

# UST Facility Compliance Inspection Handbook

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## Part II - THE INSPECTION

The whole point of doing an inspection is to find out if the tank owner is complying with UST regulations and to educate him about his responsibilities. Some of your inspections will be routine. You know the tank owner or operator. You know that he is interested in keeping his facility in order, and he's on the phone to you every week with a new question. You've been inspecting his facility regularly for 10 years and he's squeaky clean. It's a pleasure having him in your jurisdiction.

But you also have problem facilities. These inspections may not be so routine. You'll be on the lookout for disabled monitoring equipment, sloppy records, and general chaos that spells noncompliance. How do you make a case that your district attorney will agree to pursue?

### A. Documentation

#### 1. Take Pictures

It's hard to argue with the kind of evidence produced by a camera. Take some overall views and then take pictures of specific violations. As you take each picture, jot down in your notebook the date, time, and the subject of the photo. Be sure to record these sequentially so that when you have the photos developed, you won't have trouble identifying each one. Transfer the information to labels, initial the labels, and then put them on the backs of the pictures. (By going this extra step, you avoid making pressure marks on your pictures.)

#### 2. Use a Checklist and Write a Field Inspection Report

Doing a thorough inspection without a checklist is not easy.

You may have been able to start filling out your list back at the office with information about the owner, address, phone, type of tanks, type of monitoring, etc. Then, when you're at the facility, you can check your records against the owner's records. You can use the checklist as your final inspection report, or you can transfer the information from the checklist to a formal report in narrative form. Use whatever works best for you and, at the same time, gives you a complete inspection report.

We have included sample checklists at Appendix F. You may want to customize them to fit your needs or style, or you can contact other local agencies to see about using their checklists. Your agency may choose to develop a new checklist or use existing ones for program requirements. The use of a general checklist plus specific monitoring and construction checklists will enable even the most novice inspector to conduct a thorough inspection.

#### 3. Include Essential Elements in Your Inspection Report

- Time and date
- Facility location, phone, and owner/operator name
- Upgrade compliance certificate number, operating permit number and expiration date
- Purpose of the inspection
- Names of people you interviewed and their titles or responsibilities (e.g., owner,

attendant, tank tester, etc.)

- Type and size of tanks/piping and tank contents.
- Type of monitoring equipment.
- Dates monitoring equipment was serviced/calibrated.
- List of violations or areas where the owner is out of compliance. You can include the references to law or regulation or you can fill this in at the office.
- Identification of previous violations and corrective action taken. You may want to note these items only if your inspection is to see if previous violations have been corrected.
- Description of samples or evidence collected.
- Specific steps the owner must take to correct problems including deadlines for compliance.
- The time the inspection ended.
- Your signature.
- The signature of the person receiving a copy of the report. You may not always get a signature if you've just had a difficult inspection and interview. If the person you interviewed refuses to sign your report, make a note: "Mr. Tank Operator refused to sign this report; a copy was left at the facility."

It's a good idea to make sure the tank owner receives a copy of your final inspection report - even if there were no violations.



## **B. Looking at the Owner's Records** [ H&SC 25293(a)and CCR 2712(b) ]

Finding out how well an operator is keeping his records is as important as inspecting his monitoring equipment. You also need to see whether the information you were given matches the information kept by the operator. If you have the files with you or you filled out the inspection checklist back at the office, you'll be able to find information gaps or other inconsistencies.

Owners are required to keep the operating permit and attachments (monitoring, response, and plot plans) on site. Monitoring, maintenance, repair, lining, and upgrade records may be onsite or at another location (corporate office, for example.) Owners preferring to keep their records off site requires that you plan ahead and schedule your visits.

To avoid misunderstandings, you might want to have the location of the records established in the operating permit (this is not a regulatory requirement). If you permit off-site record keeping, be sure to make an appointment for your inspections. Owners are allowed 36 hours to make their records available to you.

Once you have the records, check to make sure the owner/operator has been implementing the approved monitoring plan for the facility. For certain facilities, you will have to amend the monitoring plan because of new enhanced leak detection requirements for facilities located within 1,000 feet of a well.



## C. What to Inspect at the Facility

In this section, the records and equipment you may be looking at during an inspection are listed alphabetically. What you inspect will, of course, depend on the type of facility, tanks, product, and monitoring equipment at the facility.

### **AUTOMATIC TANK GAUGES (ATGs) [ CCR 2643(b) ]**

ATGs are programmed to monitor volume changes in USTs. They consist of a panel on a wall and probes that sense product level and temperature changes. (See Appendix F for checklist) ATGs have two modes: *inventory mode and leak test mode*.

- When an ATG is in the inventory mode, it provides information about product level, volume, and temperature.
- When the ATG is in the leak test mode, it is checking for product level changes that may indicate a leak.

The ATG is normally in the inventory mode unless the operator is running a leak test.

Some ATGs are equipped with a software program to continuously collect product level and temperature data from the tank. As soon as the system has gathered enough useable data, it will perform a leak test. These are referred to as Continuous Automatic Tank Gauges (CATG). For more information on these refer to “A Guide to Understanding Automatic Tank Gauges”. CATGs have some hardware and some capabilities as ATGs.

Most ATGs come with alarms - leak detection alarms, high-product level alarms, low-product level alarms, high-water alarms, and theft alarms. ATGs can also be equipped with external sensors (liquid and vapor), and line (piping) leak detectors.

- Check the records for any alarms since your last inspection. If there is a record of alarms, what type of alarms were they? What action did the operator take?
- Check for frequent, unexplained high water alarms. This may indicate ground water intrusion into the tank.
- Look for a monitoring box, typically located on an inside office wall, garage, or storage area. Ask for a demonstration to see if it's working. For example, ask to see a printout of the current tank level for each tank.
- Look for the external part of the tank probe in an access manhole above each tank to see how many tanks are hooked up to the ATG.
- Try to determine if someone has tampered with the system, preventing it from detecting a leak if one were to occur. Have the operator dispense a gallon of product from the tank to see if the gallon loss registers on the monitoring box. Then have the operator add the gallon back into the tank to see if it registers.
- Ask enough questions to tell whether the owner/operator knows what the system does and how it is supposed to work.

- Ask to see the manufacturer's manual to see how the equipment is supposed to work, if you are uncertain about the system or the operator's ability to use it. You could schedule a meeting with a maintenance person or vendor representative if you're unsure about the equipment.
- Look to see if there is a leak test report for each tank for each month since your last inspection. Did all the tanks pass? If not, what was done to investigate?
- Does the printout show time, date, tank identification number, fuel depth, water depth, temperature, liquid volume, length of the test, and calculated leak rate?
- Is the recorded leak rate on the printout (in gallons per hour) less than the ATG's leak threshold?
- Did the operator wait the appropriate amount of time after fuel delivery to begin the test? (See LG 113 for specification)
- Was the proper amount of product in the tank for the test? (See LG 113)
- Was there any dispensing during the test? Check the beginning and ending product level to make this determination. (See LG 113)

The facility should have a written monitoring and maintenance plan that describes the equipment training given to the operator at the time of installation. This would give you some idea of what type of questions the operator should be able to answer.

Ask to see all of the monthly test results since your last inspection. The equipment could have had problems at some point in the interim. If so, repairs should have been made and the records should indicate this.

For an in-depth look at automatic tank gauges - how they work, what the regulatory requirements are, what the maintenance requirements are - look at A Guide to Understanding Automatic Tank Gauges, published by the SWRCB. Fax your request for a copy to (916) 227-4349.



## **CATHODIC PROTECTION TESTING** [ CCR 2635(a)(2), 2636(b) ]

Cathodic protection systems must be tested by cathodic protection testers within **6 months** of installation and **then every 3 years**.

A cathodic protection tester must re-evaluate the cathodic protection system within 6 months of any construction on or within the vicinity of a cathodically-protected UST. This is to verify that no damage was done to the electrical system.

- Do the files contain evidence that the 3-year testing is being conducted for both the galvanic or impressed current systems? Is the rectifier for the impressed-current system checked every 60 days? Records pertaining to cathodic protection system maintenance must be kept 6 1/2 years.

Because cathodic testing reports completed by a cathodic protection tester are supposed to be kept in the facility's file, some inspectors will rely on these reports to verify that corrosion protection

exists and is working. Some hands-on inspectors who know about cathodic protection will check the system and perform structure-to-soil tests.

*Definition of Cathodic Protection Tester*

.....someone who can demonstrate an understanding of the principles and measurements of cathodic protection systems... and who has education and experience in those systems as they pertain to USTs.

CCR 2611  
(See LG 145)

There is no State certification for cathodic protection testers.

You won't be able to verify the coating on the tank (because it's buried), but you should be able to verify the type of cathodic protection used, whether there is electrical isolation between pump and piping, and achievement of the -0.85 volt structure-to-soil performance criteria. Non-coated dispenser pans are usually protected by the piping CP system as long as there is electrical continuity between them.

Here's what to look for during your inspection:

Every three years, the tester must perform the following evaluations for both galvanic and impressed-current systems:

1. structure-to-soil voltage potential measurements
  2. verification of isolation and continuity
- Check test reports to see that cathodic protection monitoring has been performed by a trained cathodic protection tester every three years. (See Appendix G for test report form.)



**GALVANIC SYSTEM** (also known as sacrificial anode systems):

Structure-to-soil potential measurements must be taken every three years because they can change during the life of a UST.

- Look for a test station where lead wires are accessible to you. Tank test stations should be over the top of each tank. In the absence of any test station, look for a lead wire at the fill pipe. At newer installations with spill containment, look near the submersible pump.
- To do the structure-to-soil test, use a volt meter and reference electrode to determine whether the steel tank and piping meet -0.85 volts, the most commonly accepted standard of corrosion protection. Place the reference electrode in the soil or backfill. Measurements taken through concrete or asphalt are inaccurate.
- Check for electrical isolation between the pump and piping; look for an isolating union. If the galvanic cathodic protection system test records for piping are in order and there is no

electrical isolation, you might question those test results. Use a continuity tester to verify that the pump and the piping are not electrically connected. For galvanic systems, the pump and piping should be electrically isolated. And if the piping is steel, there should be anodes connected to it for protection. The piping should also meet the -0.85 volt structure-to-soil criteria.

- If lead wires are nowhere to be found or if you can't verify the cathodic protection test records, then require the owner to have the test done by a cathodic protection tester and the results submitted to you within a reasonable period of time. Note on your checklist if you can't verify that the system is working.



### **IMPRESSED CURRENT SYSTEM:**

In addition to the 3-year evaluation performed by cathodic protection testers, rectifiers for impressed-current cathodic protection systems must be checked at least every 60 days. The regulations do not specify who does this 60-day inspection, so local agencies should have a policy. Will you allow an owner or operator to do the inspection as long as they know what they're doing? Or will you require a maintenance person to do it? If appropriate, ask for a demonstration of the inspection process.

- Look for a rectifier box on the office wall with a pilot light that indicates the electric current is turned on.
- Check the voltage and amperage readings. Are they consistent with readings previously recorded? Rectifiers usually contain volt meters and ammeters to monitor the system's performance. If the readings aren't consistent, ask to see the service records and for an explanation why the settings were changed.

These readings should be recorded every 60 days (see Appendix G for a sample form for recording these readings).

*Rectifier settings should be changed only by a corrosion engineer (or under his direction).  
Owners and operators should never move these dials or terminal connections.*



## **TECHNICAL NOTES ON CATHODIC PROTECTION SYSTEMS**

### **Galvanic (sacrificial anode) Systems**

These systems are generally used on new double-wall steel coated USTs.

Pre-engineered galvanic cathodic protection systems have the following four interrelated methods

for protecting the tank: dielectric coating, electrical isolation devices (e.g. nylon bushings and gaskets), sacrificial anodes, and test stations.

Sacrificial anodes make use of the natural difference of electrical potential between the anode and the tank. These systems can protect only small areas of exposed metal and require separate anodes for tank and piping (including dispenser containment).

Tanks protected with sacrificial anodes should be equipped with fittings for electrically isolating the different parts of the system (i.e., tank, piping, and especially the pump.) These fittings may be nylon bushings, isolating unions, or bolted flanges. Without electrical isolation, the sacrificial anodes will attempt to protect anything that is electrically connected to the tank or piping, thereby shortening the life of the anodes.



### **Impressed Current Systems**

This type of cathodic protection is generally applied to single-wall, steel USTs for upgrading.

The tank, piping and other components such as dispenser pans can be cathodically protected by an impressed current system in which the protective current is provided through the use of a rectifier which converts AC current to DC current. Impressed current systems can produce much larger current and can protect even bare steel tanks. For this reason, impressed current systems are most commonly used as a retrofit on existing bare steel tanks.

An impressed current system requires the same structure-to-soil measurement as a galvanic system. Good operating practice includes inspecting and recording the voltage and amperage outputs of the rectifier every 60 days. (See Appendix G)



### **DISPENSER AREAS [ H&SC 25281.5 ]**

Under every dispenser, the piping has a shut-off valve with a fusible link and a shear joint. (This is a Uniform Fire Code requirement.) These valves are known as “shear valves,” “impact valves,” or “earthquake valves.”

The name says it all. If the dispenser is jarred, these valves are supposed to shut off the flow of product. If your agency’s policy allows hands-on inspections, you can check to see if the valve works by flicking it open and closed while a customer is pumping fuel. (Let the operator and the customer know what you’re doing!)

- Ask the operator to open all the panels on the front of the dispensers. They should be locked and the operator should know where the keys are. California Air Resources Board inspectors issue fines if keys are not available on site.

- Look for leaks from fittings and elbows while a customer is filling his tank. Strong vapors or stained soil indicate there's been leakage.
- Make sure any mechanical floats in secondary dispenser containment remain properly chained. (See Page 28)

**Dispenser calibration sticker** - At **retail stations**, dispenser meter inspections are done by the local Weights and Measures office. The inspector issues stickers to be placed on dispensers that pass inspection. If the meter readings are off, the dispenser is tagged and the owner must have it calibrated before using it again. If the operator is monitoring his UST using statistical inventory reconciliation and the meter readings are off, then the reconciliation will be, too.

Dispensers at **non-retail** facilities should be checked by a qualified device repair person if statistical inventory reconciliation is used.



## **EMERGENCY SHUT-OFF SWITCH** [ CCR 2632(d)(1) & 2711(a)(8) ]

The Uniform Fire Code requires every facility to have an electrical emergency shut-off switch. This electrical switch must be clearly labeled and installed within 25-75 feet of each dispenser. You can make sure the switch works properly by turning it on and off while someone dispenses fuel into a container or while a customer is pumping fuel. (Let the operator and the customer know what you're doing!)



## **FACILITY PLOT PLAN**

When an owner prepares an operating permit application, he must include a plot plan of the facility.

The diagram must include the location of the tanks and piping and any ancillary equipment. Ancillary equipment includes monitoring equipment and control panels, dispensers, overfill alarms, vent pipes, and fill pipes.

- Check the operating permit and attached monitoring program (monitoring, response, and plot plan). Are they up to date?



## **GROUND WATER MONITORING WELLS** [ CCR 2648, 2649 ]

Ground water monitoring detects the presence of product floating on the ground water. To ensure that the system is suitable for the site, an assessment is required at installation. Geologic logs must be prepared by a professional geologist or civil engineer [CCR 2649(b)(1)(D)]. Wells are installed at strategic locations in the ground near the tank and along the piping runs. They should be checked for the presence of free product by using a bailer at least every 30 days or by a permanent sensor that operates automatically and continuously.

- Check the distribution of the monitoring wells. Are there enough wells to monitor the tanks and piping adequately? If it looks like the well distribution is sparse, ask to see a copy of the facility site assessment used to determine the well locations.
- Check the monitoring records. If they look as if they were done all in one day, they probably were.
- If wells are partially paved over or locks are rusted shut, the wells are obviously not being sampled (a violation).
- Are the wells labeled clearly so that delivery truck drivers don't mistakenly use them as fill pipes?
- Are the wells constructed to prevent contamination from surface runoff and infiltration? Water accumulating around the well is a good sign that the well is sealed. Be sure to bail this water before you open the well.
- Check the well caps to see if they're tight enough to keep out surface runoff.
- Are the well caps secured to prevent tampering? If the caps are locked, is the key available to the person responsible for monitoring?
- All monitoring well piping should be slotted. To verify this, you can run a narrow stick with a nail at the end along the inside of the pipe. Does it feel like there are slots? If there are no slots, ground water (and free product) can't get into the pipe for monitoring.
- Check to make sure there is sufficient water in the well. An inch or two of water in the well is not much use for monitoring purposes. On the other hand, if the water level is higher than the slots in the pipe, you will not detect free product.
- Ask if sampling is done by using a bailer or an automatic device. Verify that the proper equipment is on site. Does the bailer look like it's so new that it's never been used? Ask the operator for a demonstration, if necessary.
- If sampling is done by bailer, check the log to verify that it's done at least weekly. If ground water monitoring is done automatically check the control box (usually on the inside office wall) to be sure the power light is on and no alarm is indicated.
- It's a good idea to have operators keep a log sheet next to the control box to record all alarms and the steps taken to clear them.



## **INTERSTITIAL MONITORS AND SUMP SENSORS (INCLUDING DISPENSER PAN SENSOR)**

[ CCR 2632(c)(2) ]

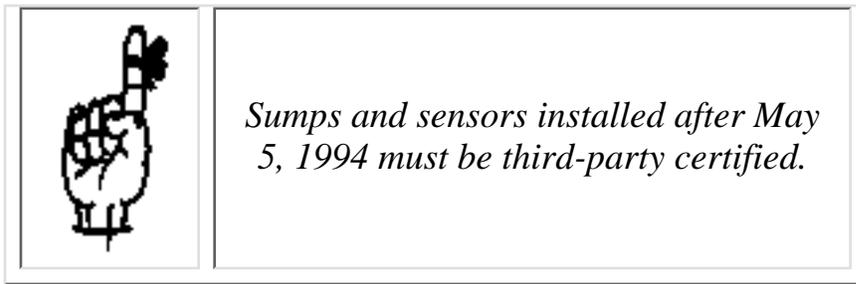
Interstitial monitoring is any monitoring method that checks for leaks in the space between the primary containment and the outer wall, or barrier. Product that leaks from the inner wall of double-wall piping goes into the interstitial space and gathers in the sump, where an alarm goes off. (See Appendix F for checklist)

- Check the monitoring box in the office to see if the power light is on and the alarm indicators are off. Look for access boxes for the probes in the vicinity of the tanks and the piping that are being monitored.
- To verify that double-walled piping is truly double-walled, check at both ends of the piping (pump sump end and dispenser end) to see if there are points where the piping increases substantially in size, or that piping and dispenser sumps are present.
- If the tank system has a liner with monitoring wells in the interstitial space (instead of a double-walled tank), follow the same verification steps for monitoring wells listed under “Ground Water Monitoring Wells”.
- Look in all the piping sumps and under all dispensers. Sensors must be free of debris, dirt, and corrosion. Sumps and dispenser pan should be water-tight and sensors should be dry. Is the sensor properly placed at the bottom of the low end of the sump or dispenser? If the sensor is set too high, leaked product could go undetected for a long time.
- If the sump sensor and dispenser pan sensor are the type that respond to liquid, you could take the sensor and dip it in hydrocarbon or water to see if the alarm triggers. If it is a float sensor, you can turn it upside down to trigger the alarm. Or you could dip it in a container of liquid (water or product) to see if the float moves up and triggers an alarm. There must be an audible and visual alarm. Be sure to return the sensor to its proper position.
- If the sump sensor shuts down the turbine when a release is detected or if the monitoring system fails or is disconnected, no further monitoring is required. For more information on monitoring requirements for double-walled piping see Table 11 of the UST guide on the website <http://www.swrcb.ca.gov/~cwphome/ust/>

Some interstitial sensors are difficult to replace properly after you remove them, so be careful. You always have the option of having a maintenance person check the sensor while you watch. You could also have the operator do it if he’s been trained and knows what he’s doing.

An alternative (a less reassuring one) to doing this yourself is to rely on annual certification records. Often, the panel on the wall or a computer printout can give you the status of sensors and alarm history. And, of course, you could always schedule a visit during annual certification checks.

- If you’re relying on records, you should still verify information by visually inspecting the sensor line to make sure it’s running into the interstitial area of the tank.



## **MAINTENANCE/CALIBRATION RECORDS** [ H&SC 25293, CCR 2712(d), CCR 2630(d) ]

Manufacturers of UST systems include recommended maintenance schedules in their operating manuals. These schedules must be maintained for five years from the date of installation.

All records of routine maintenance and calibration must be kept on site in the facility's files for at least three years.

- Check to see if the owner is having his monitoring equipment serviced according to manufacturer's instructions. Regardless of the manufacturer's schedule, check to make sure the equipment is functioning properly as required once per year.

The annual certification must be done by properly trained personnel. Some manufacturers certify their service people and recommend that only those people work on their systems.

Some local agency inspectors specify which maintenance companies may perform this type of work.

Some local agency inspectors require the annual check to be performed in their presence.



## **STATISTICAL INVENTORY RECONCILIATION (SIR)** [ CCR 2643(b)(3), 2646.1 ]

If the tank is monitored by statistical inventory reconciliation (SIR), the records should be on file. Inventory reconciliation records must be kept for three years. (See Appendix F for inspection checklist)

- Check to see if the operator is gathering data correctly (daily pump meter readings, deliveries, and product level). Are his calculations accurate? Is he checking for water daily? Is there a drop tube in the fill pipe?

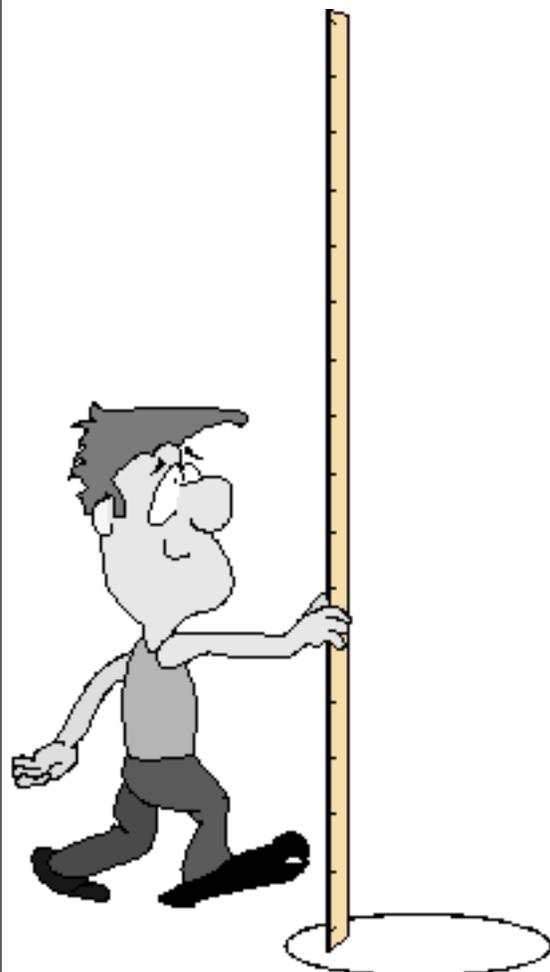
1. MIR is not allowed as a leak detection method (however, the operator may use it for

his own inventory control).

2. Review monthly SIR results. Any reported failure requires a tank and/or piping test. Appendix D contains suggested SIR reporting forms. As indicated on the forms, test results should be reported as, "pass," "fail," or "inconclusive"

Check to see if a tank integrity test has been performed within the last two years.

*See LGs 123-2, and 139-1 for more detailed information about SIR.*



### **DIPSTICKING**

- Have the operator give you a demonstration of his dipsticking technique.
- Does the dipstick have legible 1/8 inch markings? Is the bottom of the stick worn down?
- Does the operator take the average of two readings and record in 1/8 inch increments? Using a product-finding paste on the dipstick helps to see the product level.
- Does the operator use a tank calibration chart with 1/8 inch level conversions so the volume can be read directly from depth measurements? (The chart converts liquid level measurements into gallons.)
- What about water in the tank? Water should be measured every day. Ask the operator to stick the tank for water using a water-finding paste.
- Are the records of the operator's stick readings available for your inspection?



## **MANUAL TANK GAUGING**

Manual Tank Gauging should not be confused with Manual Inventory Reconciliation (MIR). MIR was a method that included daily stick readings which were used along with inputs and withdrawals to calculate a gain or loss on a monthly bases. This method is no

longer allowed.

The manual tank gauging method is done weekly after taking the tank out of service for a certain period of time. Liquid level readings (dipsticking) are taken at the beginning and ending of the test period and compared with each other to see if the tank is leaking.

- Tanks with a capacity up to and including 550 gallons may be monitored by this method alone.
- Tanks with a capacity of 551 gallons up to and including 1,000 gallons may be monitored by this method alone if the testing period is extended to 60 hours.
- Manual tank gauging may not be used on piping or on tanks with secondary containment.

See LG 137-1, “Weekly Manual Tank Gauging” (a booklet for the tank owner) for more information.

- Have the tank gauging readings (see dipsticking on page 32) been taken once a week and over a minimum 36-hour period?
- The tanks must be gauged twice and an average reading used in the calculations of liquid volume. Are all these readings recorded? Is there a tank chart calibrated in 1/8 inch increments?
- Check the calculated differences in tank level readings: Are the weekly as well as monthly average variations less than the allowable standards (Table 4.1 in Section 2645 of the UST regulations)? If any of these readings are more than the allowable standard, a leak is indicated.



## **MONITORING PROGRAM** [ H&SC 25293, CCR 2632(b),(d), 2641(h) ]

When the owner originally applied for an operating permit, his application included a written monitoring program.

The monitoring program consists of the

- Monitoring plan
- Response plan
- Plot plan

Each is required to be attached to or referenced in the operating permit. Referenced documents should be on-site and available to the facility employees.

- Check the records for the monitoring program. They should be with the operating permit.

See Appendix D for a sample monitoring program.



## OPERATING PERMITS

Owners of USTs must have a facility operating permit that covers all tanks on a site. The permit must be kept at the facility for the operating life of the tank(s). All permit conditions and attachments must be on site also. Some agencies require the permit to be posted.

- Check the owner's records for a copy of the operating permit. Does it look like the one in your records? Is it current or has it expired?
- Has anything been changed (monitoring equipment, type of fuel being stored, name of owner, etc.) that wasn't reported to you or approved by you?

See Appendix B for a sample permit showing the required UST related information.



## PIPING (LINE) LEAK DETECTION [ H&SC 25281.5, CCR 2636, 2643(c),(d),(e). 2666 ]

There are two main types of piping systems: pressurized and suction. (See Appendix F or inspection checklist)



## PRESSURIZED PIPING

Pressurized single-wall piping runs must have automatic line leak detection capable of detecting a release of 3.0 gph that shuts down the turbine if a release is detected or if the detector fails or becomes disconnected. In addition, there must be a visual and audible alarm. In addition to 3 gph, a monthly 0.2 gph or an annual 0.1 gph line test must also be performed.

- For each UST check for the presence of a line leak detector at the turbine head under the manhole cover. This is the same place where you would find a sensing device associated with a continuous alarm system. It should be on the turbine pump head or closely adjacent on the outlet piping of the pump. While you're there, check the soil

for signs of staining or contamination if there is no sump containment box.

- If the piping integrity test is performed by an electronic line leak detector, be sure to ask for a printout from the console to confirm that the tests are being performed.
- Is the line leak detector listed in LG 113?
- If the line leak detector is electronic, and if the panel on the wall has a printer, check the alarm history. Is the detector set up to shut off the pump in the event of a leak or if the system fails or is disconnected?
- Check the records to see if the line leak detector has been checked annually to verify proper operation. If the line leak detector is mechanical, review the annual certification to see if the tank tester or maintenance person tested it on-line without removing it from the turbine.
- If annual tightness testing (by a licensed tester) is used in conjunction with the line leak detector, check the piping tightness test results (see Tank and Piping Integrity Tests on page 46).
- If the (electronic line leak detector) is used to perform the 0.2 gph monthly or 0.1 gph annual test, verify that these tests were performed according to the monitoring plan. If there were any “fails,” determine whether proper action was taken.

Piping failure is the primary source of underground storage system releases.



## SUCTION PIPING

- Suction piping for some new systems includes a check valve under the dispenser pump (safe suction). While most check valves are readily visible, those encased in a union may not be. If there is a check valve under the dispenser, and no other check valve in the line, no additional leak detection is required.
- Check the suction pump in the dispenser for any signs of spillage or dripping, especially around the filter area. Also check the soil under the pump if there is no under dispenser pan for signs of staining or saturation.
- Check the records for piping tightness test results. On most old systems, the check valves were most often located over the top of the tank (angle check valve) or at the bottom of the suction pipe (foot valve). If this suction piping is single-walled, then tightness tests are required every three years.
- Tank owners are required to observe the suction piping system for evidence of leakage during dispensing. Is there a written log of these daily visual observations? (See Appendix I for a sample form.)
- Check if the suction is a safe suction system in compliance with Section 2636 (a)(3) of the UST regulations. If it is in compliance, then neither secondary containment nor monitoring is required; however, corrosion protection must be provided for steel piping.



## BOTH SUCTION AND PRESSURIZED PIPING SYSTEMS

- If groundwater monitoring or soil vapor monitoring is used, check to ensure that wells are placed along the piping run and around the dispenser.
- If there is double-wall piping, check to see how the outer wall of the piping is terminated at the dispenser and at the turbine sump. At the dispenser end, the piping will be single-walled at some point; look for some point where the piping increases substantially in size, or look for a pan under the dispenser. At the tank end, visually inspect the turbine sump. Look for secondary piping connections where the primary piping enters the sump.
- If a continuous monitoring method is used, check for sensors in the piping sumps or monitoring wells.
- Check for any signs of corrosion. Since the turbine head and leak detector are metal, they can corrode.
- Check to see that the test boots have been removed from the secondary piping in order to allow a possible release from the primary piping to drain into the sump.



Since December 22, 1998, line leak detectors on single-wall piping must shut off the flow of product - restricting the flow will not be adequate.

CCR  
2666(c)

For an in-depth look at line leak detectors, refer to Understanding Line Leak Detection Systems to be published soon by the SWRCB. Fax your request for a copy to: (916) 227-4349.



## REPAIR RECORDS [ CCR 2660(j), 2661 ]

If any part of an UST system has been repaired, the records must be retained for the operating life of the system.

The owner must let the local agency know how he plans to repair any part of his tank system and he must have the local agency's approval before beginning the repairs.

- Are repair records in the file? Did the owner obtain prior approval?



## **EMERGENCY RESPONSE PLAN [ CCR 2632, 2641(h) ]**

When the owner submitted an operating permit application, his response plan should have been included. The plan is part of the approved monitoring program and should be kept onsite with the permit (see Appendix D).

The main purpose of a response plan is to be prepared in case of emergencies (leaks, spills, and overfills). The response plan must identify the method and equipment to be used to remove and dispose of product. It also must include the name and title of the person who can authorize work to be done.

- Check the records to see if the response plan is there (it should be filed with the operating permit).
- Ask the operator and station attendant if they are familiar with the plan and what they would do in case of a leak, spill, or overfill. What they tell you should match the response plan.
- Does the response plan reference the use of absorbent material and rags to clean up small spills? Are these materials readily available and labeled or locked away? Is used material stored in disposal containers?



## **SPILL CONTAINMENT AND OVERFILL PREVENTION [ CCR 2635(b), 2665 ]**

### **Spill containment**

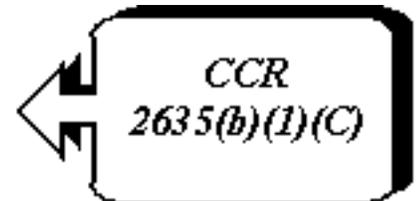
All USTs must be equipped with spill containment.

You're going to see several manhole covers in the pavement at service stations. One of them will be covering a fill pipe that must have a spill container.

Some station owners have identified manholes by painting marks on the covers. This helps when you're conducting an inspection. But if the covers aren't marked, the facility plot plan should identify fill pipe locations. If not, keep looking until you find all the right ones.

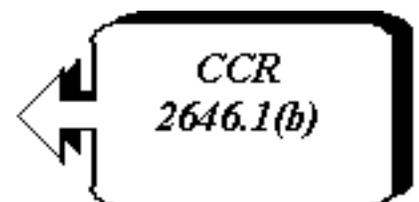


- Once you've located all the fill pipes, check to see if there is a spill container at each one. If you can see dirt around the fill pipe there's no spill containment.
- Is the spill container empty or does it have water, product, or debris in it? The spill container will not be effective if it's allowed to sit there full.
- You may see fuel around the fill pipe if the person delivering the product has been sloppy. Without spill or overfill protection, a significant amount of fuel could build up around the tank. You may want to require sampling upon installation of the overfill prevention device, or note this for future reference on the inspection report.
- Is the spill container capable of holding a minimum of five gallons of product?
- Is there a drain valve in the spill container and does it function properly? If there's no drain valve, there must be either a pump installed in the spill container or a manual pump on site. Drain valves should not be left open during delivery because harmful vapors can be emitted.
- Is there a drop tube? Drop tubes reduce vapors and static electricity and help keep dipsticks vertical for accurate product measurements.



The California Air Resources Board and/or the local Air Quality Management district require drop tubes in tanks storing gasoline and they allow only drop tubes that are certified by the Air Resources Board.

The SWRCB regulations require drop tubes if the tank owner uses statistical inventory reconciliation for leak detection.



### **Overfill prevention**

All USTs must be equipped with an overfill prevention system.

- Check to see if there's an overfill prevention system for all the USTs. If there is not, the facility is out of compliance.

There are three types of overfill prevention:

### **Audible and visible alarm**

High level alarms are typically connected to the automatic tank gauge and are set to alert the operator by triggering an audible and visual alarm.

- Check to see if the alarm is where the delivery driver and operator can see and hear it.

### **Ball float valve or float vent valve**

Usually, you'll know if the system has a ball float valve because there will be an extractor fitting inside an access port in the ground. A ball float valve will restrict the flow of product into the tank.

- Look for it opposite the fill pipe.

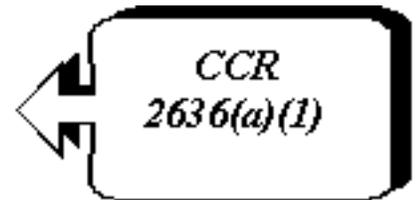
Ball float valves should not be used on suction piping systems, pressurized deliveries, loose fill connectors and spill containers in drain valves, or coaxial Stage I vapor recovery.

### **Automatic shut-off device**

- Look down the fill pipe with your (explosion-proof) flashlight. You should be able to see a small restriction in the fill pipe. If you don't see the restriction, there is probably no automatic shut-off device.

See LG 150, Ball Float Vent Valve vs. Fill Tube Positive Shutoff Valve, for more information on overfill prevention.

- Secondary containment for fill risers is not needed if there is an automatic shut off device installed or the combination of a ball float valve (restricting the flow) and audible and visible alarm is used in accordance with Section 2635(b). Currently, there is no device or combination of devices that will exempt waste oil tank risers from secondary containment.



## **SPILL/LEAK REPORTS [ CCR 2651, 2652 ]**

If the facility has had any reportable unauthorized releases, the information should be in your files. And because you reviewed the file before the inspection, you know whether you were given accurate information by comparing what you have in file to what the facility files show.

Released product that stays inside the secondary containment (sumps and spill containers) and is removed within 8 hours must be recorded, but it does not have to be reported. However, other releases at dispensers, turbines, and fill pipes must be reported and

investigated immediately - especially if the release reaches the environment. Dirty soil or smells at turbine heads, leaking dispensers, or standing liquid in spill containers and sumps often indicate reportable releases.

- Do the files contain reports of spills?
- If there was a spill, what caused it? What action did the operator take?
- If absorbent material was used, how was it disposed of?
- Were any repairs required?



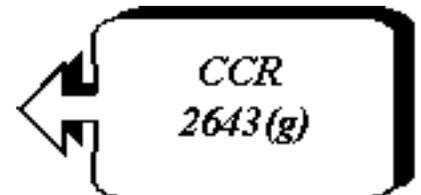
## TANK AND PIPING INTEGRITY TESTS

The time to review tank test reports is when you receive them. This has two advantages: 1) If the report indicates a failed test, you can make sure proper follow-up action is taken immediately; 2) If the test report is deficient, or the test was not properly conducted, you can require a retest. If you are not checking tank test reports as you receive them from tank owners, it is important to spend time on them during your inspection.

Tank owners are required to give you 48-hours advance notice before having their tanks tested unless you have waived this notification requirement. You may want to take advantage of this 48-hour notice to be present for the tank test. Owners are required to submit their test results to your agency within 30 days.

Items to check for in a tank and piping test report (having LGs 105 and 113 with you would come in handy here):

- Check to see if the tester has a current license (LG 105).
- Check for the tester's signature and license number on the report.
- Is the type of test equipment used listed in the report?
- Is the tester certified by the manufacturer to use the equipment (LG 105)?
- Is the calculated leak rate less than the testing equipment's leak threshold (LG 113)? (If the calculated leak rate exceeds the threshold, the test result is "fail.")



- Did the tank tester wait the appropriate amount of time to begin the test after fuel delivery/dispensing?
- Was the test run for the right length of time and did the tester take the proper number of readings?
- Was there any dispensing during the test?



### **FOR THE TANK TEST PART OF THE REPORT:**

- Was the size of the tank consistent with the specifications for the test equipment (LG 113)?
- Were the tanks manifolded? If yes, were the tanks isolated for the test or were they tested together?
- Was the in-tank water measured and reported at the beginning and end of the test?
- Did the tester determine and record depth to water table in the tank backfill?
- Did the tester compensate for the presence of water in the backfill (LG 113)?
- Was the product level in the tank during the test consistent with LG 113?
- Was the proper amount of pressure or vacuum applied to the tank (applies to nonvolumetric and ullage tests)?



### **FOR THE PIPING TEST PART OF THE REPORT:**

- Does the report specify the type of piping (suction, pressurized, or gravity flow)?
- Was the piping pressurized for the test? What was the pressure?
- Was the mechanical line leak detector removed to perform the test?
- Was the piping volume consistent with the specifications for the test?



### **THIRD-PARTY EVALUATIONS [ CCR 2712(b), 2643(f) ]**

The regulations refer to third-party evaluations as “performance claims” and ”performance standards.”

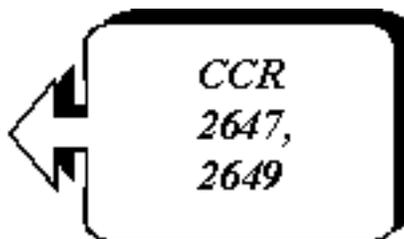
- Check to see that third-party evaluations for any monitoring equipment (including interstitial monitoring equipment and piping test equipment) are in file. They must be kept for 5 years.
- Check to see that the equipment used is proper for the operating conditions of the facility and the size of the tank.

Any equipment or method that has been third-party certified and reviewed for compliance with EPA's requirements is listed in LG 113.



## VAPOR OR VADOSE ZONE MONITORING WELLS

Vapor monitoring uses monitoring wells in the backfill around the tank and piping to sense product vapors which may indicate a leak.



Vapor monitoring must be conducted continuously. Other vadose zone monitoring must be conducted at least weekly.

- Unlike ground water monitoring wells, vadose zone wells should not have water in them and should not extend into the water table. Check to see that sensors in the wells are not submerged in ground water.
- Check the monitoring box on the inside wall of the office to make sure the power light is on and the alarm light is off. Is the automatic system working? Has it been tampered with to adjust alarm levels? Some hands-on inspectors like to use a portable sniffer to check for vapor.>

Vapor monitoring works with volatile substances only; it rarely work on diesel and should not be used on waste oil tanks.

