**SOP FOR**

1. **PURPOSE: Safe maintenance of auto stock rod**
2. **SCOPE:** Blast Furnace Accessories
3. **RESPONSIBILITY: Engineer in charge**
4. **PROCEDURE: maintenance of Auto Stock rod**

**LIST OF TASKS COVERED**

1. Work No 1: Stock rod heavy bob replacement
2. Work No.2: Stock rod wire rope/chain changing
3. Work No 3: Stock rod coupling bush replacement.
4. Work No 4: Stock rod gear box replacement.

PPE –s to be used :

* Helmet, Safety shoes, hand gloves, dust mask, Co monitor, and safety goggle

Aspect –impact :

|  |  |
| --- | --- |
| Scrap generation | Resource Depletion |
| Oil Spillage | Land contamination |
| Oil traced waste generation | Land contamination & Resource Depletion |
| Dust Generation | Air pollution |
| Fumes | Health |
| Fire | Air pollution SP 42 |

Hazards identified

Physical Hazard - Pressure, temperature

Mechanical Hazard - Trapping between two objects,

Fall of material, hammer, tools, slinged items, bolts,

wedges, stock rod, pulley

Fall of person from platform,

Entanglement

Impact of moving / slinged items

Chemical hazard - Gas poisoning, Fire

Electrical hazard - Electrical shock

Behavioral Hazards: working without all required PPE’s

Working under influence of alcohol

Horse play, Casual approach

Not following SOP/WI while carrying out the job

###### Work No 1A: Stock rod Dead weight 100 kg replacement

1. Take clearance from production department for changing the stock rod Dead weight by taking work permit. **This activity is to be carried out in shutdown of blast furnace**.
2. Ensure that top hatch & bleeder in open condition.
3. Carry the CO monitor & CO should be zero.
4. Open the inspection door of Auto stock rod.
5. In coordination with instrumentation dept. & Process dept. slowly hoist the heavy bob Dead weight till it reaches the inspection door. (Lock the Drum shaft by stich welding by keeping any bolt or rod).by which instrument limit will not get disturb.

**Note**: Alternatively you can manually rotate the extended shaft of the motor by fitting the hand wheel & hoist the Dead weight by slightly loosening the brakes.

1. Take electrical shutdown of the equipment.
2. Now tie a manila rope to the Dead weight, and try to pull it out of the inspection door to the nearest platform.
3. Replace the Dead weight with suitable Dead weight . Replace the D- shackle if needed.
4. Manually rotate the extended shaft of motor in order to hoist the Dead weight till it is inserted into the stock rod housing.
5. Now in co-ordination with instrumentation & process dept. slowly lower the Dead weight Till it reaches at rest position.

**Note**:

**Rest position**: From the inspection door bottom edge to the lowest point of Dead weight is 2.5 mtr.

1. Take trial of stock rod 2-3 times, after clearing electrical shutdown.
2. Close the Inspection door; replace the asbestos rope if needed.
3. Clear Work permit.

Work No.2: Stock rod wire rope/chain replacement.

1. Take clearance from production department for changing the stock wire rope / chain replacement by taking work permit. **This activity is to be carried out in shutdown of blast furnace.**
2. Ensure that top hatch & bleeder in open condition.
3. Carry the CO monitor & CO should be zero.
4. Follow steps 2 to 10 of above procedure (Work No 1A) for replacing wire rope & chain.

**Note**: **10mm wire rope** = 18 meters long.

**Chain length =** 7 meters.

Work No 3: Stock rod coupling bush replacement/De couple trials

1. Take clearance from production department for changing the coupling bush or for de couple trials by taking work permit of the stock rod whose coupling bush needs to be replaced.
2. Inform Instrumentation to park the Dead weight at Maintenance position.
3. Inform Instrumentation dept. , as settings will get disturbed while de coupling.
4. Take electrical shutdown of the equipment .
5. Close the furnace isolation valve.
6. De-couple the motor and gear box by removing the Teflon bushes one at a time.
7. Carry out the de- couple trials of motors after temporary clearing the shutdown.
8. Once de-couple trial are finished, take clearance for coupling from electrical /Instrumentation.
9. Check Teflon bushes for any damage, if found damaged same needs to be replaced.
10. Open the furnace isolation valve.
11. Clear electrical shutdown & take trial 2-3 times
12. Clear the work permit & give clearance to Operation dept.

Work No 4: Stock rod gear box changing.

1. Take clearance from production department for changing the gear box.
2. Take electrical shutdown of the equipment & take the workpermit.
3. Follow steps 2 to 11 of work no#3.

DO:

1. Ensure top firing is carried out incase stock rod inspection door needs to be opened.
2. Ensure release of tension of wire rope before working on wire rope.

**Do Not**:

1. Work at furnace top without any CO monitors.
2. Carry out activity like chain / Dead weight replacement in running furnace by isolating the furnace isolation ball valve.

**Amendement Record**

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| **Date** | **Manual Section Ref. & Para** | **Brief details of Revision** | **New Rev.** |
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| **Prepared By:**  Digital head VAB | **Reviewed & Issued By:**  Management Representative | **Approved By:**  Mechanical and Asset Integrity Head VAB |
| **Signature:** | **Signature:** | **Signature:** |
| **Review Date: 15.07.2023** | **Review Date:15.07.2023** | **Review Date: 15.07.2023** |