**WORK INSTRUCTION FOR MAINTENANCE OF FURNACE REFRACTORY BRICKS POSITIONING**

1.0 PURPOSE

Safe Maintenance of furnace refractory bricks positioning for optimum performance.

2.0 SCOPE

Sinter Plant

This procedure applies to furnace refractory bricks positioning VL/IMS/SP/MECH/WI/16

3.0 RESPONSIBILITIES

Area Engineer / Shift Engineer

Workmen on the job

4.0 PROCESS DESCRIPTION

Maintenance of Furnace refractory bricks positioning

**Do’s:**

* Use Co monitor to check the concentration of gas
* Ensure the workers are using hand gloves
* If required move the machine forward to reduce the heat in the working vicinity.

**Don’ts:**

* DO not start the work immediately after stopping the furnace. Equipment’s will be at high temperature.

|  |  |  |
| --- | --- | --- |
| **ENERGY SOURCE** | **HAZARDS PRESENT** | **ISOLATION** |
| **Electrical** | YES | Sinter Machine/BFG valve |
| **Mechanical/Kinetic** | Yes | Mechanical Valve |
| **Hydraulic** | NO | NO |
| **Pneumatic** | NO | NO |
| **Steam** | NO | NO |
| **Chemical** | NO | NO |
| **Thermal** | Yes | High temperature |
| **Radiation** | NO | NO |
| **Poor Illumination** | NO | No |

**PPE’s & OTHER SAFETY EQUIPMENT REQUIRED:**

* Reflective Jacket
* Hand Gloves
* Safety Helmet
* Safety Shoes
* Safety Goggles
* Heat Resistant Jackets
* **PPEs to be used: -** Helmet, Safety shoes, hand gloves, Dust mask and safety goggle
* **Activity No 1**:-Furnace refractory bricks positioning.
* **Activity No 2**:- Furnace refractory Block replacement**.**

.

**Hazards Identified:**

**Mechanical hazard**

1. Inhaling of dust.
2. Fall of material.
3. Fire/Heat hazard.
4. Failure of sling, chain pulley block, improper hooks welding.
5. Fall of a person.
6. Presence of CO
7. Dust infection to Eyes

**Electrical hazard**

1. Electrical shock in welding

**Activity No 1:-FURNACE REFRACTORY BRICKS POSITIONING**

**Work Instruction**

Inform the person in control room and ensure that all the valves (shut off valve, Goggle valve) in BFG line are closed and LOTO on goggle valves near Sinter Plant and water seal near PCI .**Refer working on BFG line in SP (**WI/SP/MAINT/14)

1. Take electrical shut down of sinter machine.
2. Take shutdown electrical/mechanical isolation of valves that are closed.
3. If more than one worker is relying on the protection of an isolation, then all workers should apply their own locks in master lock out box
4. Press local push emergency button of the Sinter machine.
5. Check CO concentration in working area.
6. If the bricks have come down from its position tighten the anchor bolts which are projected in the furnace platform to bring back the bricks to its position
7. If sufficient gap is not available between the bricks & pellet car after full tightening of bolts then remove the top side wall of the pellet just below the bricks
8. Use hydraulic jack for lifting the brick. Ensure the jack is certified by concerned authorities before using it
9. Once the brick is lifted providing sufficient gap (25 mm) tighten the anchor bolts
10. Release the jack.
11. Fix the top side wall of pellet car and tighten all four bolts of size 20mm. Spanner used {ring spanner , D-spanner & hammering spanner (30)}
12. Ensure all tools have been cleared from the vicinity.
13. Clear all electrical shutdown/mechanical isolation of the valves that are closed & inform to production.

**Activity No 2  :**  Furnace refractory Block replacement.

1. Take electrical shut down of sinter machine.
2. Take shutdown electrical/mechanical isolation of valves that are closed.
3. If more than one worker is relying on the protection of an isolation, then all workers should apply their own locks in master lock out box
4. Press local push emergency button of the Sinter machine.
5. Check CO concentration in working area.
6. Remove the cover plate of furnace by using EOT Crane.
7. Loosen the j-hook bolts.
8. Cut the hooks of blocks and remove it.
9. If sufficient gap is not available between the bricks & pellet car after full tightening of bolts then remove the top side wall of the pellet just below the bricks
10. Use hydraulic jack for lifting the brick. Ensure the jack is certified by concerned authorities before using it
11. Once the brick is lifted providing sufficient gap (25 mm) tighten the anchor bolts
12. Release the jack.
13. Ensure all tools have been cleared from the vicinity.
14. Clear all electrical shutdown/mechanical isolation of the valves that are closed & inform to production.

**Amendement Record**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Manual Section Ref. & Para** | **Brief details of Revision** | **New Rev.** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
| Prepared By:  Ass. Manager – Sinter Plant | Reviewed & Issued By:  Management Representative | Approved By:  Head Sinter Plant |
| Signature: | Signature: | Signature: |
| Review Date: 14.10.2022 | Review Date: 14.10.2022 | Review Date: 14.10.2022 |