**WORK INSTRUCTIONS FOR CLEANING GCS DRAIN TUNNEL OF BF-1 & BF-2**

**Criteria:** To avoid water accumulation/ clear silted material

**Responsibility:** Bag House Incharge/ concerned staff/ Officer Incharge

**Identified Hazard:**

**1.** Fall of person

2. Contact with lime

3. Contact with hot water.

4. Sudden water from cooling tower due to power failure.

5. Suffocation due to less O2

6. Heat.

7. Vehicle/crane movement

8. BFG poisoning

9. Skin irritation in tunnel.

10. Not Using PPE

11. Improper house keeping

12. Inadequate local lighting

**Significant Aspect:**

**1.** Water accumulation

**2.** Slurry generation

**Procedure**:

**This is a confined space; refer SP 44Y for requirement and detailed guidelines for working.**

**Please follow the following procedure**

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

Confined Space Checks before job start up:

1. Before Entering in Confined Space ensure –
2. Inside temperature should be less than 40°C.
3. CO Level should be 0 ppm
4. Attendant must ensure proper illumination, if illumination not found ok, he must inform concern electrical person to provide hand lamp or halogen.
5. Take the work permit from production-in-charge, Safety, electrical, mechanical for entering Confined Space.
6. The workmen (Entrant) who is trained and certified by SBU Head and having valid confined space gate pass should perform the activity and he can be replaced (in emergency) only by certified entrant .
7. A standby (attendant) who is trained and certified by SBU Head and having valid confined space gate pass should perform the activity and he can be replaced (in emergency) only by certified attendant.
8. 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.
9. Standby (Attendant) person has to log down the In/Out entry of all entrants and ensure that entrant should be come out after 30 minutes from confined space for normal jobs.
10. In some cases, In/Out time may be relaxed /extended based on the risk involved in the particular confined space.
11. Check Internal atmosphere of the space for sufficient oxygen content (19.5% to 23.5 %) flammable gases and vapours, and the potential for toxic air contaminants by the use of multi gas detector, if required use pump with extension before entering. If there is any deviation, do not enter into confined space.
12. Check for the presence of Chemical asphyxiates such as Carbon monoxide (CO gas detector). It should be 0 PPM
13. Check inside temperature and it should be is in the tolerable range (25°C to 40°C). If the temperature is not within limits, then appropriate ventilation to be used to normalize the temp.
14. Check for suitability of equipment that is used at the confined space.
15. Check any dust due to which visibility is reduced or respiratory tract is irritated.
16. The sign-in and sign-out of all persons entering into confined Space should be recorded.
17. Use 24V DC supply illumination to avoid electrocution/electric shock.
18. Cutting or welding jobs inside the confined space should be carried out after checking for any explosive environment (LEL should be <10%) and by providing localized suction or heavy-duty exhaust systems to prevent accumulation of gases inside the space.

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 confined Space, 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.**

1. Unauthorized operation or repair of any equipment is a punishable offence
2. Use safety goggle, hand gloves, protective clothing and other PPE viz., helmet, gum shoes, dust mask.
3. In the case of GCS tunnel cleaning, the respective furnace GCS pumps shutdown has to be taken and the interconnection water line has to be blanked before starting the job.
4. As both GCS & slag granulation tunnels are located side by side CO as well O2 monitor is required to measure gas presence and ensure safe working.
5. The manholes those are provided along the length of GCS tunnel should be opened and hard barricading.
6. Job has to be started minimum after 6 hrs after stopping of pumps so as to ensure sufficient cooling and ventilation.
7. This activity has to be done under strict supervision of concerned supervisor from start to end of activity.
8. Concerned supervisor should take a permit from area in charge before starting the activity.
9. In GCS (BF2) tunnel a ladder should be used for getting down into the tunnel which will always be kept at the entry point of the tunnel.
10. In case of GCS tunnel more than four number of people can be permitted inside the tunnel for cleaning. Mud to be collected in ghamela and removed out of tunnel.
11. The supervisor in charge should ensure regular breaks after 20 minutes for taking fresh air for person working inside the GCS tunnel. Rotation of the people involved in the activity should be done frequently.
12. The supervisor must write the person OUT & IN timing logged with presence of CO and O2 present inside the tunnel
13. Slurry removed from GCS tunnel to be shifted to designated place if required Hitachi /Backhoe to be used to clear the same with personal supervision.
14. Do not use 230 volts lighting inside the tunnel but instead battery or emergency lights can be used. 24 volts supply wherever available should be used.

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| **Prepared By:**  Head – Production PID I | **Reviewed & Issued By:**  Management Representative | **Approved By:**  Head – Pig Iron Division |
| **Signature:** | **Signature:** | **Signature:** |
| **Date: 15.07.2022** | **Date: 15.07.2022** | **Date: 15.07.2022** |

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