

ANNEXURE-11

Detailed Methodology for carrying out Valve & Valve Chamber Maintenance

A. Checks before starting of work in valve chamber

1. Ensure availability of tools/tackles, first-aid box, and safety harness (if required) before job execution
2. Take necessary permits (as per WA/PTW matrix) and ensure its availability for entire duration of work
3. Carry out site specific risk assessment; discuss every person's individual role, identify risk, control measures and emergency arrangements
4. Ensure availability of Emergency contact list, nearest hospital details
5. Ensure that persons involved in the activity are trained and competent
6. Ensure PPEs with all persons involved in the activity

B. Maintenance of valves & valve chamber

1. Carry out tool box talk before starting the work and record it. Check and reinforce safety requirements with all personnel involved
2. Cordon the area for maintenance with soft barricading and hard barricading in heavy vehicular movement area / congested area /city area
3. Check air sample with leak surveyor for NG on top of chamber before lifting the sleeper/ opening the cover and record it.
4. Check the strength of the hook of the sleeper before lifting
5. For gas concentration in PPM, carefully open one of the sleepers from edge of chamber and wait for 5 min to allow release of accumulated gas.
6. Open another sleeper from opposed side to facilitate natural flow of air to reduce concentration of gas in the chamber.
7. Again, check gas concentration and O₂ level at top of the chamber and inside the chamber.
8. Continue these checks intermittently during the work in chamber
9. Clean the sleepers, valve, chamber wall, floor, pipe section if necessary. Ensure that the garbage/scrap is disposed safely at a designated garbage/scrap area.
10. Carry out dewatering of the chamber with buckets/dewatering pump if necessary. Ensure that the water is disposed of into drainage system to avoid land/vegetation contamination.
11. Measure the depth of chamber. In case the depth is greater than 1.5 m then use full body safety harness for entry & work in the chamber. Ensure that all

necessary requirements are fulfilled for confined space activities mentioned in clause 7.0 (d)

12. Take help of steps to enter in the chamber
13. Check pipe, valve and flange connections with leak surveyor and soap solution.
14. Carry out operation of valve and greasing as per OEM recommendation with hydraulic/pneumatic grease gun. (Use lubricant/grease as per OEM manual/instructions)
15. If the valve is found to be inoperable/difficult-to-operate, carry out purging as per clause 7.0 (c) to release the old lubricant, if the case may be.
16. If initial valve position is close, do not operate it (applicable only to main network isolation valve). If valve is already in open condition, operate the valve 75% clockwise and anti-clock wise to make valve free in operation. If valve is still found inoperable/difficult-to-operate, then again carry out the greasing by using pneumatic/hydraulic grease gun (as per OEM manual) in case the availability of greasing point
17. Carry out the Maintenance of ½", ¾" & 1" Ball Valve, Needle Valve for Vent-Drain & Greasing Point by operating & Oiling If found necessary, carry out painting of valve and valve chamber as mentioned in clause 7.0 (e)
18. Mention the depth on chamber wall at 1.5 m from bottom of chamber and also actual depth of chamber on top of chamber wall
19. Come out of chamber. Put back the sleepers/ close the cover carefully and close the site

C. Purging & greasing of Valves

1. Purging of valve is to be done with the use of pneumatic/hydraulic grease gun (as per OEM manual)
2. Try to operate valve to ensure spread of purge over entire body of ball/plug.
3. After purging, do not operate the valve for 24 hrs. until & unless it is absolutely required.
4. After 24 hrs. Operate valve and check whether the valve has become smooth in operation or not.
5. Carry out greasing of the valve with pneumatic/hydraulic grease gun (as per OEM manual)

D. Greasing of Valve Gear Box (if required).

1. Open the top cover plate of gear box housing
2. Check the condition of gear assembly and lubricants
3. Carry out greasing of the gear assembly if required.

E. Requirements/control measures for work in CONFINED SPACE (depth >1.5 m)

1. Ensure that work is carried out in compliance to HSE-G-04 Guideline for Entry into Confined space and HSE-G-06 Guideline for **GEL** Life Saver — Confined Space Entry
2. Ensure that persons entering in confined space are trained.

3. Every team member is clear with his role during work i.e. entrant (person who enters the chamber for maintenance), site supervisor, attendant, and helper. Ensure persons designated to enter in chamber are only allowed to do so.
4. Safety harness is to be checked visually before each use.
5. Full body safety harness is to be put on by person entering in the chamber.
6. A person — attendant serves as anchorage point and would hold the lanyard/rope firmly while entry in the chamber and during entire course of work in the chamber by the entrant.
7. Attendant has to keep an eye on the person working in chamber and should have eye/verbal contact with the person to check for any signs of dizziness/unconsciousness of the person inside the chamber.
8. Attendant has to be alert enough to sense dizzy movements of the entrant and should pull the entrant immediately out of the chamber in case of any such signs.
9. Attendant has to understand the use of the safety harness / rescue equipment.

F. Painting of valve, valve chamber, sleeper and its frame

Valve

1. Clean the valve, flanges and studs/nut bolts properly.
2. Apply paint remover wherever possible and wait for the paint to disband
3. Use copper wire brush and remove the paint
4. Clean the surface properly with cloth to avoid any grease/oil before applying the paint
5. Apply red oxide on the valve, flanges and studs
6. Leave the red oxide to dry
7. Apply enamel paint on the valve
8. Ensure that the greasing points/stems are not painted to avoid any trouble during greasing/operation.

Valve Chamber:

1. Clean the chamber walls with broom/cloth.
2. Using wire brush, scrap the wall to remove the white paint applied earlier
3. Clean the wall surface properly with dry cloth before applying white wash
4. Apply white wash (with stainer if required) on the walls.
5. Paint valve chamber number on one of the four sides of the valve chamber wall. If there is no place, paint the valve chamber number on any nearby deserted structure for reference.

Sleeper and its frame:

1. Clean the sleepers and its frame with broom/cloth
2. Remove the paint with scrapper

3. Clean the surface properly with cloth to avoid any grease/oil before applying the paint
4. Apply red oxide on the metal part of sleepers and frame
5. Allow it to dry for half an hour
6. Apply enamel paint on the sleepers and frame

Color Coding:

1. Isolation and tap off valves with blue colour on steel network as per the painting specifications
2. Vent valve with blue colour as per the painting specifications
- 3.** Steel pipe portion inside the chamber to be painted yellow as per the painting specifications.