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## **CONFINED SPACE**

### **MCW – MS/ FRP line repair and storage sump tank cleaning.**

Objective	FRP line repair work confined space
Responsibility	Engineer in charge and workmen at job
PPEs to be used	Helmet, Safety shoes, safety hand gloves, ear plugs and nose mask

#### Aspect-Impact

Fumes, gas leakage	air pollution
Noise generation	noise pollution
Steel Scrap	Resource Depletion
Water Spillage	Land contamination

#### Hazards Identified

Mechanical Hazard	Slip, fall and trap
Health hazard	Lack of Oxygen gas and other fumes
Human behavior	Poor housekeeping, Non use of PPEs, Alcoholism


#### SAFETY PRECAUTION

24 volt DC supply should be used for providing illumination  
Cotton/Leather hand gloves, nose mask, white/black goggles should be used  
Proper checking of Welding machine, gas cutting set, grinding, cut off, flexible grinding machine, etc.,  
While one person is working inside, one person should always be there outside continuously to communicate and monitor to inside person.  
The person working inside should wear Full Body harness (FBH) and one rope should be tied to FBH and the other end of rope should be tied outside of MCW inside pipe.  
Breathing apparatus should be kept with the person outside.  
Also presence of any flammable gases to be checked.  
Proper illumination to be ensured.  
Before starting of gas cutting or welding work bottom areas must be free from fire catching media or covered or clean area.  
Fumes rising from confined space where there was no manholes, keep or arrange the opening from availed spaces or else provide exhaust fan for removal of fumes

#### DO'S

- 1 Dust generation.
- 2 Inside heat of MCW inside pipe.
- 3 Use PPE's.

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- 4 Follow SOP.
- 5 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.
- 6 Unauthorized operation or repair of any equipment is a punishable offence.
- 7 Before putting Entrant (helper/operator) on job attendant must ensure that Entrant (helper/operator) should familiar with the operation.
- 8 Before entering into MCW INSIDE PIPE ensure that shutdown of MCW Pump is taken.
- 9 Before entering into MCW INSIDE PIPE ensure about non availability of other gas. presence.


#### **DONT'S**

- 1 Do not by pass SOP.
- 2 Don't enter in MCW INSIDE PIPE in presence of other gas.
- 3 Don't enter in MCW INSIDE PIPE if temp is high.

#### **PRECHECKS**

- 1) Before Entering in MCW INSIDE PIPE ensure –
  - a) All MCW Pump must be in operation shutdown with LOTO.
  - b) All Pump Discharge Valve must be in operation shutdown with LOTO
  - c) MCW Main inside temperature should be less than 40 degree Celsius.
  - d) Attendant must ensure proper illumination, if illumination not found ok, he must inform concern electrical person to provide additional hand lamp for inside. Cross check the waste water/slurry/HSD/other mud etc., level inside the tank. If it is more than 0.25mtr, slurry pump can be utilized instead of manual cleaning and eliminating confined space hazard. ,
  - e) Take the work permit from HOD, Safety for entering inside the MCW Main as it is confined space.
- 2) 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 .
- 3) 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 .
- 4) 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.

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- 5) 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.
- 6) In some cases In/Out time may be relaxed /extended based on the risk involved in the particular confined space.
- 7) 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 into MCW INSIDE PIPE. If there is any deviation, do not enter into MCW INSIDE PIPE.
- 8) Check inside temperature and it should be is in the tolerable range (25 deg C to 40 Deg C). If the temperature is not within limits then appropriate ventilation to be used.
- 9) Check for suitability of equipment that is used at the confined space.
- 10) Check any dust due to which visibility is reduced or respiratory tract is irritated.
- 11) The sign-in and sign-out of all persons entering into MCW INSIDE PIPE should be recorded.
- 12) Use 24V DC supply illumination to avoid electrocution/electric shock.
- 13) Ensure that main fan damper is in open condition for natural draft during inspection and cleaning job in MCW INSIDE PIPE.
- 14) If everything is OK, enter into MCW INSIDE PIPE and start Inspection of MCW INSIDE PIPE for pressure part, refractory, GD gate valve.
- 15) 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 MCW inside pipe.
- 16) If inspection Ok and everything is normal then carry out activity.
- 17) After job completion ensure that all involved crew members are come out from MCW INSIDE PIPE and close the man hole of it.
- 18) Normalize the system and release all equipment shutdowns and close the work permit.
- 19) 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 MCW INSIDE PIPE, 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.**

#### **PROCEDURE**

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After obtain clearance from operation department start remove the CWP discharge valve, FRP header flange dummy slowly and get the draining.

Proper line draining system to be arranged by providing dewatering pump.

After completion of draining make an arrangement for entering fresh air in to work place.

Use multi gas detector when entering in to inside pipe line for identify and repair work.

Apply the new frp mat along with FRP jointing solution and repair he damaged line.

After attending work left it for curing 5-6 hours.

Start the assembly of valve and dummy accordingly and charge the line by opening the CWP suction and discharge valve.

Once the line gets charged by manually check the FRP repair portion.

Kept all vent valve open which is provided in to the system and start the CW pump and inspect the entire line.

After completion of all activities give clearance to the operation department.

### **Procedure storage sump/tank cleaning work/HSD tank cleaning**

Before start of work ensure the rechecks and Work Permit.

Use full body harness with lanyard before entering confined space to have ease of rescue.

In case of height work, Scaffolding to be done by certified scaffolders and later to be certified by competent person. Before entry of scaffolder in confined space, ensure they are properly trained about confined space entry, associated hazards and control measures or they must have confined space pass.

Check the level of slurry or mud with rod or wooden stick. Also check slurry is loose or very hard.

If slurry level is higher than 0.25 meter, slurry pump can be utilized instead of manual cleaning and eliminating confined space hazard.

If the slurry level is lower, same can be removed manually.


If any damage in wall portion is observed, same can be repaired by using suitable sealing compound.

Leakages between Pipe metal and concrete can be attended by filling the gap between pipe and concrete wall of forebay.

In case of HSD, Rubber lined and FRP tank special care has to be taken at the time of cleaning.

Strictly No welding and gas cutting allowed in HSD, FRP and rubber lined Tank. SD t

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Do the housekeeping. After exit of all confined space entrant, close the manhole.

Normalise the isolations after completion of work. Clear the Work Permit and give the clearance to Operations for further actions.

**Note** - Till now no activities carried out in HSD tank.

Leakages between Pipe metal and concrete can be attended by filling the gap between pipe and concrete wall of forebay.

Do the housekeeping. After exit of all confined space entrant, close the manhole.

Normalise the isolations after completion of work. Clear the Work Permit and give the clearance to Operations for further actions.

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