**WORK INSTRUCTIONS FOR CLEANING OF COOLING TOWER BASIN**

**Criteria:** Safe cleaning of the cooling tower basin

**Responsibility:** Cooling tower officer &Mechanical engineer.

**Identified Hazards:**

1. Contact with pressurized water
2. Drowning in the basin due to filling of water above the height of a person
3. Nonuse of PPE
4. Fall of a person due to slipping
5. Inadequate lighting in basin
6. Falling from height while entering the basin.
7. Electric shock
8. Fall of material from top
9. Humid condition while working in tank
10. Use of mobile phone while working
11. Contact with chemically dosed cooling water leading to health problem
12. Smelling of chemical
13. Slipping from the ladder
14. Slippery platform
15. Lone working

**Significant Aspect:**

**1.** Wastage of water

2. Generation of slurry

**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 vapors, 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. Ensure that all persons carrying out the activity wear all PPE’s viz safety hand gloves, gumboots, goggles, helmet etc.
2. Use of mobile phone is strictly prohibited while carrying activities.
3. Unauthorized operation or repair of any equipment is a punishable offence.
4. This activity is to be carried out only in general shift and in presence of production staff in charge and Mechanical engineer (for the purpose of blanking),
5. Before starting the activity take electrical shutdown of the Cooling tower fan for the respective cell in which the activity is to be carried out.
6. Ensure that the incoming water to cooling tower cell to be isolated by closing both return water pipeline valves.Water to be made empty from basin to required level before stopping CT pump.
7. Blanking (isolation) of the respective basin will be done by installing wooden planks and metal plates at the sluice gates area inside the cooling tower.
8. A submersible pump will be installed 300 mm from the bottom of the cell for de- watering.
9. Ensure pump is connected through ELCB (earth leakage circuit breaker) and functioning of pump tripping is checked through ELCB. Basin floor to be cleaned thoroughly after cleaning manually with the help of water hose.
10. This submersible pump will pump the water present in that particular basin to the other cell so that minimum water remains in basin while carrying out the activity.
11. Ensure that the excess water present in basin is pumped to the overhead tank.
12. Lower and lock the ladder for going in and out of the cell.
13. Check the stability of the blanking at sluices gate to avoid sudden breakage of the blanking arrangement. If required further sealing to be ensure to avoid seepage before allowing persons to enter the cell.
14. Ensure that persons carrying out the activity enters the basin only when the water level is minimum (floor is visible).
15. Person entering the basin should wear gumboot instead of safety shoes.
16. Ensure drain valve of the cell is kept open.
17. The persons should start stirring the water manually with the help of a spade & push the sedimented slurry towards the slurry pump.
18. Slurry pump to be used for pump out.
19. In case of thick slurry same to be cleared manually.
20. Once the cell is cleaned up the people will move out of the cell and the pump will be taken out.
21. The production In charge should compulsorily be present from start to end of the cleaning activity as well as the safe removal of the persons from the cell.
22. Start filling water in the cell with fresh water
23. Handover to mechanical to remove the blanks from the sluice gate once the basin is full

|  |  |  |
| --- | --- | --- |
| **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** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Amendment Record** | | | |
| **Revision date** | **Manual Section ref. and para** | **Brief details of revision** | **New Revision No.** |
| 12.07.2021 | Procedure for cleaning and cooling of Tower basin | Point no 6,9 | 04 |
| 15.07.2022 | Procedure for cleaning and cooling of tower basin | Hazard no 14 identified | **05** |
| 03.03.2023 | Procedure for cleaning and cooling of tower basin | New hazard added | **06** |