1.0 Purpose: Maintenance of Main flue duct

2.0 Scope: Sinter Plant

3.0 Responsibility: Engineer In charge and workmen on the job

4.0 **Procedure**: **MAINTENANCE OF MAIN FLUE DUCT**

* PPE’s to be used: Helmet, Safety shoes, hand gloves, Dust mask and safety goggle.

## Activity No 1: Patching of punctures and walkway strengthening from inside the duct.

* Activity No 2: Repair of castable anchors inside the duct connecting sinter machine and HESP.
* Aspect – impact:

Dust Generation Resource Depletion

Scrap Generation Air pollution, Resource Depletion

**Identified Hazards:**

|  |  |  |
| --- | --- | --- |
| **Energy Sources** | **Potential hazards** | **Consequences** |
| Electrical | * Electrical & Instrumentation cables | * Burn injuries * Electrical shock in welding |
| Kinetic | * Rotting Impeller | * Exposure to wind * Exposure to excessive noise |
| Mechanical | * Rotting Impeller * In haling of dust * Failure of sling, chain pulley block * Fall of people * Fall of material | * Exposure to wind * Exposure to excessive noise * Fractures |
| Potential | * Water on the floor * All steady structures * Electrical & Instrumentation cables | * Slip & trip while walking * Trip & fall over cables Or water line laid on floor * Electrocution |
| Thermal | * Heat from the main duct | * Burn Injuries |
| Chemical | * Lubricants * Water * Co gas | * Slip & fall * Water borne disease * Suffocation |
| Radiation | * NA |  |
| Biological | * Mosquitoes * Birds | * Birds attack * Mosquito bites |
| Bio mechanical | * Body posture of operator entering the duct. | * Body Pains * Fractures * Disabilities |

**FOR MORE DETAILS REFER CENTRALISED CONFINED SPACE ENTRY SOP-VL/IMS/VAB/SP44 Y**

**Human Hazards:**

1. Non adherence to WI
2. Nonuse of PPE

**DO’S**

1. Dust generation.
2. Inside heat of duct.
3. Use PPE’s.
4. Follow SOP.
5. Activity to be carried out during day duty hours.
6. New work permit to be taken after every 8 hrs.
7. For working in night prior approval should be taken from Head Operations
8. Unauthorized operation or repair of any equipment is a punishable offence.
9. Before putting Entrant (Fitter/welder/Rigger) on job attendant must ensure that Entrant (Fitter/welder/Rigger) should familiar with the operation.
10. Before entering into duct ensure that shutdown of Main Fan is taken.
11. Before entering into duct ensure about non availability of CO presence.
12. Check the grizzly platform condition (made of rods) for its looseness, to avoid falling of person.

**DONT’S**

1. Do not by pass SOP.
2. Don’t enter in duct in presence of CO.
3. Don’t enter in duct if temp is high.

**Activity No 1:  Patching of punctures and walkway strengthening from inside the duct.**

1. Before Entering in Main flue duct ensure –
2. Take electrical shutdown of Main fan and sinter machine.
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. Main Duct inside temperature should be less than 45 degrees Celsius.
6. CO Level should be 0 ppm
7. Attendant must ensure proper illumination, if illumination not found ok, he must inform concern electrical person to provide hand lamp/Torch (24v).
8. Take the work permit from HOD, Safety for entering inside main duct.
9. The workmen (Entrant) who is trained and certified by SUB head and having valid confined space gate pass should perform the activity and he can be replaced (in emergency) only by certified entrant.
10. A standby (attendant) who is trained and certified by SUB head and having valid confined space gate pass should perform the activity and he can be replaced (in emergency) only by certified attendant.
11. Standby person who shall be positioned outside the confined space, must have no other duties other than monitoring people and conditions inside the confined space and coordinating with rescue personnel (he must have contact number of rescue team members) if required.
12. Standby (Attendant) person has to log down the entry details of all Entrants.
13. Check of Internal atmosphere of the space for sufficient oxygen content (19.5% to 23 %) flammable gases and vapors, and the potential for toxic air contaminants before entering into main flue duct. If there is any deviation, please do not enter into main flue duct.
14. Check for the presence of Chemical asphyxiates such as Carbon monoxide (CO gas detector). It should be 0 PPM
15. Check inside temperature and it should be is in the tolerable range (25 deg C to 45 Deg C). If the temperature is not within limits, then appropriate ventilation to be used.
16. Check for suitability of equipment that is used at the confined space.
17. Check any dust due to which visibility is reduced or respiratory tract is irritated.
18. The sign-in and sign-out of all persons entering into main duct should be recorded.
19. Use 24V DC supply illumination to avoid electrocution/electric shock.
20. Ensure that main fan damper is in open condition for natural draft during inspection.
21. If everything is OK, enter into main duct and start Inspection of platform and duct puncture.
22. Check the condition of the walkway. If it is weak than reinforce with round bars (20 to 30mm dia) by proper welding.
23. Check the duct body. If any punctures are visible then patch the same by welding.
24. Ensure that proper housekeeping is done inside the duct and close the manhole.
25. Normalize the system and release all equipment shutdowns and close the work permit.
26. Give the clearance to HOD, SS from your side that your assigned job is completed.

**Activity No 2:** **Repair of castable anchors inside the duct connecting sinter machine and HESP.**

1. Follow the confined space procedure as shown in above work no1.
2. Before starting job ensure only certified welding machine and gas cut to be used
3. Checks the anchor condition if it is damage replace it with new one.
4. Apply the castable: Responsibility-Production.
5. Ensure that proper housekeeping is done inside the duct and close the manhole.
6. Normalize the system and release all equipment shutdowns and close the work permit.
7. Give the clearance to HOD, SS from your side that your assigned job is completed.

Please note that this area is considered as Confined Space so needs to maintain the checklist of the activity. All in time and out time details of entrants, levels of gases to be logged in checklist (yellow copy) or in any alternate document and to be documented.

**Role of Rescue Team**

**As the work is being carried out inside main duct, in an emergency victim can be taken out by use of rescue apparatus such as stretcher. However, attendant should call ambulance which is fully equipped. However, rescue team members should take a charge of the situation.**

**Ref. : -** SP-44, VAB/PIEP/43Y

**Amendement Record**

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| **Date** | **Manual Section Ref. & Para** | **Brief details of Revision** | **New Rev.** |
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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: 20.03.2023** | **Review Date: 20.03.2023** | **Review Date: 20.03.2023** |