2" Hg
12. ONCE ALL VALVES ARE WATER SEALED AND PURGE POINT AT VALVE #2 IS LESS THAN 5% LEL CONTINUE.
13. CONTINUE PURGE AT SAME FLOW RATE AND OPEN BUTTERFLY BLEEDER VALVE WIDE OPEN, DROP WATER SEAL AT THE BLEEDER STACK.
14. BLEED ABOUT 1 TON CARBON DIOXIDE THEN CHECK AT VALVE #4 . IF LESS THAN 5% LEL CONTINUE PURGE.
15. CHECK VALVE #5 IF LESS THAN 5% LEL THEN DROP PURGE TO TANK PRESSURE.
16. INSTALL BLANK AT THE BLEEDER ISOLATION VALVE FIRST THEN INSTALL THE BLANK AT THE FLANGE WEST OF THE BUTTERFLY VALVE.



17. ONCE ALL BLANKS ARE INSTALLED AND BOLTS ARE TIGHT CONTINUE
18. INTRODUCE STEAM PURGE INTO WALL BLEEDER LINE IN BASEMENT OF EXHAUSTER ROOM UNTILL STEAM PURGE CAN BE DETECTED AT THE BLEEDER STACK. THEN REESTABLISH WATER SEAL ON BLEEDER STACK.
19. BRING CARBON DIXOIDE PURGE BACK UP TO 2" Hg AND PURGE THROUGH VALVE #2
20. ONCE PURGE AT VALVE #2 IS AGAIN LESS THAN 5% LEL FOR TEN MINUTES CARBON DIOXIDE PURGE IS COMPLETE. CLOSE VALVE #2.
21. DROP WATER SEAL ON #1 LBA DISCHARGE VALVE AND OPEN, PURGE THROUGH VALVE #2 UNTILL LEL IS 100% AND GAS WILL SUPPORT COMBUSTION.
22. DROP WATER SEAL ON VALVE D AND OPEN.
23. NOTIFY OVENS THAT EXHAUSTER IS ABOUT TO BE STARTED UP.
24. START UP EXHAUSTER AND CLOSE BY-PASS VALVE.
25. START UP BOOSTER TRYING TO MAINTAIN 50cm H<sub>2</sub>O ON INLET.
26. NOTIFY BOILER HOUSE THAT BOOSTER HAS BEEN STARTED.
27. ONCE EXHAUSTER IS ON LINE AND SUCTION HAS BEEN ESTABLISHED NOTIFY OVENS BASEMENT THAT FUEL GAS WILL BE REESTABLISHED.
28. DROP WATER SEAL OM VALVE C AND OPEN, HAVE OVENS PUT ONE BATTERY ON AT A TIME AND OVENS CAN GO BACK PUSHING AND CHARGING. PUT WATER BACK ON THE PLATE AND FRAMES AS NEEDED.
29. ONCE BOTH BATTERIES ARE ON LINE UNDERFIRING NOTIFY BOILER HOUSE THEY SHOULD NOW HAVE GAS.
30. RETURN TO NORMAL BOOSTER OPERATION USING WALL BLEEDER TO CONTROL PRESSURE AS NEEDED.
31. AFTER ONE HALF HOUR TURN POWER TO PRECIPITATORS BACK ON.
32. NOTIFY OVENS AND BOILER HOUSE THAT ALL CONDITIONS ARE NORMAL AND LTV GAS CAN BE ISOLATED.





JOB TITLE

ENGINEER  
PROJECT

PAGE  
DATE

