**SOP FOR**

1. **PURPOSE: Safe maintenance of hoist for optimum performance.**
2. **SCOPE:** **Blast Furnace Accessories .**
3. **RESPONSIBILITY: Engineer in charge & workmen on job .**
4. **PROCEDURE: HOIST MAINTENANCE .**

PPE –s to be used:

* Safety shoes, Helmet, Hand gloves, Cotton cloth and goggle
* Mandatory safety PPE for Hot Blast valve changing : Face shield, leather jacket in addition to above mentioned safety PPE’s to avoid contact with hot water/steam during cooling water hose replacement

**LIST OF TASKS COVERED**

Work No 1 - Cross Travel Gear box / motor replacement

Work no 2 - Wire rope changing

Work no 3 - Hoist replacement.

Work no 4 - Lubrication of wire rope.

Aspect – Impact

|  |  |
| --- | --- |
| Scrap generation | Resource Depletion |
| Oil Spillage | Land contamination & Resource Depletion |
| Oil traced waste generation | Land contamination & Resource Depletion |
| Fumes | Health |

[Hazards identified](file:///C:/Users/Vaaman%201/AppData/Local/Microsoft/Windows/INetCache/00015236/AppData/Local/Temp/Temp5_11%20%20Work%20instruction.zip/4%20RISK%20ASSESMENT/WIMAINT40%20PUG%20MILL%20MAINTENANCE.xls)

Mechanical Hazard - Trapping in between slinged items,

Trapping between the moving parts like gear & wheels

Trapping of the hand below motor while changing

Impact of hammer, slinged items, tools & tackles.

Falling of weights, hammer, slinged items, bolts, etc.

Cut on hand due to wire rope

Slip of the wheel from height

Failure of lifting tools and tackles

Electrical Hazard - Electrical shock due to faulty line.

Physical Hazard - Temperature

Human Behaviour Workmen under influence of alcohol

Violation of procedure

Not wearing PPE’s

Not concentrating while working

Horseplay

Violation of Covid 19 Pandemic protocol

1. **For PCM Skull 5 ton & Mould handling 3 ton hoist**

**Work No 1 - Cross Travel Gear box / Motor replacement**

1. Take electrical shutdown after parking the hoist in the working platform & Take work permit from Production department for working on the hoist.
2. Remove the flange bolts (Foundation bolt) of gearbox and motor and replace the motor/ gearbox.
3. Align the new gear box/motor on the flange joint and fit the spare gearbox/ motor using flange bolt.
4. Tighten the flange bolts as per the stated torque by manufacture.
5. Check the lubricant( oil mixed grease) level of the gear box as per the requirement
6. Clear the electrical shutdown and take trial.
7. Clear the workpermit
8. Hand over the crane to production dept.

**Work no 2**- **Wire rope changing**

**+**

1. Park the hoist towards the working platform.
2. Take electrical shutdown & Work Permit after parking the hoist on the working platform & Erect Scaffolding for loosening the clamp bolts of opposite end & temporary shut down to be clear for wire rope replacement.
3. Lower the entire wire rope using hoist.
4. Loosen the clamping bolts of wire rope on drum with close co ordination with operator. And remove the old rope and roll it and keep it at safer place.
5. Ensure that the new rope is as per required dia. that is 12mm/14mm/16mm and correct length.
6. Clamp one end of the rope on to the drum . Ensure that minimum 3 clamps are available for rope clamping .
7. Ensure proper tightness of clamping bolts.
8. Slowly start hoisting the rope by operating the hoist and ensure that there is no overlapping of rope taking place on drum. Hoist the rope until 50 % of drum is covered with rope
9. Now pass the other end of the rope through the hook pulley & gravity switch & clamp it to the fixed end after passing over the standard wedge using 3 bull dog clamps.
10. Now re start the hoisting operation until gravity limit switch gets activated .
11. After normalcy of the equipment with load/no load trial shutdown to be cleared.
12. Clear work permit and hand over the crane to production dept.

**Work no 3**-**Hoist Replacement.**

1. Move the hoist towards the beam end .
2. Take electrical shutdown for replacement of hoist.
3. Take the work permit from Production department.
4. Remove electrical connection from the hoist .
5. Remove the beam end stopper.
6. Use 5 ton belt sling to wrap around the hoist and take the load on F-15 crane /TMC .
7. Slowly slide the hoist out from the beam & lower on the ground.
8. Follow procedure WI/MAINT/12 and SP44 for material handling using F-15 crane.
9. Raise the new hoist assembly, position the same on beam and fix the end stoppers.
10. Slowly lower the load from F-15 crane / TMC.
11. Make electrical connetion & Clear electrical shut down and take trial .
12. Carry out load test of the hoist by lifting 6 Ton load for 5 ton hoist & 4 ton load for 3 ton mould replacement hoist .
13. Clear work permits and hand it over to production.

**Work no 4 Lubrication of wire rope**

1. Take the clearance from production dept lower the wire rope .
2. LOTO required
3. Apply sufficient quantity of Rope Lube 1000 on the wire rope using brush
4. Give the clearance to the production.

**Note**: Carry out the house keeping activity as per work procedure ~~WI/MAINT/94~~

For lubrication follow work procedure WI/MAINT/93.

1. **For Complex water pump house hoist**

**Work No 1 - Cross Travel Gear box / motor replacement**

1. Take electrical shutdown of the crane after parking the hoist on the working platform.
2. Take work permit from Production department for working on hoist
3. Inform the Pump house operator.
4. ~~Park the 5 ton hoist towards the working platform .~~
5. Remove the flange bolts (Foundation bolt) of gearbox and motor and replace the motor/ gearbox.
6. Align the new gear box/motor on the flange joint and fit the spare gearbox/ motor using flange bolt.
7. Tighten the flange bolts as per the stated torque by manufacture.
8. Check the oil level of the gear box as per the requirement
9. Clear the electrical shutdown and take trial.
10. Hand over the crane to production dept.

**Work no 2**  - **Wire rope changing**

1. Park the hoist towards the working platform.
2. Take electrical shutdown & Work Permit after parking the hoist on the working platform & Erect Scaffolding for loosening the clamp bolts of opposite end & temporary shut down to be clear for wire rope replacement.
3. Take work permit from Production department for working on hoist
4. Park the 5 ton hoist towards the working platform.
5. Inform the pump house operator.
6. Lower the entire wire rope using hoist.
7. Loosen the clamping bolts of wire rope on drum. And remove the old rope and roll it and keep it at safer place.
8. Ensure that the new rope is of 12,14,16 mm dia.
9. Clamp one end of the rope on to the drum . Ensure that minimum 3 clamps are available for rope clamping .
10. Ensure proper tightness of clamping bolts.
11. Slowly start hoisting the rope by operating the hoist and ensure that there is no overlapping of rope taking place on drum. Hoist the rope until 50 % of drum is covered with rope
12. Now pass the other end of the rope through the hook pulley & clamp it to the fixed end after passing over the standard wedge using 3 bull dog clamps.
13. Request electrical to take gravity switch in line .
14. Now re start the hoisting operation until gravity limit switch gets activated .
15. ~~Carry out load test of the hoist by lifting 6 Ton load for 5 ton hoist~~ Take trial in no load & load .
16. Clear work permit and hand over the crane to production dept.

**Work no 3**  - **Hoist Replacement.**

1. Take work permit from Production department for working on hoist.
2. Inform Pump house operator.
3. Park the crane towards the working platform.
4. Take electrical shutdown for replacement of hoist.
5. Tie chain block to the crane girder & dismantle the hoist by dismantling the hoist wheels.
6. Lower the hoist on platform.
7. Follow procedure WI/MAINT/12 and SP44 for material handling using hydra.
8. Lift the new hoist & place in position,. Adjust the crane wheel distance as per the beam size.
9. Request electrical to carry out connection of hoist.
10. Clear electrical shutdown and take trial in no load & load and hand over the crane to production dept..
11. .~~Carry our load test of this hoist~~

**Work no 4**  - **Lubrication of the wire rope**

1. Take the clearance from Pump house operator lower the wire rope down .
2. Use wire rope dressing compound ROCOL or cardium compound for lubricating rope.
3. Apply sufficient quantity of Rocol / cardium compound on to the wire rope using brush
4. Give the clearance to the pump house operator.

**Note**: Carry out the house keeping activity as per work procedure WI/MAINT/91

For lubrication follow work procedure WI/MAINT/93.

**DO’s**

* Ensure to check the length of wire rope and condition of wire rope before job is initiated .
* Ensure that only steel core wire rope is used.
* Ensure to load test the hoist once hoist replacement activity is completed.
* Ensure to fix the end stoppers before taking trial of hoist .
* Ensure that after any change done the hoist , again load test to be done & fresh load testing certificate to be availed from the competent person.

**DONT’s**

* Stand below the suspended load.

**REFERENCES: Operation & Maintenance manual.**

**Amendement Record**

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

|  |  |  |
| --- | --- | --- |
| **Prepared By:**  Area Engineer | **Reviewed & Issued By:**  Management Representative | **Approved By:**  Mechanical Head |
| **Signature:** | **Signature:** | **Signature:** |
| **Review Date: 15.10.2022** | **Review Date: 15.10.2022** | **Review Date: 15.10.2022** |