**SOP FOR**

**1.0 Purpose : -** Safe Maintenance of Vibration screens & feeders for Optimum performance.

2.0 **Scope**: Sinter plant.

3.0 **Responsibility : -** Engineer In charge and workmen on the job

4.0 **Procedure** : **MAINTENANCE OF VIBRATING SCREEEN & FEEDERS (FLUX & FUEL)**

**PPEs to be used :**

      Helmet, Safety shoes, hand gloves, Dust mask, ear plug, safety goggle and safety belt.

Work No 1  :  Replacement of Unbalance Motors in Vibro-feeder (VF)/Vibrating screen (VS)

Work No 2 : Adjustment of counter weight in unbalance motor

Work No 3  :  Replacement of Spring / turn buckle

Work No 4  :  Replacement of Liners of flux screen and chutes.

Work No5 : Replacement of mesh of flux screen

Aspect - impact

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| --- | --- |
| Scrap generation | Resource Depletion |
| Dust Generation | Air pollution |

Hazards identified -

Mechanical hazard

1.      Trapping between motor and structure

2.      Entanglement between springs.

3.      Impact of counter weight

4.      Accident due to improper shutdown

5.      Injury form cloth ends

6.      Flying of circlip

7.      Failure of sling, chain pulley block, improper hook welding

8.      Fall of material.

9.      Fall of a person.

Electrical hazard

1. Electrical shock in welding

**Procedure -**

1. **Work No 1 : Replacement of Unbalance Motors in Vibro-feeder (VF)/Vibrating screen (**Take clearance from operation department and obtainthe shutdown from Electrical Department. Disconnect the cable of the motor – Responsibility Electrical.
2. All workers should apply their own locks in master lock out box.
3. Remove safety sling.
4. Tie the motor with manila rope of 25 mm size (2 nos) for VF’s and chain pulley block for VS’s. Check condition of manila rope before carrying out the activity.
5. Remove the foundation bolts of the motor and lower the motor slowly by slipping the manila rope/chain block.
6. Inspect the foundation for any cracks.
7. Check the foundation hole dimensions with the new motor base bolt holes. Make necessary modifications if any difference in dimension is found.
8. Similarly lift the new /overhauled motor to the position using rope/chain block.
9. Fix foundation bolts. Use HT bolts (10.9/8.8 grade) for bolting with torque wrench as given in the below chart
10. Use 3 mm thick plate washer, spring washer and nyloc nut. Apply thread locking compound.
11. Remove the counter weight covers of both motors and set the counter weights equally. Fit back the motor after adjustments.
12. Clamp safety sling with bulldog clamp (4 nos) to motor to avoid fall.
13. Clear electrical shut down.
14. Open the cover of motor and take the direction trial of both motors in inching after taking trial fix the motor cover (one motor clockwise & other motor anticlockwise) and check for suitable vibration and any abnormalities.
15. Check the motor current on no load and load – Responsibility - Electrical.
16. Hand over the equipment to Production dept.
17. Monitor the operation for 24 hrs once in a shift) for looseness in bolt , temperature of bolt and current of motor

Additional precautions to be taken while mounting of Unbalanced Motors

1)      Clean the motor foundation and the mounting frame from dust/ rust.

2)   The counterweight setting of the motor is to be adjusted as per the motor that is already fitted to other side. All the bolts of rotating eccentric weights should be checked for its tightness before switching on the motor

3)   Eccentricity on both sides of rotor shaft should always be same for both motors. Any mistake in setting of counterweights will lead to crack on foundation frame, high current in motor and subsequent tripping on overload,

4)   After approx. 2 hours of operation, mounting bolt/nut should be rechecked to ensure that they are not loosening. Failure to observe this instruction will damage the motor feet/ bolt.

While commissioning new unbalance motor care should be taken to set counterweights at less eccentricity & then gradually increase the eccentricity in 3 to 4 steps.

**Work No 2 : Adjustment of counter weight in unbalance motor**

1. Take clearance from operation department and obtainthe shutdown clearance from Electrical Department. Remove the counterweight covers of both motors – Responsibility Electrical.
2. All workers should apply their own locks in master lock out box.
3. Set the counter weights equally. Eccentricity on both sides of rotor shaft should always be same for both motors.
4. Clear shut down.
5. Open the cover of motor and take the direction trial of both motors in inching after taking trial fix the motor cver (one motor clockwise & other motor anticlockwise) and check for suitable vibration and any abnormalities.
6. Check the motor current on no load and load.
7. Hand over the equipment to Production dept.

**Work No 3 : Replacement of Spring / turn buckle**

1. Take clearance from production department and obtain the shutdown clearance from Electrical Department.
2. All workers should apply their own locks in master lock out box.
3. Hook Feeder tray with certified chain block.
4. Lift feeder tray & release the load on Spring/turn buckle.
5. Replace Spring /turn buckle which ever required.
6. Release chain block load &remove the chain block.
7. Check position of feeder tray & adjust turn buckle as required.
8. Check safety sling of motor.
9. Clear electrical shut down. Take the trial of feeder and check for suitable vibration and any abnormalities.
10. Check the motor current on no load and load.
11. Hand over the equipment to Production dept and check the feeder flow with operation dept.

**Work No 4  :  Replacement of Liners of vibrating screen and chutes.**

1. Take clearance from production department and obtain the shutdown clearance from Electrical Department, hammer crusher, Vibrating screen and its conveyor RJ2A/RJ2B.
2. All workers should apply their own locks in master lock out box.
3. Open the screen top cover bolts and open the cover.
4. Cut the grizzly and fix it properly with support/remove outside.
5. Loosen the bolts of liner plate and removed it.
6. Fix the new liner and bolted it properly if require stich weld the liners.
7. Fix the grizzly by welding and cover the hood plate.
8. Remove the unwanted material from side.

Release the electrical shut down and take trial and check for any abnormalities.

9.Handover the equipment to Production dept.

Work No5 : Replacement of mesh of flux screen

1. Take clearance from production department and obtain the shutdown clearance from Electrical department. Including of Hammer crusher, vibrofeeders and vibrating screens.
2. Open the screen top cover bolts and open the cover.
3. Open the screen side clamping bolts and remove the clamp.
4. Remove the old screen mesh outside.
5. Position the new screen mesh.
6. Put the screen side clamp and bolt it.
7. Put the screen top cover and bolt it.
8. Release the electrical shut down and take trial and check for any abnormalities
9. Check the motor current on load and no load.
10. Handover the equipment to Production dept and check the feeder flow with operation dept.

**Amendement Record**

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| **Date** | **Manual Section Ref. & Para** | **Brief details of Revision** | **New Rev.** |
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**Reference: - SP-44**

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| **Prepared By:**  Associate Manager- Sinter Plant Mechanical | **Reviewed & Issued By:**  Management Representative | **Approved By:**  **Manager- Mechanical PID2** |
| **Signature:** | **Signature:** | **Signature:** |
| **Review Date: 29.06.2022** | **Review Date:** | **Review Date:** |