**WORK INSTRUCTIONS FOR PROPORTOINING BINS LINERS REPLACEMENT**

1.0 PURPOSE

This procedure is developed to cover the safe practices required for safe entry and working in Confined Space and to establish mandatory requirements for protecting personnel from hazards associated in this confined space of proportioning bin for liner replacement job.

2.0 SCOPE

Centralized Confined Space Procedure VL/IMS/VAB/SP44 Y

This procedure applies to confined space: VL/IMS/VAB/PID2/SP/WI/58

3.0 RESPONSIBILITIES

Operation Head : For day to day activities.

Shift Incharge : Overall Shift performance.

Shift Supervisor : To ensure the people are following the procedure.

4.0 PROCESS DESCRIPTION

**4.1 DO’S**

1. Workers entering the space shall be trained on confined space and entry procedures & authorized to work in confined spaces.
2. Permit requestor shall prepare the work permit with details of Isolations required and other special permits required. The permit shall be completed in all aspects.
3. New work permit to be taken after every 8 hrs.
4. Workers entering the space shall be selected and recorded on the work permit as well as in in/out entry book.
5. Workers shall be made aware of possible hazards that may be encountered on that job. Shift wise Toolbox Talk shall be carried out and recorded on the work permit.
6. Appropriate danger signage shall be posted. Ensure area barricading before opening the confined space entry point.
7. Appropriate personal protective equipment shall be selected and issued to affected employees.
8. Oxygen level testing shall be carried out by Authorized Gas tester at defined frequencies and results recorded on work permit and in/out entry book.
9. Standby (Attendant) person has to log down the in/Out entry of all entrants and ensure that entrant should 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 confined space.
11. Work in confined space may be done in night duty hours also (depending upon the criticality) with prior permission of safety head and operation head.
12. New work permit to be taken after every 8 hrs.
13. Unauthorized operation or repair of any equipment is a punishable offence.
14. Before putting Entrant (Fitter/welder/Rigger) on job attendant must ensure that Entrant (Fitter/welder/Rigger) should familiar with the operation and maintenance.
15. Before entering bunker ensure that shutdown of Weigh feeder, Air blasters, Vibrators of respective bunkers.
16. Before entering bunker ensure about availability of O2 presence.
17. Check the platform for rust and damage.
18. Check the certified ladle for its looseness, to avoid falling of person.

**4.2 DONT’S**

1. Do not bypass SOP.
2. Don’t enter in Proportioning bunker without checking oxygen level.
3. Unauthorized operation or repair of any equipment is a punishable offence.

**4.3 POSSIBLE HAZARDS & MITIGATION MEASURES INSIDE THE CONFINED SPACE**

* **Entrapment hazard**: Proportioning bunker are filled with materials always. When taking job of liner replacement ensure all bunker is empty throughout and from side walls too or otherwise there is possibility of material falling from above on the person working below causing entrapment.
* **Oxygen deficiency:** Due to the enclosed nature of the Proportioning bunker there may be a possibility of Oxygen deficiency. Also if hot work is carried out inside there may be Oxygen deficiency due to fugitive emissions. Gas testing shall be carried out using Multigas meter before entering the proportioning bunker. Entry shall only be made if the Oxygen level inside is between **19.5% - 23.5%.** If the Oxygen level is less than 19.5%, forced ventilation shall be provided and level ensured between **19.5% - 23.5%.** Frequency of gas testing shall be done once in every two hours and before entering the confined space.
* **Fire & Explosion:** NIL. However test the Lower Explosion Limit using Multigas meter and ensure **Zero level.**
* **Exposure to toxic gases:** Nil

**4.3 PPE’s & OTHER SAFETY EQUIPMENT REQUIRED:**

* Reflective Jacket
* Hand Gloves
* Safety Helmet
* Safety Shoes
* Safety Goggles
* SCBA (if required)
* Life line extending outside with double harness. (If required).
* 24 V DC lamps only inside confined space.

**4.4 ISOLATIONS REQUIRED:**

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| --- | --- | --- |
| **ENERGY SOURCE** | **HAZARDS PRESENT** | **ISOLATION** |
| **Electrical** | YES | Weigh feeder Conveyor and vibrators below respective bunker in which work to be carried out must be electrically isolated with LOTO LOCKS. |
| **Mechanical/Kinetic** | YES | Air blaster and Rod gates and to be put to avoid any material from falling on weigh feeder belt from inside bunker. |
| **Hydraulic** | NO | NO |
| **Pneumatic** | NO | NO |
| **Steam** | NO | NO |
| **Chemical** | CO | NO |
| **Thermal** | NO | NO |
| **Radiation** | NO | NO |
| **Poor Illumination** | Yes | Use 24 V DC lamps only inside confined space. |

**IDENTIFIED HAZARDS :**

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| --- | --- | --- |
| **Energy Sources** | **Potential hazards** | **Consequences** |
| Electrical | * Electrical & Instrumentation cables | * Burn injuries * Electrical shock in welding |
| Kinetic |  |  |
| Mechanical | * In haling of dust * Fall of people * Fall of material | * Fractures |
| Potential | * Air puffing * All steady structures | * Dust on body * Trip & fall on bunker |
| Thermal | * Heat/Humidity from the bunkers | * Burn Injuries |
| Chemical | * Lubricants * Water | * Slip & fall * Water borne disease |
| Radiation | * NA |  |
| Biological | * Mosquitoes * Birds | * Birds attack * Mosquito bites |
| Bio mechanical | * Body posture of worker entering the bunker. | * Body Pains * Fractures * Disabilities |

* 1. **Procedure:**

## Activity No 1 : Replacement of bunker liners.

1. Before Entering in to bunker ensure –
2. Take electrical shutdown of Weigh feeder, Air blasters, Vibrators of respective bunkers
3. Isolate and lockout air main valve and drain all residual pressure from the system & receiver tank.

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

1. Press local push emergency button of the Equipment.
2. Ensure trolley drive is locked by fixing stopper.
3. Cover the grizzly with MS plate/GI sheets.
4. Portable tools should be certified.
5. Bunker temperature should be less than 45’C.
6. O2 Level should be 19.5 to 23%.
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 bin.
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 must log down the entry details of all Entrants.
13. Check of Internal atmosphere of the space for enough oxygen content (19.5% to 23 %) flammable gases and vapours, and the potential for toxic air contaminants before entering bunker. If there is any deviation, please do not enter.
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 bunker should be recorded.
17. Use 24V DC supply illumination to avoid electrocution/electric shock.
18. Hopper needs to be emptied /partial filled to be decided as per working condition.
19. Cut the bunker 800\*800mm for manhole purpose.
20. In case you are working below belt then
    * + Before starting the job, cover belt below with GI sheet or MS plate of required length.
      + Ensure trolley drive is locked by fixing stopper for in case of Bunker no 1 to 6, (it should be stationed)
      + In case of Bunker no 7 to 15 S/d of conveyor belts both top and bottom.
      + Rope ladder & lifeline to be used for entering in bunker.
      + Temporary working platform to be erected if required.
21. Remove the load cell of bunker with help of instrumentation dept.
22. Enter the bunker by using ladder.
23. Remove the damaged liner plate by gas cutting.
24. Fix new liner plate with bolts and tag weld for additional safety.
25. Once the job is completed, ensure that all scrap generated is shifted from site and the GI sheet or MS plate is removed.
26. Clear electrical shut down and take trials in manual mode, wherever possible.
27. Hand over the equipment to Production dept.

* Work permit to be taken as per required procedure stated in SP44Y.
* Allow entrants to enter HESP and start Inspection of HESP for cathode, anode, rapper hammers and dust in hoppers.
* After entering in HESP, check the grizzly platform (made of rods) for its looseness, if found any deviation correct it if not, stop the work and don’t allow any person to go inside HESP.
* If inspection Ok and everything is normal then carry out cleaning jobs of cathode plate, anode (emitting rods) from inside, if required use small hammer and ensure that nose mask is being used and special coat is being used by entrant.
* Check the hammers for its looseness, and strike, if found any deviation ask mechanical to correct it.
* Check the appearance of the cathode plates and emitting rods, if found any deviations like bent, broken, touching each other then ask mechanical team to replace it.
* After job completion ensure that all involved crew members are come out from HESP and close the manhole/inspection doors
* Normalize the system and release all equipment shutdowns and close the work permit.
* All material collected into dust hoppers to be empty out.
* Give the clearance to HOD, SS from your side that your assigned job is completed.

**4.6 RESCUE PLAN:**

**4.6.1 Prior to entry and/or work in the Confined Space:-**

* The permit requestor, permit approver and safety officer will ensure that the on-site rescue plan for the confined space has been completed and that all the rescue equipment identified in the plan is available to affect a rescue in the confined space.
* The permit requestor, permit approver and safety officer will ensure that an adequate number of appropriately trained personnel are available for immediate implementation of the rescue if so required.
* The permit requestor, permit approver and safety officer will ensure that all personnel in the rescue team understand and know their roles and responsibilities and have signed the rescue plan prior to any personnel entering the confined space. Ensure everyone is aware of the evacuation alarm.
* The Stand by person must establish communication with all workers (inside and outside of the confined space) using the means described in the rescue plan.

**4.6.2 On entry and while working in the Confined Space:-**

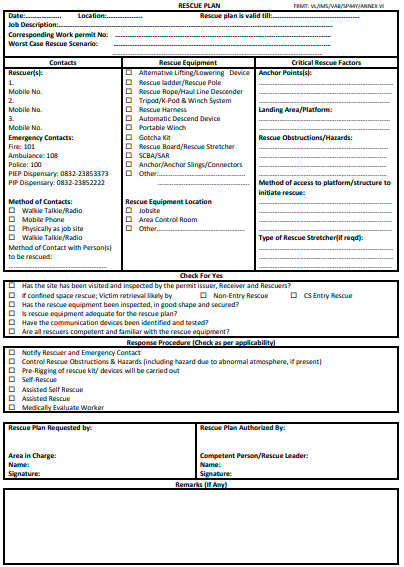
* The Standby person, who is stationed outside and near the entrance to the confined space as shown in the rescue plan, remains in constant communication with all workers inside the confined space.
* The Standby person must be notified immediately if an entrant recognizes: -
  + Unusual action or behavior.
  + An unexpected hazard
  + An unsafe act
  + Detects a condition prohibited by the permit
  + Rescue equipment for vertical/horizontal retrieval from top/side manhole; to be kept ready with rescue team.
* Personnel must exit the confined space as quickly as possible, when: -
  + An order to evacuate is given by the Standby person
  + An entrant recognizes a sign or symptom of exposure
  + An unacceptable condition arises
  + An evacuation alarm is activated

**4.6.3 In the event of a confined space rescue: -**

* Call security and rescuers at site, explain what is happening and where
* Call Ambulance and fire brigade (if required).
* Call ambulance at site.
* Call first aiders at site.
* Attempt to communicate with the Entrants in the confined space to establish what injuries exist and what conditions exist that may impede the rescue efforts.
* Check the atmospheric conditions to determine if respirators or supplied oxygen are required.
* Ensure that an Attendant is in place outside the entry point to assist the rescue team.
* Rescue team to enter proportioning from inspection door (horizontal entry).
* If any entrant found to be injured, then rescue team can take help of first aider.
* Plan for the Entrant(s) extraction. This may require the use of stretchers, etc.
* Rescuers must ensure the safety of the injured Entrant(s) during the extraction procedure.
* Entrant Once retrieved from confined space, provide any additional first aid required to stabilize the Entrant(s) until an ambulance arrives.
* Secure area and ensure that no one enters the confined space until it has been reassessed and deemed safe to enter.

**4.6.4 Rescue Equipment**

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| **PARTICULARS** | **REQUIRED YES OR NO** | **REMARKS (IF ANY)** |
| Harness | Yes |  |
| Tripod | Yes |  |
| Multi Gas Detector | Yes |  |
| Hazardous Chemical Suit | Yes |  |
| First Aid Kit | Yes |  |
| Life / Rescue Line | Yes |  |
| Self-Contained Breathing Apparatus | Yes |  |
| Stretcher | Yes |  |
| Temperature Gun | Yes |  |
| Lux Meter | Yes |  |



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| --- | --- | --- | --- |
| **Date** | **Manual Section Ref. & Para** | **Brief details of Revision** | **New Rev.** |
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| Prepared By:  Ass. Manager – Sinter Plant | Reviewed & Issued By:  Management Representative | Approved By:  Head Sinter Plant |
| Signature: | Signature: | Signature: |
| Review Date: 22.10.2022 | Review Date: 22.10.2022 | Review Date: 22.10.2022 |