

**SAN JOAQUIN VALLEY UNIFIED  
AIR POLLUTION CONTROL DISTRICT  
COMPLIANCE DEPARTMENT**

**COM 2225**

**APPROVED:** \_\_\_\_\_ **SIGNED** \_\_\_\_\_ **DATE:** April 26, 2007  
**Jon Adams**  
**Director of Compliance**

**TITLE:** **RULE 4623 - ORGANIC LIQUID STORAGE**

**SUBJECT:** **INSPECTION OF ORGANIC LIQUID STORAGE**

**OBJECTIVE:**

To establish District policy and procedures for equitable and efficient implementation of Rule 4623 - Organic Liquid Storage.

**PURPOSE:**

Rule 4623 and associated permit conditions require air pollution sources to limit the volatile organic compounds (VOC's) discharged to the atmosphere. District inspectors are responsible for determining compliance with gas-tight requirements, seal gap limits, and record-keeping procedures and results.

**POLICY STATEMENT:**

District staff will enforce Rule 4623 and permit conditions pertaining to the discharge of VOC's. Failure to comply with the requirements of this rule is a violation and may subject the source to enforcement action. Specific sources may be permitted with special conditions, which may restrict volatile organic compound leaks or seal gaps to a requirement more restrictive than that allowed under Rule 4623.

**I. PRE-INSPECTION ACTIVITIES FOR ALL TANK TYPES**

**A. Safety**

The following safety equipment is required for tank inspections. Some tank inspections may require additional safety equipment, and where the source safety requirements are more stringent; the inspector shall follow the source requirements.

1. H2S monitor except for light oil sources

2. Hard hat
3. Steel-toed shoes or boots

B. Inspection Equipment

1. Hydrocarbon analyzer that has been calibrated within last month with the appropriate gas (10,000 ppm for oil production, pipeline, and refinery tanks, 1000 ppm for winery inspections).

At the source's request, the inspector shall verify the accuracy of the District hydrocarbon analyzer by:

- a. Providing calibration records for that unit, and, or,
- b. Conducting an analyzer check with the source's calibration gas. Said gas must be current, certified by the manufacturer to within 2% of stated value, and the value must be approximately equal to the leak definition in the appropriate rule. The source shall have the proper paperwork readily available or the gas bottle must be clearly labeled with the gas expiration date, accuracy, and concentration. District and source instruments shall be checked in sequence. The inspector can decline the analyzer check if it can not be completed promptly (approximately 15 minutes).

2. Copies of permits and field inspection forms

## II. EXTERNAL FLOATING ROOF TANK INSPECTION PROCEDURES

A. Equipment

The following safety and inspection equipment will be required:

1. SCBA for each inspector
2. H<sub>2</sub>S monitor(s)
3. Hard hat
4. Steel-toed shoes or boots
5. Probes for measuring gaps
6. Paddle for pulling secondary seal back
7. Properly calibrated hydrocarbon detection device
8. Two pieces of different colored chalk or carpenter crayons
9. Roller measuring device
10. Copies of permits and field inspection forms

11. Three-way monitor
12. Body harnesses and safety line

B. Pre-Inspection Activities.

1. Coordinate schedules with other inspector(s) who are to conduct the inspection to prevent conflicts.
2. Verify that the SCBA, three-way monitor(s), and H<sub>2</sub>S monitor(s) are charged, properly calibrated, and in good working condition. The three-way monitors are to be calibrated each day of use. Verify the hydrocarbon analyzers (TLV) are charged and have been calibrated within the last 30 days. SCBA tanks must have current certification.
3. Review company's permits (PTOs & ATCs), past inspection reports, and tank storage records in order to familiarize oneself with the company's operations and to determine compliance with Rule 4623.
4. At the time of inspection discuss with the host company its safety and inspection policy and plan the inspection accordingly. These District safety policies are the minimum requirements. Host company policies, if more stringent, will also be followed.
5. The host company must clear the tank(s) for entry.

C. Inspection Procedures

1. Safety Procedures

- a. Prior to entering a tank, a three-way monitor tied to a rope will be slowly lowered to top of the roof (this may be conducted by the host company). If the LEL, O<sub>2</sub> deficiency, or H<sub>2</sub>S alarm does not activate, the inspectors may enter the tank with the appropriate respiratory protection. If the LEL, O<sub>2</sub> deficiency, or H<sub>2</sub>S alarm sounds, no entry is permitted until the space has been cleared by the host company and re-checked for LEL, O<sub>2</sub> deficiency, and H<sub>2</sub>S.
- b. The following respiratory protection is required:
  1. For tanks containing product, which is known to be free of H<sub>2</sub>S and other hazardous materials, SCBA need not be worn
  2. For tanks containing any other material, SCBA

must be worn by all staff but need not be used unless the three-way monitor sounds for LEL, O<sub>2</sub> deficiency, or H<sub>2</sub>S, at which time SCBA must be used by the staff while immediately exiting the tank.

- c. Body harnesses are to be worn whenever entering a tank. A safety line is to be kept with the standby inspector remaining at the platform at the top of the stairs so it will be immediately available in the event an emergency evacuation is needed. Safety lines are not normally worn by the inspectors due to multiple obstructions on the tank roof, which would tangle the lines.
  - d. Three persons (may be a combination of host company personnel and District inspectors) are required at each floating roof tank inspection.
    - 1. At least one person will remain at the platform at the top of the stairs (attendant). The attendant can be an employee of the host or the District. This person must have communications ability in order to summon emergency help (radio or cell phone). When possible utilize the host company's communication system.
    - 2. The remaining persons (entrants) will descend to the tank roof. Once inside the tank, the two inspectors will stay together unless both are wearing three-way monitors. The three-way monitor must be worn at all times.
  - e. If the LEL, O<sub>2</sub> deficiency, or H<sub>2</sub>S alarm sounds at any time during the inspection all inspectors will exit the tank immediately. The inspection cannot continue until the host company clears the tank and re-checks for LEL, O<sub>2</sub> deficiency, and H<sub>2</sub>S.
  - f. Confirm compliance with District confined space policy.
2. Fugitive Hydrocarbon Leaks
- a. District inspection of fugitive hydrocarbon leaks is conducted every 2-1/2 years. A hydrocarbon analyzer should be used to detect fugitive hydrocarbon leaks around the PV vents, vacuum breakers, leg sleeves, leg socks,

hatches, and gauge lines. If it is suspected Inspectors' movements on the floating roof tank are causing hydrocarbon leaks, wait a few minutes before taking additional measurements.

- b. Check the gauge hatches and sampling wells, which should be equipped with a cover in a closed position, with no visible gaps and leak-free, except when the device is in use.

### 3. Secondary Seal Inspection

- a. District inspection of the entire secondary seal is conducted every 2-1/2 years. Start the inspection below the ladder. Mark this point on the tank wall with a piece of chalk.
- b. If the tank circumference is unknown, use the roller-measuring device to determine the circumference. Write down the circumference on the field inspection sheet.
- c. When gaps are noted, determine which probe best fits the gap (when touching the tank wall the probe barely brushes the seal, but does not move it) insert the probe between the seal and the tank wall vertically and move the probe along the tank circumference as far as it fits into the gap. Using various size probes, as appropriate, determine the length and size of each gap. Make note of any tears, holes, or punctures while inspecting the seals.
- d. Mark the beginning and end of each gap with the chalk and note the size of the gap on the tank wall.
- e. Continue the inspection around the seal using the appropriate probe.
- f. The guide pole or gauging wells shall be equipped with a pole wiper. Measure the gap between the pole wiper and the guide pole, and add the gap measurement to the gap measurement of the secondary seal.

### 4. Primary Seal Inspection

Rule 4623 requires a minimum of 8 locations be checked for riveted tanks with toroid type seals and a minimum of 4 locations

for all other types. Additional locations may be checked if the inspector so desires or suspects a violation.

- a. District inspection of the entire primary seal is conducted every 5 years. Start the inspection below the ladder. Mark this point on the tank wall with a piece of chalk. Since the primary seal is below the secondary seal, one person (preferably the host company representative) uses the paddle to pull back the secondary seal while the other person checks the primary seal with the probes.
  - b. When gaps are noted, determine which probe best fits the gap (when touching the tank wall the probe barely brushes the seal, but does not move it) insert the probe between the seal and the tank wall vertically and move the probe along the tank circumference as far as it fits into the gap. Using various size probes, as appropriate, determine the length and size of each gap.
  - c. Mark the beginning and end of each gap with the chalk and note the size of the gap on the tank wall.
  - d. Continue inspection around the seal using the appropriate probe.
5. Measuring Gaps; roller measuring device
- a. Using the roller device, one inspector measures the length of each gap by size following the chalk marks, and the other inspector writes down the size and length of the gap on the field inspection sheet.
  - b. Total the lengths for each gap size and write them in the appropriate column on the field inspection form.
  - c. Compare the gap lengths that are measured to the allowable gap lengths listed on the approved inspection form.
  - d. If any observed gap length is larger than what is allowed, if any hole/puncture/tear is detected, or if any gas leak is detected above 10,000 ppm, the facility is in non-compliance and appropriate enforcement action should be taken.

D. Record Review

1. Roof Landing Records

The roof shall be floating on the liquid at all times except during initial fill, product change, tank emptying, or refilling. Review tank inventory records and roof landing records for the period since the last inspection to identify periods of time when the tank roof was resting on the leg supports. Verify that the operators have notified the District in writing in accordance with Section 6.3.7 at least 5 days prior to landing the roof on its legs. Electronic notification followed by a hard copy is acceptable.

2. Tank Inspection Records

Operators are required to inspect external floating roof tanks at least once every 12 months to determine compliance with Rule 4623. Review the inspection records including the tank inspection plan, primary and secondary seal gap measurements, and leak-free status of tank fittings.

3. Voluntary Tank Preventive Inspection and Maintenance (I&M), and Tank Interior Cleaning Program

- a. For operators who participate in the voluntary tank preventive I&M, and tank interior cleaning program, review the records on tank inspection, maintenance and cleaning activities. Verify that the operators have conducted inspections and repaired leaks in accordance with the timeframe specified in the I&M program. Verify that the operators have notified the District in writing in accordance with Section 5.7.5 at least 3 days prior to performing tank degassing and cleaning activities. Verify that the operators have inspected the primary and secondary seals within 48 hours after the tank roof is re-floated.
- b. For operators who elect not to participate in the voluntary tank preventive I&M and tank interior cleaning program, verify that the operators have applied for a variance prior to any tank interior cleaning activity.

4. TVP and API Gravity Records

Review the records on TVP, API gravity, type of organic liquid stored, and throughput as required by permit conditions and Rule 4623.

5. Enforcement Actions

Appropriate enforcement action should be taken if the records do not meet the above requirements.

### III. FIXED ROOF TANK INSPECTION PROCEDURES

#### A. Equipment

The following safety and inspection equipment will be required.

1. Hard hat
2. Steel-toed shoes
3. Properly calibrated hydrocarbon detection device
4. Copies of permits and field inspection sheets
5. H<sub>2</sub>S monitors, except for light oil

#### B. Pre-Inspection Activities

1. The files for the company should be reviewed to familiarize oneself with the company's status. Files that should be looked at include: past year's inspection reports, permits (PTOs & ATCs), variances, and active breakdowns.
2. Coordinate inspection times with other inspectors to prevent conflicts.
3. Verify TLV is charged and has been calibrated in the last 30 days.
4. Obtain company determination that it is safe to enter the tank stairwell and/or on roof. Do not go on tank roofs unless authorized. Check only valves that are safely accessible.

#### C. Inspection Procedures

1. Recording of tank parameters
  - a. Record the temperature, tank level, and pressure of tank on the field inspection form, if available from gauges and appropriate per permit conditions.
  - b. If time permits, determine at what pressure the vapor recovery compressor is activated and at what pressure it shuts down. Record this information on the field inspection form.
  - c. Determine pressure vacuum relief valve set points - should be above the pressures noted above.



## 2. Inspection for possible leaks; TLV (Method 21)

- a. Utilizing the TLV, measure the components of the compressor for leaks referring to the TLV measuring procedure. Be sure to check valves, flanges, and discharge lines. Record any hydrocarbon leaks that register on the TLV.
- b. Utilizing the TLV, measure the sampling ports for possible leaks. The sampling ports are usually located at the base of the tank.  
Record any hydrocarbon readings on the field inspection form under the appropriate column.
- c. Utilizing the TLV, measure the sampling/gauge hatches, P/V vents, valves, piping, or fittings located on top of the tanks. Record any hydrocarbon readings on the field inspection form. Be sure to inspect where the gauge line enters the tank. This is a frequent source of excess hydrocarbon emissions. Be sure to measure around hatches, P/V vents, or any covers bolted down. Excess hydrocarbon emissions are often detected where the bolts enter the tank and should be carefully checked.
- d. Any openings to the product must be closed and sealed. Open hatches, covers, etc. are a violation.

### D. Final Review

1. If any hydrocarbon emissions are detected above 10,000 ppm hydrocarbon or any permitted level, the company is out of compliance with Rule(s) 4623/2070 and the appropriate enforcement action should be taken.
2. Transfer the information from the field inspection form to the approved inspection form.

## **IV. INTERNAL FLOATING ROOF TANK INSPECTION PROCEDURES**

### A. Equipment

The following safety and inspection equipment will be required.

1. Hard hat
2. Steel-toed shoes or boots

3. Properly calibrated hydrocarbon detection device
4. Copies of permits and field inspection sheets
5. H<sub>2</sub>S monitor except for light oil
6. 3-way monitor
7. Lexan mirror (about 6" X 6"), do not use glass

#### B. Pre-Inspection Activities

1. Review company files and PAS to familiarize oneself with the company's status. Review should include: past year's inspection reports, variances, and active breakdowns.
2. Obtain company determination that it is safe to use the tank stair and go on the roof. Do not go on tank roofs unless authorized.

#### C. Inspection Procedures

1. An inspector and a company representative should proceed to the top of the tank. Stay away from unprotected tank edges where a fall could occur. Use access points where there are guardrails, catwalks, or a location where there is adequate protection from a fall. Do not walk on any portion of the tank roof that is not strengthened to support your weight. If in doubt, ask the company representative where it is safe to walk.
2. Prior to opening any access points, use the TLV to check for leaks on the gauge hatch, tank fittings, and access points. Record any readings above background. Readings above 10,000 ppm on a tank storing oil that is above 0.5 psi TVP are a violation.
3. Lower the 3-way monitor six inches to one foot down into the opening you will use to view the interior of the tank to determine that the LEL has not been reached. If the LEL is within limits, proceed with the inspection. If the LEL alarm sounds, wait five minutes (with the access point open) and recheck. Do not wait next to the access point. If the recheck still shows explosive levels of VOC, repeat this procedure. A third LEL alarm will terminate the inspection until the company can drop the VOC level to a safe reading.
4. Use the mirror to reflect sunlight onto the tank's internal floating roof for viewing its condition. Sunny weather and proper sun position are essential for good use of sunlight. Exercise caution while trying to get the reflection onto the seal; do not lean into the tank opening.
5. View the interior of the tank through hatches, vents, and manholes

that are in safe locations without risk of fall. Never enter into the confined space above a floating roof for any reason and don't stick your head down into the access openings. Also, be careful not to drop your hard hat through the access and onto the floating roof below.

6. A full tank will make it difficult to view the entire roof and seal areas. A roof height of 1/2 of maximum or lower is desirable. If the entire roof is not visible, re-inspect the tank when the level is lower.
7. Visually inspect the top surface of the roof, main seals, seals around the fixed roof supports and floating roof guide poles, ladders, hatches, level Indicator wires, and all other potential openings in the tank roof. Any missing components causing visible tank contents (section 3.35: visible gaps) are a violation. Whenever possible, use several openings to get a good view of these areas. No gapping is required and you may not be able to see all areas, so view as much as can safely be seen.
8. Vertical wetting of tank walls by VOCs above the roof seal (such as by capillary action) or visible liquids between the seal and tank wall (common with damaged toroidal seals) or on the roof surface are also violations. On occasion, a stilled tank that has recently been lowered in level will have some slight residual wetness on its walls. This wetness does not typically last for more than a few hours and the company's records must verify that the wetness is due to recent tank movement and not a seal defect.

#### D. Records Review

1. Review tank inventory records for the period since the last inspection to identify periods of time when the tank roof was resting on the leg supports.

Sections 5.4.3 and 5.3.1.3 require that the roof be floating at all times except during product change, initial fill, or tank emptying.

2. Records should also be checked for a change in product that results in vapor pressures or throughputs in excess of those allowed by the permit.
3. Appropriate enforcement action should be taken if there are instances where the tank does not meet these requirements.
4. Section 6.1.4.1 requires the operators to inspect the seals on any new or modified tank before putting it into service. Section

6.1.4.2 requires that the operator visually inspect the tank on an annual basis. Section 6.1.4.3 requires that the operator conduct a seal inspection of the tank every 5 years. Records of these inspections are required and should be examined during the inspection.