1. **PURPOSE:** To describe the procedures for Safe working inside quench tank.
2. **SCOPE:** Battery 1Quench tank.
3. **RESPONSIBILITY:** Company Engineer, maintenance Fitter and workmen at job
4. **SAFETY PRECAUTIONS:**

* Ensure Proper illumination at all times.
* Quench Tank is a confined space and any entrant should possess a valid pass for working in confined space.
* Standby person is required and he will maintain the details of entry and exit inside the quench tank.
* Gas testing meter should be used while working inside the tank.
* Preferably carry out the work in General Shift Hours.
* Ensure all surrounding platforms and hand railings are safe and certified for use.
* Ensure all tools and tackles are certified for safe use by mechanical department.
* For Gas Cutting/welding involved, if any (Refer SP –44).
* Ensure persons working are conversant with associated hazards while performing the activity.
* Ensure availability of valid fire extinguisher at nearby location.
* Ensure the inner surface of the quench tank is dried up before carrying out the job.

1. PPE’s to be used:

* Safety Helmet,
* Safety shoes,
* safety hand gloves,
* Safety Goggles,
* Dust mask,
* Full body Harness (wherever required)
* gas analyzer for measuring oxygen level in the tank.

1. **Aspect-Impact:**
2. Scrap generation Resource Depletion.
3. Fumes Generation Air Pollution.
4. **Hazards** **identified**
5. Physical Hazard

* Water ingress
* Electrical shock

1. Mechanical Hazard

* Impact, Entrapment, Entanglement, Cut, Slip , trip and fall

1. Chemical Hazard

* Fire and explosion, fumes.

1. Ergonomical Hazard

* Poor workplace design
* Confined space

1. Human behaviour aspect of operators:

* Alcoholism.
* Casual approach.
* Horse play.
* Non usage of PPE’s
* Improper Housekeeping
* Height Phobia

1. **PROCEDURE:**

* Engineer-in-charge shall ensure the following before commencement of work.
  + Take PWD pump no.03 and 04 shutdown for B1/Qunech pump #1 &2 for B2 . Empty the quench tank by manual quenching.
  + Take shutdowns of Quench Valve and Quench Pusher blade.
  + Jack up the incomer pipe to quench tank and insert dummy flange in between the two flanges and secure by fasteners. (To avoid water entering).
  + Close the connecting valve of F and S pump to the Quench Line.
* The workmen shall then enter the tank by opening the manhole cover .The cover shall be kept open to avoid suffocation and as a means for exit in case of emergency.
* Another co-worker inside the tank shall accompany welder, during actual welding work.
* Welder shall come out of the quench tank to the surface to avoid suffocation at regular intervals of two hours or as comfortable to the welder. (if activity is going to last more than 2 hours)
* Remove all men, material and welding stubs after completion of work
* The plant shall be normalized after completion of job by engineer-in-charge by following the instructions taken before commencement in reverse order.
* Do carry proper housekeeping of the area as per procedure SP 44 D.
* Remove the all machines/ tools / scrap and shifted to proper designated areas
* Close all the manholes & close the work permit

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

***Do’s:***

* Use PPE’s
* Follow SOP.
* Work permit to be issued for 8 hrs and can be extended based on the risk identified in work permit and at site are similar.
* Before entering into any quench tank ensure that respective energy sources of equipment are isolated and LOTO locks are provided.
* Unauthorized operation or repair of any equipment is a punishable offence.
* Before putting Entrant (helper/operator) on job attendant must ensure that Entrant (helper/operator) should familiar with the operation.
* 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.

Don’ts:

* Twist the chain while handling material.
* Directly bind the load with the load chain.
* Allow extreme slant slinging.
* Overload the chain pulley block.
* Over lift the material.
* Overload any crane/hoist/lifting tool/trolley above 75% of the SWL.
* Manually lift the material whose weight is more than 50 kgs.

Pre-checks:

* Take the work permit from HOD, Safety for entering inside the chute as it is confined space.
* 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 .
* 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 .
* 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.
* 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.
* In some cases In/Out time may be relaxed /extended based on the risk involved in the particular confined space.
* Check Internal atmosphere of the space for sufficient oxygen content (19.5% to 23.5 %) flammable gases and vapor's, and the potential for toxic air contaminants by the use of multi gas detector, if required use pump with extension before entering into quench tank. If there is any deviation, do not enter into quench tank.
* 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.
* Check for suitability of equipment that is used at the confined space.
* Check any dust due to which visibility is reduced or respiratory tract is irritated.
* Ensure the entire person deployed for the job are well aware of the work procedure.
* Take shutdown of all related equipment with v-loto.

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 Quench tank, 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.

(Safety shoes, safety helmet, Dust mask, safety goggles)

1. **REFERENCES: OEM Manuals & reference drawings, SP44, SP45**
2. **RECORDS:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Record No.** | **Record Title** | **Maintained by** | **Soft/Hard form** | **Retention Time** |
| 1. | HI/27 | Hazard Identification | IMS | Soft | 1 Yr |
| 2. | RA/27 | Risk Assessment | IMS | Soft | 1 Yr |
| 3. |  | In/out entry | attendant/ stand-by person | Hard | 1 Yr |
| 4. |  | levels of gases | attendant/ stand-by person | Hard | 1 Yr |
| 5. |  |  |  |  |  |
| 6. |  |  |  |  |  |

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| **Signature:** | **Signature:** | **Signature:** |
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