**ACTIVITY : REPLACEMENT OF WATER SEAL IN BFG LINE**

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* Objective : - Safe erection and dismantling of Water Seal
* Scope : - Blast furnace gas line and water seal.
* Ref. : - WI/MAINT/15, SP44, SP46
* Responsibility : - Engineer In Charge & workmen at job

PPE –s to be used:

* Helmet, Safety shoes, Safety harness Dust masks, Hand gloves and goggles.

**Hazards identified**

**Mechanical Hazard** –

Fall of person from height

Fall of material

Failure of sling, D shackle, Hydra

Trapping between structures & lifted load

Fall of tools, tackles, wedges

Slipping of wedges while hammering

Failure of scaffolding

**Chemical hazard** - CO gas poisoning,

**Physical hazard** - Fire,

**Aspect and Impact of the activity:**

Scrap generation: Resource Depletion

Fire: Air pollution

**PROCEDURE**

1. Scaffolding with platform & hand railing has to be prepared prior to work. It should be inspected by an engineer for stability and proper approach. This platform is required for alignment of the duct joint, cutting and welding of the duct joints
2. Job to be planned during 8 hours of blast furnace planned down.
3. Take work permit
4. Remove the dummies of the nearby drip pots in the in BFG line and open all the inspection doors in the gas line if any.
5. Water seal the gas line and steam purge the gas line keeping all the vents open.
6. Cordon the area with the work in progress tape.
7. Explain the job to the Mobile Crane operator before starting the work
8. During the work, CO level has to be monitored continuously.
9. All workmen should wear necessary PPE’s
10. Use a securely tied Ladder reach the platform structure.
11. Ensure that the Oxygen and LPG cylinders are covered with wet gunny bags and properly secured on stand
12. Take precautions to avoid falling of material from heights
13. Securely hold the water seal with the help of mobile crane. Use tested tool, slings, D-shackles & crane
14. The weight of 2 way water seal is 2T and 3 way water seal is 3.3 T. Use appropriate sling and D shackles.
15. Dismantle the top platforms of the water seal and lower it to ground.
16. Gas cut the inlet and outlet ducts of the water seal.
17. Sling the water seal properly with slings and D shackles
18. Take the load of the water seal on the crane and start cutting the saddle supports of the water seal.
19. Once all supports are cut, lift the water seal and place on ground. Only trained rigger should give instructions to crane operator.
20. Cut the edges of the inlet and outlet duct properly in order to ensure proper alignment of duct joints.
21. Lift new water seal and align it with the ducts by inserting wedges if necessary.
22. Weld the joints.
23. Simultaneously, provide saddles for the water seal to ensure that it is placed properly on the supporting structure.
24. Weld the second joint of the ducts with the water seal and the supporting saddles after that
25. Erect the water seal platforms back.
26. Connect the steam, overflow and water lines of the drip pot.
27. Check leakage in joints after connecting all lines by filling water & by pressurizing with steam. Ensure that relief valves are kept open after the testing is done or else steam condensation can take place inside the duct which will create vacuum leading to imploding of duct.
28. Purge the line with steam with production department personnel.
29. Remove all the temporary scaffolding and clean up the area.
30. Clear work permit and give clearance to production

DO’s

* During the work, CO level has to be monitored continuously.
* Cordon the area with the work in progress tape.
* Explain the job to the mobile Crane operator before starting the work
* Inspect the slings and other handling items before use

DO NOT

* Keep the relief valves closed after testing of gas line for leakage testing.

**Amendement Record**

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| **Date** | **Manual Section Ref. & Para** | **Brief details of Revision** | | | **New Rev.** | |
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| **Prepared By:**  Area Engineer | | | **Reviewed & Issued By:**  Management Representative | **Approved By:**  Mechanical Head | |
| **Signature** | | | **Signature:** | **Signature:** | |
| **Review Date: 12.12.22** | | | **Review Date: 12.12.22** | **Review Date: 12.12.22** | |