**Boiler COFG stack below and top cover replacement work**

Objective Boiler COFG stack bellow and top cover replacement

Responsibility Engineer in charge and workmen at job

PPEs to be used Helmet, Safety shoes, safety hand gloves, ear plugs and

Nose mask, safety belt, safety net.

Aspect-Impact

Fumes, CO gas leakage air pollution

Noise generation noise pollution

Steel Scrap Resource Depletion

Water Spillage Land contamination

Hazards Identified

Mechanical Hazard Slip, fall and trap

Physical hazard Temperature

Health hazard CO/Oxygen gas

Human behavior Poor housekeeping, Non use of PPEs, Alcoholism,

Height phobia working at height.

SAFETY PRECAUTION

1. 24 volt DC supply should be used for providing illumination inside any confined space
2. Cotton/Leather hand gloves, nose mask, white/black goggles should be used

Proper checking of Welding machine, gas cutting set, grinding, cut off, flexible grinding machine, etc.,. all tools being used should be certified in house.

1. While one person is working inside outer person should always be there outside continuously to communicate and monitor from outer end..
2. The person working inside should wear Full Body harness (FBH) and one rope should be tied to FBH and the other end of rope should be tied outside of boiler.
3. Breathing apparatus should be kept with the person outside.
4. Special care should be taken care regarding COFG flue gas and check oxygen level inside the working areas by using multi gas detector/monitor before the person entering and starting his work. Also ensure that the inside temperature is within normal limit to carry on work.
5. Proper illumination to be ensured in and around the work area using lux meter.
6. Before starting of gas cutting or welding work bottom areas must be free from fire catching media or covered or clean area. Ideally bottom areas to be barricaded.
7. Fumes rising from confined space where there was no manholes, keep or arrange the opening from availed spaces or else provide exhaust fan for removal of fumes.
8. Before working at height put the safety net on bottom of surrounding working areas and if required additional platform modification required then get the clearance from design department as required.
9. Ground eyes to analyze and checking form 12 of lifting equipment and crane load chart, with respect to calibration details.
10. Additional safety to prevent fall from height while carry the work.

PRECHECKS

1. Take the work permit from MCD and GEL control room and lock with proper permit under shutdown check the co and oxygen level at work place.
2. Ensure that individual MCD stack top flap are open in condition and check the numbers of COFG oven in line/charged conditions and maintain the MCD oven draft as required.
3. Engineer PP should coordinate with MCD production head to stop charge of oven 48 hours prior to commencement of shutdown (12.10.14 at 00:00hours).
4. Before starting of cutting set and welding machine check the internal test certificate and machine healthiness.
5. Before starting of welding / gas cutting work check the any leakages, clean the working areas, make a proper arrangement or put some sheet for sitting.

PREPARATORY WORK.

1. Arrange the crane position for handling to lift the dismantled ducts and bellow with inside lining of refractory material.
2. Dismantling of MCD stack platforms at elevation of 35 mtr to 50 mtr for crane boom movements.
3. Installation of new platform at the bottom of GEL stack bellow for making safe working environmental..

SHUTDOWN ACTIVITY PROCEDURE

1. Before getting clearance from operation department shift the all required material like welding machine, gas cutter, grinding machine, chain block, scaffolding arrangement, electrical distribution board, required illuminations and other required all tools and inform to electrical department for proper checking , inspection and for connection for same.
2. Remove the GEL both stack top cover for entering fresh air for refractory, bricks cooling and provide hard barricade on top cover duct surrounding areas with proper name plate of restrictions.
3. Arrange the crane position for handling to lift the dismantled ducts and bellow with inside lining of refractory material.
4. Start the removal of fasteners between the MCD and GEL stack flange bolt and parallel start the cutting work for dismantling of damaged ducts.
5. Install 6 to 8 mm dummy on MCD stack flange for complete isolation of COFG heat from Oven.
6. Remove all the flange fasteners removed and completion of gas cutting work relocate all man power from surrounding area and given signal by one technical crane operating skilled person to the crane operator and lift the dismantled duct and shift the same as directed by site in charge.
7. Start cutting work for stack top cover plate and remove the top cover and lower it a ground level.
8. After completion of gas cutting work evacuate all man power from surrounding area and lift the dismantled duct and shift the same as directed by site in charge.
9. After shifting of damaged duct and before removing of duct internal bricks add four numbers of props inside of the duct properly.
10. After removal of damaged duct, start cleaning, grinding or waste loose refractory from the ducts.
11. Start the flange installation/align work and put the ceramic gasket rope between the flanges.
12. Start the lifting arrangement for newly fabricated M.S duct with inside refractory and as given direction by one technical crane operating skilled person.
13. Start the aligning work between M.S duct and flange and after completion of alignment start welding work.
14. After completion of welding work fill the air gap between the refractory by putting Mortar refractory.
15. Lift the top cover plate place in position and work.
16. After completion of welding work start the removal of scaffolding, safety net and any other support platform which was arranged in the earlier.
17. Remove all the generated scrap material and shift in to the scrap yard as directed by site in charge.
18. Remove the all machines/ tools / waste and shifted to proper designated areas.

Close all the boiler manholes & cancel the work permit.