State of Alaska
Department of Environmental Conservation

Underground Storage Tank Operation and Maintenance Manual

Requirements, Recommendations and Practical Advice
for
Owners and Operators
First Edition – March 2000

Keep this document at:

Facility: _____
Owner: _____
Facility ID: _____
Location: _____
City: _____

Report all known and suspected releases immediately
Call 1-800-478-9300

Underground Storage Tank

Operation and Maintenance

Manual

Requirements, Recommendations
& Practical Advice
for
Owners and Operators

First Edition

State of Alaska
Department of Environmental Conservation
Storage Tank Program

March 2000

Before you read this manual . . .

This manual is designed to help owners and operators understand and organize the routine requirements necessary to operate and maintain underground storage tank systems. In order for you to get the most out this manual, we suggest the following:

- ## Read this manual slowly.

There is a lot of information provided in this manual. Do not try to read the entire manual at once. There is too much information for someone to understand all the requirements in one reading. We suggest you read one section at a time and take a break in between sections.

- ## Answer the questions after each chapter.

This manual is also designed to be a workbook to quiz owners and operators on equipment status and compliance requirements. At the end of each chapter we have provided some questions that you should answer to see whether or not you understand the important points of each chapter.

- ## Not every page applies to you.

There are many different types of underground storage tank (UST) systems in Alaska. The exact operation and maintenance requirements can vary from tank to tank, depending on the type, construction and age of the UST system. We have created a manual that describes every type of system, so you only need to understand the sections that apply to you.

- ## Questions? Call us.

You can always contact us if you have any questions about this manual. . See Chapter 10 for different ways to contact us.

Contents

Tables/Checklists

Chapter 1. Introduction

A. Why an "O & M" Manual

This manual was developed to help owners and operators of Underground Storage Tank (UST) systems understand and organize all of the operation and maintenance requirements that need to be done on a routine basis.

The passing of the December 22, 1998 deadline gave a number of people in the UST community the impression that the work to meet compliance was essentially over. Many thought that a recently installed or upgraded UST would provide a problem-free future for UST systems in Alaska.

But the work is far from over. While owners and operators throughout Alaska spent the last 10 years achieving compliance, many have not considered how to maintain compliance. Many Owners and Operators are unaware of the annually, monthly and even daily requirements needed to run a UST system that is free of leaks, overfills, and rust. Without routine maintenance for identifying and correcting problems, it may only be a matter of time before your UST fails.

This manual was designed to help meet the challenge of maintaining compliance. We have organized all of the long-term requirements into a simple, easy to read booklet.

B. Benefits of Using This Manual

- Identify the things you must do on a routine basis to make sure your UST is functioning properly.
- Organize and put in one place a series of checklists with all of your Operations and Maintenance (O&M) duties.
- Train yourself and your staff on how to effectively operate and maintain your UST.
- Save time, money, and resources by being an informed UST owner or operator.
- Discover small problems before they turn into large ones.
- Prepare for your third-party inspection.
- Protect your investment by extending the life of your UST system using preventative maintenance.
- Avoid fines, penalties, and enforcement action.

C. Who Should Read This Manual?

- UST owners and operators.
- Any UST-facility employees who use or manage USTs.
- People who are considering the purchase or installation of an UST.

D. Who Has Read This Manual?

The Alaska Department of Environmental Conservation (ADEC) suggests that you and your staff read this manual cover to cover and sign off below. This will help you keep track of who has read the material.

I have read the ADEC UST Operation and Maintenance Manual and understand the basic of UST operation and maintenance

Name	Signature	Title	Date
Name	Signature	Title	Date
Name	Signature	Title	Date
Name	Signature	Title	Date
Name	Signature	Title	Date
Name	Signature	Title	Date
Name	Signature	Title	Date
Name	Signature	Title	Date

Make sure all of your staff read this manual!

E. How to Use This Manual

- **Facility Summary.** After you finish the introductory chapter, proceed to Chapter 2 and fill out all the information about your particular UST facility. This will help prepare you for understanding which of the other chapters apply to your situation.

- **Read Each Chapter.** Carefully read each of the following chapters, that apply to you. Make sure to answer the questions at the end of each chapter.

- **Notes/Problems/Questions**. At the end of each chapter, make a list of things questions or concerns you have. Then contact ADEC for assistance (see Chapter 10 for details).

- **Emergency Information.** Chapter 4 deals with what to do when you have a known or suspected release of petroleum. Fill out the Emergency Contact page and post it at the UST facility where staff can easily see it.

- **Annual Review.** Have you and your staff review this manual once a year.

- **Helpful Symbols:** Look for these codes to help you find good tips, ideas and interesting stories.

Checklists. Fill these out.

Deadlines/schedules/reminders. Check your calendar.

Real-life Alaska stories about improper or unsafe tanks and piping.

Good ideas! It's not required, but it is a good idea.

Chapter 2. Getting Started - How Your UST System Works

Before you learn about your specific Operation and Maintenance (O&M) requirements, you need to know what type of UST system you have. Use this chapter to document the three major areas of prevention equipment at your UST system: release detection, spill and overfill prevention and corrosion protection. Once you are sure you know what you have, then read and answer the questions on all the following pages that apply.

"You Mean I Didn't Need to Pull the Tanks?"

In the summer of 1999, under a state enforcement agreement, a tank owner removed what he thought was a substandard UST system. During closure, he discovered that the tanks met the 1998 deadline standards. He could have avoided the expense of replacing three USTs and piping, plus the cost of penalties and loss of revenue during down-time, had he only known what type of system he had buried beneath the ground.

Please feel free to make copies of the Tables and Checklists in this chapter, and throughout the manual, as you need them.

A. Proper Equipment Checklist (Table 2a)

Use Table 2a (page 6-7) as a starting point to see if you have the right equipment. Take a few minutes and place a check beside the correct equipment for each tank that you have at your UST facility.

If you are not sure about your equipment, or how to complete the checklists, **don't guess**. Call ADEC for assistance at 1-800-478-4974 and we will help you figure it out.

Table 2a - Equipment Checklist

Complete Sections 1, 2, 3, 4

1. General Facility Information

Complete the following information:

Facility Name _____

ADEC ID # _____

Number of Active Regulated USTs: _____

2. Release Detection

A. Release Detection for Tanks

Release Detection is not required for emergency power generator & heating oil/emergency generator UST systems

Check at least one for each tank:	Also see page:	Tank #1	Tank #2	Tank #3
Automatic Tank Gauge	10-11			
Interstitial Monitoring (double wall)	10			
Statistical Inventory Reconciliation (SIR)	11			
Inventory Control & Tank Tightness Testing(TTT)*	13			
Manual Tank Gauging Only **	13			
Manual Tank Gauging and Tank Tightness Testing***	13			

* Only allowed for 10 years after upgrading of tank (not piping) with cathodic protection. TTT required every 5 years.

** Only allowed for tanks of 1000 gallon capacity or less and only for 10 years after upgrading tank with cathodic protection.

***Only allowed for tanks of 1001 to 2000 gallon capacity and only for 10 years after upgrading tank with cathodic protection.

B. Release Detection for Pressurized Piping

Check at least one from A & B for each tank:		Also see page:	Tank #1	Tank #2	Tank #3
A	Automatic Flow Restrictor or Shut-off Device	14			
	High Level Alarm	14			
B	Annual Line Tightness Test	15			
	Statistical Inventory Reconciliation (SIR)	11			
	Interstitial Monitoring (double wall)	10			

C. Release Detection for Suction Piping

Check at least one for each tank:	Also see page:	Tank #1	Tank #2	Tank #3
Line Tightness Testing Every Three Years	15			
No Release Detection Required*	15			

*Only if system has:

1) Only one check valve per line located directly below the dispenser;

2) Piping sloping back to the tank; and

3) System must operate under atmospheric pressure

Table 2a - Equipment Checklist- continued

3. Spill and Overfill

Spill and Overfill Prevention (Not required if tank receives less than 25 gallons per delivery)

Check for each tank:	Also see page:	Tank #1	Tank #2	Tank #3
Spill Catchment Basin*	23			
Check at least one for each tank:				
Automatic Shutoff Device on Fill Pipe	25			
Overfill Alarm at Console	25			
Ball Float Valve at Vent Pipe or Vapor Return Line	25			
Flow Restrictor on Fill Pipe	25			

4. Corrosion Protection

A. Corrosion Protection for Tanks

Check at least one for each tank:	Also see page:	Tank #1	Tank #2	Tank #3
Steel tank with Corrosion Resistant Coating and Cathodic Protection	29-31			
Tank Constructed of Non-corrodible Material	NA			
Steel Tank with Factory Clad Fiberglass Coating	NA			
Cathodically Protected Steel (pre 1988 only)	29-31			
Internally Lined Tank	32			

B. Corrosion Protection for Piping

Check at least one for each:	Also see page:	Tank #1	Tank #2	Tank #3
Corrosion Resistant Coating & Cathodic Protection	29-31			
Non-corrodible Material	NA			
Cathodically Protected Steel (pre-1988 piping only)	29-31			

B. How Did I Do?

Did you have any questions or problems with the inspection, maintenance or operation of tanks and piping at your facility? Make a list of you questions in the "Notes" sections (next page) or on the checklists. Then call ADEC for solutions - -see Chapter 10 for a list of contact numbers.

C. Notes/Problems/Questions

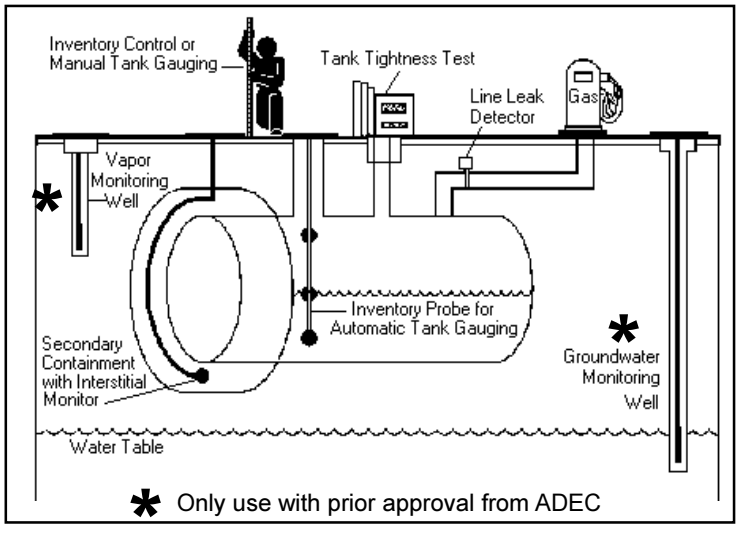
Chapter 3. Release Detection

A. Did You Know . .

- For most systems, release detection must be done on both tank and piping every day the system is in operation.
- If your method inolves taking product inventory measurements, simply measuring fuel levels is not enough. You must reconcile the measurements every 30 days. Think of "reconciliation" as balancing your checkbook ledger each month.
- Unless you can prove your tanks and piping are not leaking at least every 30 days, you are not doing release detection.
- Every form of release detection has its limits and all are subject to failure.
- No one method of release detection gives you 100% assurance on whether or not your system is leaking. But, the law requires at least 95% assurance.
- Doing release detection can be complicated. You should take the time to understand your release detection method.
- A release detection system, like any electronic or mechanical system, is subject to wear, tear, and failure.
- Release detection is not required for emergency power USTs and combination emergency power/heating oil USTs. “Heating oil only” USTs are not regulated
- Tanks with no piping (i.e. waste oil tanks with only fill and vent pipes) do not need release detection for piping.

Release Detection

This diagram shows most of the major methods of release detection for tanks and piping!



B. Tanks: Release Detection

1. Release Detection Methods for Most Tanks - Table 3a

Select the type of release detection you use on your tank from Table 3a (pages 10-11) and then see if you can answer all of the questions that apply to you. Circle yes or no for each section that applies. Use the blank boxes to note any problems or questions.

Table 3a - Release Detection for Most Tanks

(Answer each question that applies with a Yes or No)

1. Interstital Monitoring/Double Walled Tanks

Interstitial monitoring is a method of release detection used for double walled tanks.		NOTES:
Y / N	**Do you check your interstitial space every 30 days?** Unless you are checking or testing the interstitial space every 30 days, simply having a double walled tank or piping is not enough.	
Y / N	**Do you keep a log book of the interstitial space readings? Do you know where it is?** If you are manually checking the interstitial space, you must keep a log of the test results.	
Y / N	**Do you save your print-outs each month?** If you have an electronic sensor between the inner and outer tank walls, you need to make sure you keep a printed readout of each test.	
Y / N	**Do you test your probes according to the manufacturer's specifications?** Sensor probes do fail periodically. Be sure your sensor is tested per manufacturer's specifications.	

2. Automatic Tank Gauging (ATG) Systems

This method uses authomated processes to monitor product level & inventory control.		NOTES:
Y / N	**Does your ATG test for leaks every 30 days? Do you save your ATG printouts?** Unless you are keeping records of actual release detection results every 30 days, you are not doing leak detection right. You are in effect not doing release detection at all. Save ATG printouts for the past 12 months.	
Y / N	**Is your ATG approved by a third party vendor?** Your ATG must be tested and approved by a third party who can verify the performance of the device. Often the approval is in the last chapter of your ATG Manual. If you can't find it, have the manufacturer provide you with the third party approval. The best place to confirm the approval of the equipment is the National Leak Detection Workgroup Evaluations. If you can't find it, have the manufacturer provide you with the third party approval. Keep a copy in your files.	
Y / N	**Have you talked to your ATG vendor in the last few years and are you sure they are still available for service?** If you have an automatic tank gauge system installed in the late 1980's or early 1990's, you may find that some of the manufacturers may not be in business any more.	

Table 3a - Release Detection for Most Tanks- continued

Y / N	**Is your ATG still servicable?** If you cannot service your ATG because the manufacturer is no longer in business, you cannot use that particular ATG. You must install a new one.	
Y / N	**Is your ATG system working properly?** Automatic tank gauges can give a tank owner a false sense of security. Owners assume that the sytem will work forever. Most ATGs have a "test" or "self-diagnosis mode". Read your manual, run the test, and see if your ATG is working properly. A good practice is to manually stick the tanks periodically to verify ATG readings.	
Y / N	**Have you read through your ATG manual in the last year?** If you have never read your ATG manual, you stand a good chance of doing release detection wrong.	
3. Statistical Inventory Reconciliation (SIR)		
In this method of release detection, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data.		NOTES:
Y / N	**Is the SIR Method you use approved by a third party?** The company that performs your SIR assessment must be approved by a third party. (Ask the vendor about their National Leak Detection Workgroup Evaluations). Have the company prove to you that they are approved.	
Y / N	**Has you SIR vendor assured you in writing that their method can be used for piping?** If you do SIR for piping as well as tanks, the method you use must be approved for piping. Not all SIR vendors are approved for piping.	
Y / N	**If you have manifold tanks, is your SIR vendor approved to assess manifolded tanks?** Not all vendors are. If not, select another vendor or use another type of release detection.	
Y / N	**If you receive an "inconclusive" result, have you worked with the SIR vendor to correct the problem?** If you receive two "inconclusive" results in a row, you must notify ADEC of a suspected release.	
↓		
Y / N	**IMPORTANT: If you receive a "failed" result, have you notified ADEC of a suspected release?** You must do this.	

SIR: READ THE FINE PRINT

Monthly reports created by SIR vendors often list important ideas about collecting and interpreting release detection data. If an owner is not collecting inventory data, the monthly report will provide suggestions. Do not ignore them!

Bad data collection can hide an on-going leak.

The Problem with ATGs

The most common violation ADEC finds at UST sites is not the absence of an automatic tank gauge, but the failure to use it properly. Many tank owners do not know about, or use, monthly reconciliation. What good is a checkbook ledger if you don't know how much is in you checking account? That same logic applies to your tank. Guessing can hide evidence of a leak!

2. Release Detection for Special Tanks- Table 3b

If you have a smaller tank, or one which can use Inventory Control, see Table 3b (page 13).

- **Inventory Control and Tank Tightness Testing**

  This method is only allowed on certain types of UST systems. Most tank owners had to stop using this method on 12/22/98. You can only use this method for 10 years after your tank was upgraded with cathodic protection. If you do use this method, make sure you can answer "yes" to the questions in Table 3b, Section 1 (page 13).

- **Manual Tank Gauging**

  Manual Tank Gauging (MTG) is only allowed on certain types of UST systems. You must meet all of the following conditions in order to use this method of release detection:

  - Tank is 2,000 gallons or less;
  - Tank has spill, overfill and corrosion protection; and,
  - Tank was installed prior to 12/22/98.

If you use MTG, make sure you can answer "yes" to all of the questions in Table 3b, Section 2 (page 13).

Table 3b - Special Tanks

The two methods, listed below, can only be used on certain tanks, and under certain conditions. See Section B2 (page 16) for additional information.

Section 1 - Inventory Control and Tank Tightness Testing		
(Answer each question that applies with a Yes or No)		
Y / N	Do you take inventory measurements and enter the numbers into a log each day the tank is in use?	NOTES:
Y / N	Do you use a State or Federal Inventory Reconciliation form? (Note: An inventory Control Form is available at the end of Chapter 3)	
Y / N	Do you reconcile your records each 30 days?	
Y / N	Do you conduct a tank tightness test every five years after the date of upgrade or installation?	
Y / N	Do you keep records of inventory control and tank tighness test results in case an inspector asks for them?	
Y / N	Do you analyse inventory control sheets each month to determine whether or not your tanks are leaking?	
Y / N	Do you test for water once a month with water indicator paste, and list results on the reconcilliation sheet?	
Y / N	Can your stick measure to 1/8"?	
Y / N	Do you have an accurate tank chart?	

Section 2 - Manual Tank Gauging (MTG)		
Y / N	Do you take inventory measurements weekly and enter the numbers in a log book?	NOTES:
Y / N	Do you use a State or Federal Manual Tank Gauging form? (Note: A Manual Tank Gauging Form is available at the end of Chapter 3)	
Y / N	Do you reconcile your records each 30 days?	
Y / N	Do you conduct a tank tightness test every five years after the date of upgrade or installation (only for tanks between 1,001 and 2,000 gallons)?	
Y / N	Do you keep records for your manual tank gauging and tank tightness test results in case an inspector asks for them?	
Y / N	Do you analyse your manual tank gauging sheets each month to determine whether or not your tanks are leaking?	

C. Piping - Release Detection

There are two types of piping: pressurized and suction. The requirements for each are different.

1. Pressurized Piping (Table 3c)

Use the combination of Section A and B on Table 3c (page 14-15) to evaluate whether you are doing release detection properly on your pressurized piping.

Table 3c - Pressurized Piping

Section A

If You Have:	☑	Make Sure You:
Automatic Shut-Off Device (Mechanical or electronic device that shuts off fuel if a drop in pressure is detected)		Annually test your device and confirm it is operational.
		Have the unit serviced (suggest annually)
Automatic Flow Restrictor (Mechanical or electronic device that slows down fuel if a drop in pressure is detected)		Annually test your device and confirm it is operational
		Have the unit serviced (preferably annually)
Continuous High Level Alarm (Loud alarm sounds if pressure drops)		Annually test your alarm
		Do not ignore alarm if it goes off
		Do not disconnect the alarm

Section B

If you do this:	☑	Make Sure You:
Annual Line Tighness Test		Hire a currently certified UST tank tightness tester and do line tightness test
		Keep records of results
Interstitial Monitoring (double wall)		See requirements under tanks above in Table 3a, Section 1
Statistical Inventory Reconciliation		See requirements under tanks above in Table 3a, Section 3

2. Suction Piping (Table 3d)

Certain types of suction systems do not need release detection. Use Table 3c (page 22) to see what requirements you need for operation and maintenance of release detection. Check all boxes that apply.

Table 3d - Suction Piping		
No release detection required if:	Y / N	Piping slopes back to tank
	Y / N	Piping has only one check valve that is located beneath the pump at the dispenser
If you cannot answer yes to both boxes above, then these are your options:		
Choose one of the release detection methods:	☑	Make Sure You:
Line Tightness Testing (every 3 years)		Hire a currently certified UST tank tighness tester and do line tighness testing
		Keep a record of the results
Interstitial Monitoring (double wall)		See requirements under tanks in Table 3a, Section 1
Statistical Inventory Reconciliation		See Requirements in Table 3a, Section 3

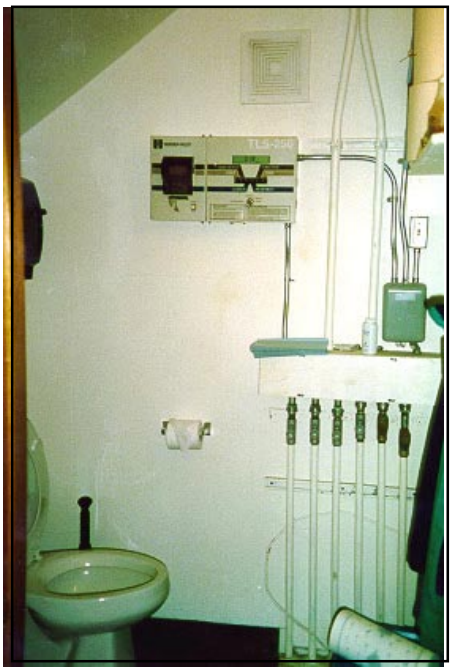
Leak detection for piping is particularly important because most leaks come from a UST's piping.

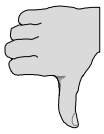
☑	What to do if your line leak detection alarm goes off?
	Treat the event as if you have a release of petroleum.
	Do not ignore and do not shut off the alarm without first investigating the system.
	Check your pipe sump for the presence of petroleum.
	Shut down the UST system until you can determine if a release actually occurred.
	Follow spill response and reporting requirements found in Chapter 4: If You Suspect a Release.

D. How Did I Do?

Yes	No	
☐	☐	Were you able to answer all of the questions in this Section?
☐	☐	Did you have any questions about the type of equipment you have or the way to maintain it?
☐	☐	Do you feel confident that you have adequate release detection on both your tank and your piping?
☐	☐	Make a list below of any deficiences, questions or problems and be sure to contact ADEC for further information. Call 1-800-478-4974 (in Alaska only).

E. Release Detection Notes/Problems/Questions





This is an automatic tank gauge console in the restroom of a service station. The console is unsecured and could be tampered with by the public.

And what if the alarm goes off when someone is using the restroom?

Chapter 4. If You Suspect a Release

A. If You Know or Suspect a Release:

Quick Checklist

- ☐ **Act:** Take immediate action to prevent further releases. Empty tank if necessary. You may need to call your distributor for assistance.
- ☐ **Prevent:** Identify and stop any fire, explosion or vapor hazard.
- ☐ **Report:** Contact the nearest ADEC office.

B. If You Observe the Following Conditions, You Must Report a Suspected Release:

- Presence of free product (liquid petroleum); soil contamination; surface or groundwater contamination; or petroleum vapors in sewer, basement, or utility lines,
- Erratic behavior of the dispenser,
- Unexplained water in the tank or piping,
- Sudden loss of petroleum,
- Results from your release detection system show a release, or
- Two consecutive months of "inconclusive" results from SIR.

You do not need to report a release if*:*

- A monitoring device is found to be defective and is immediately repaired, calibrated, or replaced, **and;**
- Additional monitoring does not confirm the initial result of a release.

C. Who to Contact in the Event of a Release

ADEC Contacts

Anchorage	907-269-3063
Fairbanks	907-451-2121
Juneau	907-465

Outside normal business hours:
1-800-478-9300

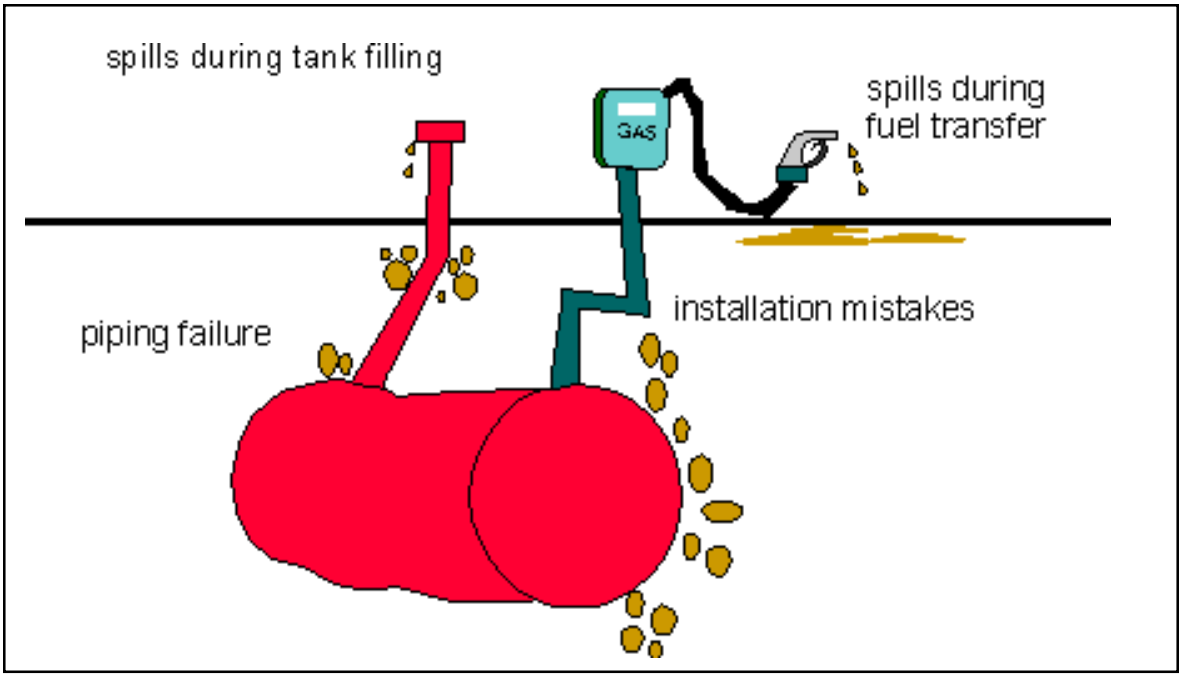
Copy this page and hang it in an area where you and your staff can see it!!!

What to Report and When

What you discover	When you must report to ADEC
Any release of 55 gallons or greater	Immediately
Below ground release of any amount	Within 24 hours
Above ground release to land between 10 and 55 gallons	Within 24 hours
Above ground release to waters of the State that cause sheen	Within 24 hours
Above ground release of less than 10 gallons	Within 7 days
Any unusual operating conditions: ■ the presence of free product (liquid petroleum); soil contamination; surface or groundwater contamination; or petroleum vapors in sewer, basement, or utility lines. ■ erratic behavior of the dispenser ■ sudden loss of petroleum ■ unexplained water in the tank or piping	Within 7 days
Any release detection results that indicate a release may have occurred	Within 7 days

When in doubt, play it safe and report suspected spills immediately!

Where Releases Occur



D. How Did I Do?

- ☐ Do I know what types of conditions indicate a suspected release?
- ☐ Do I know what to do and who to contact if a release occurs?

E. Emergency Contact Number

(Please complete the following information, and keep it readily available at your facility):

Emergency Contact

Name: _____ **Title:** _____

Company: _____

Phone #: _____ **Emergency #:** _____

Cell phone#: _____ **Fax #:** _____

F. Suspected Release Notes/Problems/Questions

_____

_____

_____

_____

_____

_____

Ignorance is Not Bliss

A tank owner in south central Alaska received two consecutive months worth of failed SIR data. The tank also had a irregular history of SIR reports with a number of "inconclusive" test results. After gasoline started oozing out of a crack in the pavement next to the tanks, the owner finally realized there was a big problem.

Chapter 5. Proper Spill & Overfill Management

Spill vs Overfill: What's the Difference?

- **Spill device:** Small spill bucket meant to catch small drips or spills during delivery.
- **Overfill device:** Equipment designed to prevent the filling of a UST beyond 90-95% capacity so that no fuel is spilled onto the ground during delivery.

A. Correct Filling Practices

Many releases at UST sites come from spills. Spills often occur at the fill pipe when the delivery truck's hose is disconnected. Although these spills are usually small, repeated small releases can cause big environmental problems (see the table below) . These mistakes can be avoided if the owner/operator and delivery driver follow standard tank filling practices. Complete the checklist in Table 5a (page 22) before, during, and after fuel delivery.

How much petroleum can leak out of a tank?

	GALLONS of oil leaked per year	TONS of contaminated soil created per year
One Drop every 10 seconds	40	150
Two Drops every 10 seconds	80	300
One Drop every 1 second	400	1,500
Three Drops every 1 second	1,200	4,500
Oil stream that breaks into drops	8,600	32,000

Remember:
Your tank should never be more than 90-95% full.

Table 5a - What to Do Before, During and After Delivery of Fuel

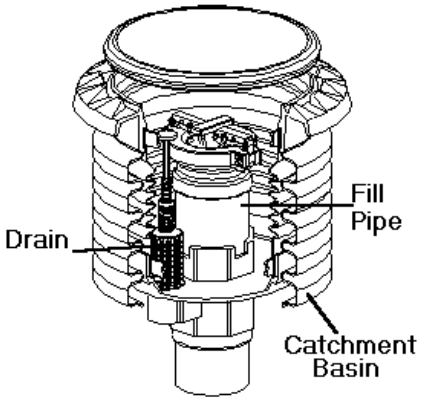
What to do before, during and after fuel delivery:	
☑	**Do all of the following:**
BEFORE	
	Order only the quantity of fuel that will fit in the tank. (Tank should only be 90% full). Example: 10,000 gallon tank minus 2000 gallons already in tank minus 1000 gallons ullage equals 7000 gallon delivery.
	Pre-arrange fuel deliveries so staff is present.
	Keep all fill ports locked.
	Verify that flow restrictor/high level alarm, automatic shutoff, or other overfill prevention device is functional.
	Create a label to tell the delibery person what type of overfill device is present and explain what to do if it activates.
	Make sure the high-level alarm is located where the delivery person can see or hear it.
	Verify spill containment bucket is functional and clean. Remove water, close shutoff valve and check for adequate capacity.
	Ensure that No Smoking signs are properly posted.
	Have oil spill sorbent pads available at the time of fuel deliveries.
	Where possible, request metered fuel drops.
	Ensure that containment sump is clean and dry prior to delivery.
	Keep fill ports locked until driver requests access.
	Have a tank capacity chart available for the delivery person.
DURING	
	The driver should make all hook-ups. The driver and facility personnel assigned to observe should stand by during the entire product delivery and be prepared to stop flow from the truck should any unusual conditions, leaks or spills be observed.
	Provide adequate lighting and safety barriers around the fueling zone.
	In the event of any spills or leaks, the driver will be responsible for stopping flow from the truck and the observer will notify the facility managers.
AFTER	
	Verify fuel drops using either manual methods (i.e., stick with water paste) or in-tank gauging before and after delivery.
	Following completion of the delivery,the driver is to be responsible for disconnecting all hook-ups.
	After fuel delivery, make sure fill ports are properly padlocked.
	Ensure sump is free of product.

B. Spill Protection: The Spill Bucket

Most USTs must have catchment basins to contain spills. Catchment basins are also called “spill containment manholes” or “spill buckets.”

1. Basics:

- A catchment basin is a bucket sealed around the fill pipe.
- The basin should be large enough to contain product that may spill when the delivery hose is un-coupled from the fill pipe.
- Basins range in size from those capable of holding only a few gallons to those that are much larger—the larger the catchment basin, the more spill protection it provides.



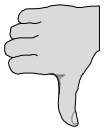
Catchment Basin

2. Keeping it Clean:

- Remove liquid from the catchment basin.
- Keep clean and free of debris.
- Manufacturer’s equip catchment basins with either a pump or drain to remove liquid.
- You should try to keep water out of the catchment basin.
- Some catchment basins can collect enough water and sediment, along with spilled product, to make draining this mixture into the tank unwise.

When DON'T You Need a Spill Bucket Device?

If a UST never receives more than 25 gallons at a time, the UST does not have to meet the spill protection requirements. Many small used oil tanks fall into this category. If you are unsure, contact ADEC.



Note the "upgraded" spill bucket behind the bent pipe in center of photo. While this technically meets the requirements for spill prevention, this set up is an operational hazard. The top of the bucket cap should be flush-mounted with island surface.

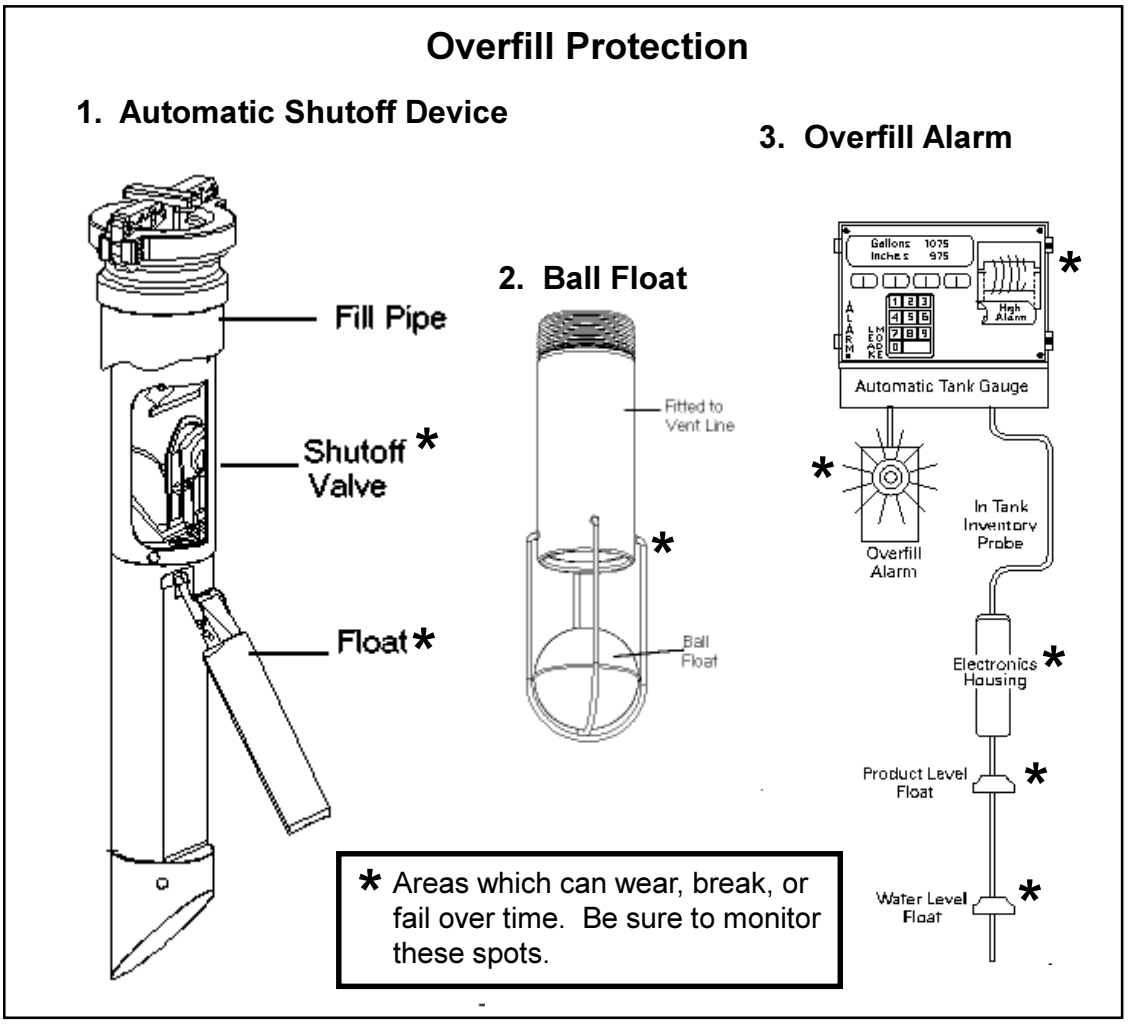
Also note the spill stain in center of island.

C. Overfill Protection - Three Choices

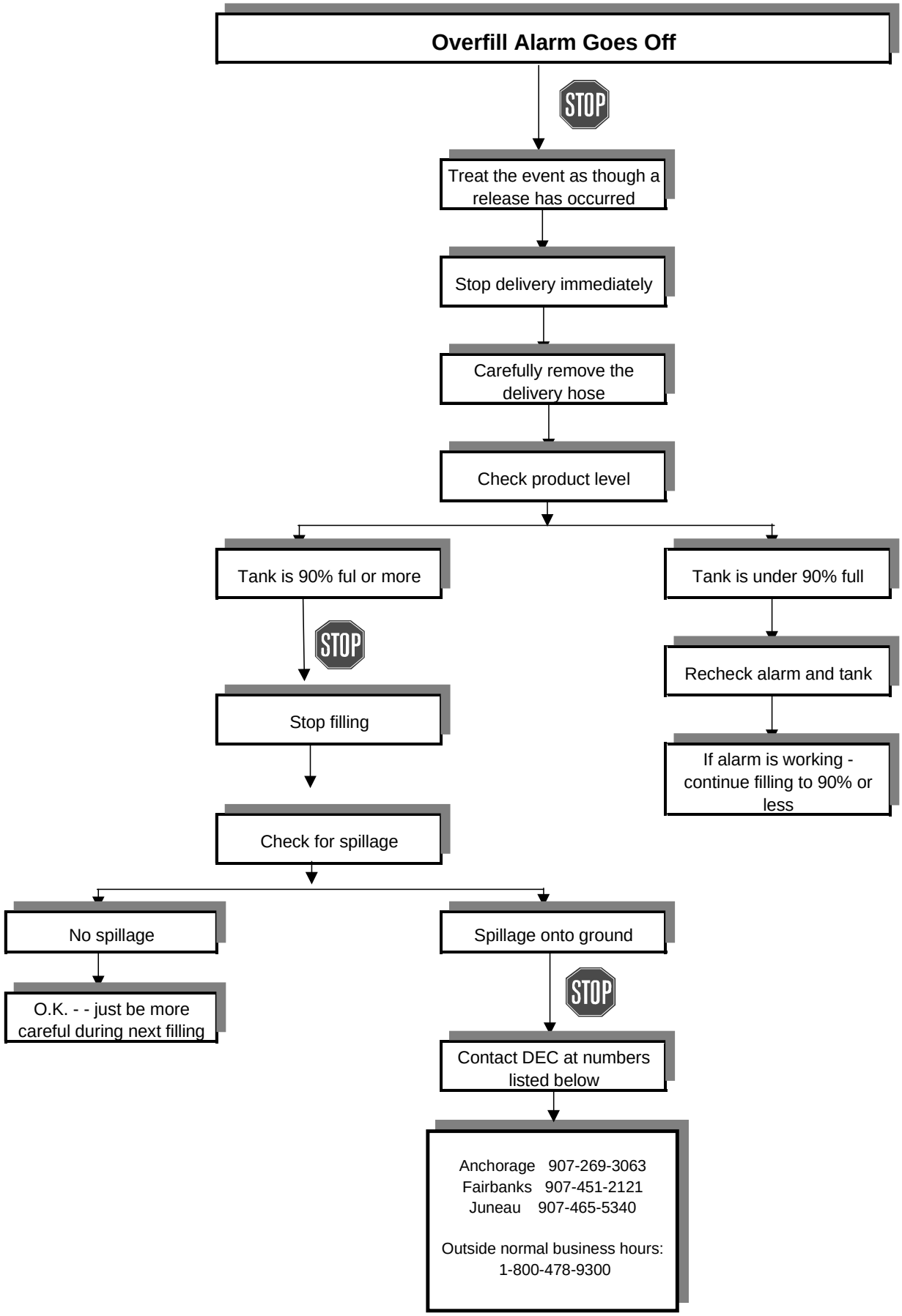
USTs must now have overfill protection when they are installed. The three types of overfill protection are:

- Automatic shutoff devices
- Overfill alarms
- Ball float valves

Overfills usually release much larger volumes than spills. When a tank is overfilled, large volumes can be released at the fill pipe and through loose fittings on the top of the tank or a loose vent pipe. The tightness of these fittings normally would not be a problem if the tank were not filled beyond it's capacity.



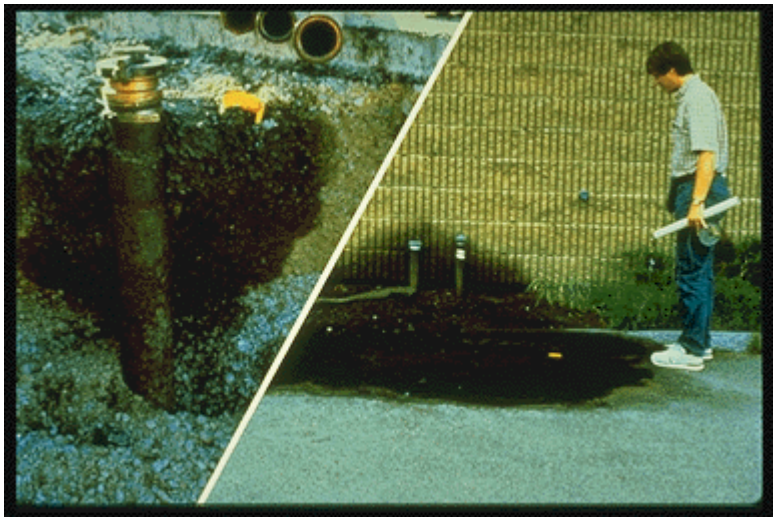
What To Do If Your Overfill Alarm Goes Off:



D. How Did I Do?

Yes	No	
☐	☐	Does my facility have proper spill/overfill protection?
☐	☐	Do I know what precautions to take before during and after fueling to prevent spills?

E. Spill/Overfill Problems/Questions



Repeated overfills add up. Check your spill buckets periodically and watch all deliveries to make sure you are not losing petroleum.

Chapter 6. Corrosion Protection

A. Overview

Corrosion protection for UST systems is important because unprotected steel USTs and piping can and do corrode. This may allow the release of product into the environment.

This section only applies if you have a steel tank, or steel pipe, or both. Please note that:

- Steel double-walled tanks need to meet corrosion protection.
- Double-walled piping with a non-metal outer wall and a metal inner wall does not need corrosion protection.

Tanks and pipes made of non-corrodible material, such as fiberglass, do not require corrosion protection.

B. Operation and Maintenance

State and Federal regulations outline what owners and operators must do to properly operate and maintain corrosion protection equipment. If you follow these requirements you can ensure a long life for your UST system.

National Perspective on Cathodic Protection

Many states are reporting that cathodic protection systems are not working at new installation and at recent tank upgrades. Tank owners who spent a considerable amount of money investing in rust-free steel tanks were surprised to learn that their systems were not only out of compliance but starting to rust. Routine testing of these systems can tell owners whether or not they are working.

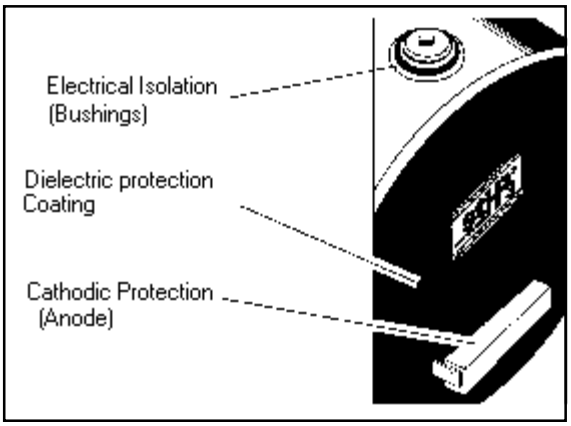
C. Cathodic Protection - What You Must Do

All owners and operators of steel UST systems with cathodic protection must regularly assure that their system is working. Use Table 6a (page 31) to make sure your cathodic protection system is operating correctly.

1. Sacrificial Anode

Sacrificial anodes can be attached to USTs for corrosion protection, but the tanks should also have a dielectric coating and electrical bushings.

Cathodic Protection

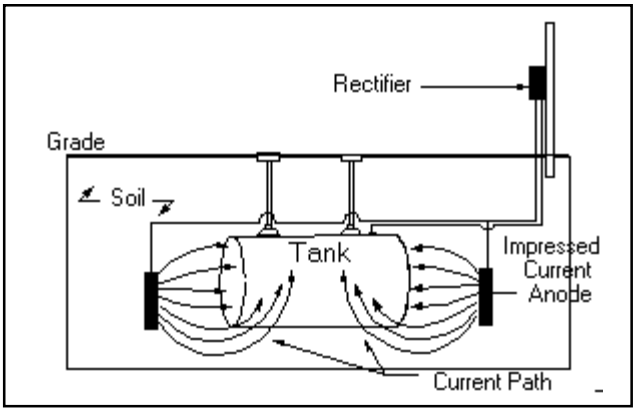


Three-component of galvanic cathodic protection. Tanks installed after 12/22/88 must have all three.

2. Impressed Current System

An impressed current system has a rectifier to convert alternating current to direct current. Impressed current systems need continuous inspection! See Table 6b (page 31) to do impressed current readings.

Impressed Current



Impressed current cathodic protection system

Table 6a - Operation of Cathodic Protection Systems

All corrosion protection systems must be operated and maintained continuously to provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.		
Y / N	Is your cathodic protection system in continous operation?	Notes:
All UST systems equipped with Cathodic protection systems must be inspected for proper operation by a certified cathodic protection tester in accordance with the following requirements		
Y / N	Was the cathodic protection on your tank and piping tested within 6 months of installation?	
Y / N	Do you test the anodes of your cathodic protection system every three years?	
Y / N	Was the person performing cathodic protection testing currently certified in Cathodic Protection Testing by the State of Alaska?	
The criteria that are used to determine that cathodic protection is adequate must be in accordance with National Association of Corrosion Engineers Standard RP-02-85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems".		
Y / N	Did your cathodic protection tester follow this procedure?	
Y / N	Do you save your cathodic protection testing records in a place that is easily accessible to an inspector?	
UST systems with impressed current cathodic protection systems must also be inspected every 60 days to ensure the equipment is running properly. This can be done by an owner or operator.		
Y / N	Do you track readings and record them in a log every 60 days? (See log on page 34)	

How to do Impressed Current Readings	
	Keep a log of readings (See the log on page 34).
	Know where your impressed current rectifier is located and what dial or instrument you should be reading.
	Place a reminder on your business calendar ever 60 days so you won't forget to take a reading.
	Take the reading and write it down in your log.
	Make sure you have a phone number of someone to contact if you think there is a problem or if you don't know if the number you recorded is acceptable.
	If you find a reading of zero, you probably do not have adequate corrosion protection. Contact the firm who installed the system and ask for help.

D. Internal Lining

A steel tank that has been upgraded with an internal liner generally have no routine operation and maintenance requirements for corrosion protection *so long as the tank also has a cathodic protection system installed.*

For a tank that only has an internal liner with no cathodic protection system (impressed or galvanic), the following O&M is required.

- ☐ Within 10 years, and every 5 years thereafter after the liner was installed, the liner must be internally inspected. This involves opening up the tank for a visual inspection by a training person.

- ☐ Date of first liner inspection is:
  Installation date + 10 years = _____ (fill in the date)

- ☐ Inspection must be done using a nationally recognized code of practice. And only persons with proper safety training should conduct inspection.

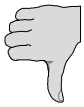
- ☐ The tank must be found to be structurally sound, with the lining still performing in accordance with the original design specifications.

An internal lining inspection involves sending a training professional into the tank to examine the integrity of the liner after years of service.

E. How Did I Do?

Yes	No	
☐	☐	Do all tanks an piping at my facility have the required corrosion protection?
☐	☐	Am I properly maintaining the cathodic protection?
☐	☐	Has the cathodic protection been tested according to standards and requirements?

F. Cathodic Protection Notes/Questions/Problems



What's wrong with this picture?

a) Putting a zinc anode in the ground and attaching it to a tank with a wire is not a cathodic protection upgrade.

b) If you add to or modify your cathodic protection system, it must be designed by a corrosion expert and installed by a licensed professional.

Alaska Department of Environmental Conservation

Cathodic Protection Monitoring Log

Facility Name	Facility ID	Location Address	Location City

Instructions: Use this form to keep track of your cathodic protection measurements for your Underground Storage Tank system. All steel tanks and piping with impressed current cathodic protection must be measured every 60 days to make sure there is enough current to prevent rusting.

Suggestions for taking and keeping good measurements:

1. Mark on your business calendar a reminder to take measurements every 60 days and choose an easy date to remember (like the first business day of every other month: 1/1/00, 3/1/00…).
2. Make sure you know where your voltage rectifier is located and which readings you need to log.
3. Fill out this log completely.
4. Know what to do if the readings look incorrect or if you are getting no readings.

Date (day/month/year)	Readings (Volts or Millivolts)	Name (Person doing readings)	Initials

Keep this log with your UST facility information. Save it if needed for an inspection.

Questions? Call 1-800-478-4974 or see our web page at *www.state.ak.us/dec/dspar/stp_home.htm*

Chapter 7. Recordkeeping and Compliance Checklist

A. What Records Must You Keep?

It is important to be organized and stay organized. Keep all of your UST records in one area so you can find them when you need them. Table 7a (page 36) lists all the recordkeeping requirements for USTs.

B. UST Record Keeping: The Basics

- Save all of your records. This includes receipts, warrantees, guarantees, pictures, videos, manuals or anything about your UST.
- Keep all test results, performance claims, inspections, corrosion tests, repair records, closures and assessment reports and proof of financial responsibility.
- Keep your records on site or at a place easy to access in case you have to provide information to an inspector.
- In general, you should keep all of your records for as long as the tank system is in place.
- **Attention new tank owners**: If you purchase an existing system or become a new operator, make sure you get copies of all existing records.

Good recordkeeping is an important part of maintaining your tank facility.

Table 7a - Recordkeeping Specific Requirements for Operation and Maintenance

ACTION		FORM NEEDED	SCHEDULE
Installation			
	BEFORE you install, repair or upgrade	**Intent to Install or Reconfigure**	15-60 days prior to starting work
	AFTER you install, repair or upgrade	**Registration/Repair/Upgrade/ Retrofit**	30 days after work is completed
Temporarily out of Service			
	When you take a UST temporarily out of service	**Taken Out of Service AND Empty Tank Affidavit**	When tank is emptied
Closure			
	Before you close (tank or piping)	**Closure Notice**	15-60 days prior to starting work
Change Ownership			
	Change of ownership of UST	**Change of Ownership**	Within 30 days of acquisition
Financial Responsibility			
	Proof of Financial Responsibility	**Certification of Financial Responsibility.**	By January 1 of each year or immediately after a release
Operations Inspection			
	Proof of Inspection	**Operations Inspection Report Form**	Every three years from date of first inspection

C. Where to Keep Records

A UST owner or operator must keep all required records at the UST site itself, or at a readily available alternative site, and must provide records for inspection upon request.

We suggest keeping all of your records in one central location, preferably in one filling cabinet so you can find them easily.

D. Compliance Checklist

Use this handy calendar to figure out what you need to do to keep up with the operational requirements for your UST system. ADEC suggests that once a year you print this page and post it near your business calendar, at your UST facility.

EVERY DAY – Do these things every day the UST is in service	
Action	**Description**
Inventory measurements*	Make sure you are take and log daily fuel level measurements (inventory control and SIR only)
Record deliveries*	Make sure you log the date and exact amount for each delivery
Checklist	❑ I am doing these actions every day the UST is in service (*Not required for emergency power generator USTs.)

Every MONTH - Make sure your tanks and pipe are safe						
Action	**Description**					
Complete inventory reconciliation*	Make sure you are reconciling your last 30 days worth of inventory readings. Make sure you see a "pass" or "fail" result.					
Release Detection Records*	Keep your last 12 months worth of release detection results.					
Checklist Check each month you complete release Detection (*Not required for emergency power generator USTs.)	❑ Jan 30 ____(yr)	❑ Feb 28 ____(yr)	❑ Mar 31 ____(yr)	❑ Apr 30 ____(yr)	❑ May 31 ____(yr)	❑ Jun 30 ____(yr)
	❑ Jul 31 ____(yr)	❑ Aug 31 ____(yr)	❑ Sep 30 ____(yr)	❑ Oct 31 ____(yr)	❑ Nov 30 ____(yr)	❑ Dec 31 ____(yr)

Every Other Month or Every 60 Days - Monitoring Rust (only for steel tanks and piping with impressed current cathodic protection (CP)			
Action	**Description**		
Take readings from voltage rectifier and log results	Rectifier shows the voltage readings of your CP system. It tells whether there is enough current to keep the system from rusting.		
Checklist Check each time you complete CP Reading	❑ Feb 28, ___ (yr)	❑ Apr 30, ___ (yr)	❑ Jun 30, ___ (yr)
	❑ Aug 31, ___ (yr)	❑ Oct 31, ___ (yr)	❑ Dec 31, ___ (yr)

EVERY YEAR -Your Annual Checklist				
Action	**Note**	**Suggested or required**	**Check if done**	**Date Done**
Submit annual registration fee	Except State and Federal Owners and Operators	No later than 12/31 of the year before due	❑	
Submit proof of financial responsibility			❑	
Perform calibration of automatic tank gauge (ATG)	Only for UST with ATG	Suggested each July or during third party inspection	❑	
Perform automatic line leak detector test	Only for UST with pressurized pipe		❑	
Test automatic line leak detector per manufacturer's specifications			❑	
Test overfill alarm	Usually found at ATG console		❑	
Periodic Walk Though	See your O&M Manual		❑	
Read this manual	Suggested reading	Save for slow months	❑	

EVERY 3 YEARS - Third Party Inspections		
Action	**Description**	**Due Date**
Operations Inspection	Hire a third party inspector to perform UST system check	April 30 to Aug 31 of the year inspection due. See current tag
Cathodic Protection (CP)Test	Certified CP tester checks corrosion reading on steel tank and pipe	Every three years from date of last test or during Operations Inspection
Checklist	❑ My next third party inspection is due _____ ❑ My next CP test id due _____ ❑ My operations tag expires _____	

E. How Did I Do?

Yes	No	
☐	☐	Do you know which records to keep?
☐	☐	Do you have copies of all records required?
☐	☐	Do you keep records at or near your facility?

F. Recordkeeping Notes/Questions/Problems

Generally, you should follow this rule of thumb for record keeping:

When in doubt, keep it!

Chapter 8: Additional O & M Suggestions

A. Not Necessarily the Law But a Good Idea

Do you and your staff have a maintenance program for the USTs at your facility? If so, Table 8a (below) has some suggestions to improve it. If not, then the table has some pointers for starting a maintenance program.

Use the checklist to see if you are doing routine maintenance on your UST system. If you answer yes to the first question, then proceed to the next. If you answer no, then read the recommendation and think about how you could improve your own maintenance plan.

B. Proper Maintenance Test (Table 8a)

Walk-through inspections of the UST system should be conducted twice a year - we suggest the fall and the spring. The purpose of these inspections is to identify any visual signs of potential leaks, and to take corrective measures. See Table 8b (page 42) and check the appropriate information for each item inspected. Make a note of any significant observations. Then contact a tank installer or inspector and have them correct or repair any problems.

Table 8a - Proper Maintenance Checklist

Answer Yes or No to the following:	
Training	**Have all staff been trained to operate facility equipment?** **Y / N** *If you answered No:* Make sure all equipment manuals are readily available. Contact ADEC for ideas on training options.
Manuals	**Can you locate equipment manuals if you need them?** **Y / N** *If you answered No:* Make a special space, file, or box which contains all of your manuals. If you cannot find a manual, contact manufacturers, and get a new one.
Leaks	**Do you and your staff know what to do if you overfill alarm goes off or if you** **Y / N** **have questionable release detection tests?** *If you answered No:* See Chapters 3 & 4
Help	**Do you know who to call for help or questions?** **Y / N** *If you answered No:* See Chapter 10

Table 8b - Periodic Walk Through Inspection

We suggest you do these inspections at least twice a year - in addition to other activities listed in the Operation Checklist:

Check each item below & make repairs/changes as necessary:

(make copies of this inspection checklist for each inspection you perform)

Equipment	What to look for	Inspection Date	All O/K?
Dispenser Hoses/ Nozzles	Inspect all product dispenser hoses and nozzles for loose fittings, deterioration, obvious signs of leakage, and proper functioning.		**Y / N**
	If you answered No, then: Replace bad parts or call installer/ inspector for assistance.		
Dispenser Sumps	Open each dispenser and inspect all visible dispenser lines, fittings and couplings, and inspect the sump beneath the dipenser for any signs of leakage.		**Y / N**
	If you answered No, then: Tighten loose parts or call installer/inspector for help.		
Sump Monitor	Inspect and test sump monitor to make sure it is working.		**Y / N**
	If you answered No, then: Call manufacturer or read manual, or call installer/inspector about repairs.		
Piping Sumps	Inspect the piping sumps located on the top of each UST for liquid.		**Y / N**
	If you answered No, then: If liquid is present, determine if it is water only (i.e. rainwater) or if it contains product. If water is present and no product is present, pump the water out and place in a designated container. If product is present in sumps, conduct the following activities: ❒ Notify the Facility Manager immediately. ❒ Pump out the product and place in a designated container. ❒ Evaluate source & take corrective action.		
Fill Pipes	Inspect all tank fill pipes and other access points to make sure that the covers and caps are tightly sealed.		**Y / N**
	If you answered No, then: Secure caps and covers. Call installer or inspector if problem persists.		
Spill Supplies	Inventory and inspect the emergency spill response supplies. Inspect supplies for deterioration and improper functioning.		**Y / N**
	If you answered No, then: If the supplies are low, or in poor condition, restock or repair.		
Overfill Alarm	Test alarm in accordance with manufacturer's specifications. Audible alarm should sound.		**Y / N**
	If you answered No, then: Consult manual or contact manufacturer.		

C. How Did I Do?

Yes	No	
☐	☐	Did you find something during the walk through that required fixing or replacing?
☐	☐	Were you able to crorrect the problem?
☐	☐	Did you know who to call for help?

D. Notes/Questions/Problems

Chapter 9. Third Party Inspections

Starting in June 2000, all active, regulated UST systems must now be inspected by a certified Operations Inspector every three years. Owners and Operators hire a third party inspector to examine, test and verify a UST has all the functioning equipment necessary to be in compliance with all State regulatory requirements.

A. Some Facts:

- Existing tanks and piping must be inspected between 2000 and 2002.
- ADEC assigns tank inspection due date.
- For the Year inspection is due, owners and operators have 120 days (April 30 to August 31) to complete the inspection.
- Tanks and piping must be inspected every three years thereafter.
- An Inspector must fill out an inspection report form that you must sign.
- If a problem is discovered during inspection, it can be corrected during the inspection and you will not be penalized.
- UST systems that fail inspection cannot get a tag and cannot receive fuel.
- You do not need to get a UST inspected if it will be permanently closed by the inspection date.
- Tanks temporarily out of service must be inspected too.

B. Different Types of Tags

All tanks must have a visible inspection tag in order to receive fuel. The different types of tags are as follows:

- **Starter Tag:** Issued by ADEC for all active tanks. This tag is good until first inspection is complete.
- **Permanent Tag**: Issued by ADEC after approval of the Inspection report. This tag is good until the next inspection in three years.

Make sure your tag is placed in a location where your fuel distributor can see it prior to delivery! Remember: No tag - No fuel!


Alaska Department of Environmental Conservation

Operations Inspection Starter Tag

STORAGE TANK PROGRAM

Underground Storage Tank Owner or Operator

«Name»

SAMPLE

is approved to receive petroleum under 18 AAC 78.015 (a)(3) for:

Facility Name	Facility ID #	Street Address	City:
«LocName»	«FacilityID»	«LocStr»	«tlkpZIP_1_City»
ADEC Tank #:	**Owner Tank #:**	**Product Stored:**	**Capacity:**
«TankID»	«AltTankID»	«SubstanceDesc»	«TankCapacity»

This Tag is for Tank # «TankID» only
Expires «Inspection_Due_Date»

James F. Hayden 8/27/99
Program Manager

No person may tamper with or disregard this tag and no person may remove this tag until it expires and is replaced. 18 AAC 78.015 (a)(5).

This is an example of a Starter Tank Tag.

C. Finding an Inspector

ADEC certifies UST Operations Inspectors. To get a list of inpsectors contact ADEC at 800-478-4974 or go to our web page at:
http://www.state.ak.us/dec/dpsar/inspector.htm

D. What Can I Do to Prepare For an Inspection?

- ☐ Read this manual and fill out the checklists.
- ☐ Review your equipment manuals and booklets.
- ☐ Have all of your records and receipts ready for the Inspector to review.
- ☐ Contact ADEC if you have any questions.

First Inspection

Your first inspection may be the most difficult, especially if you are unsure of your equipment or have never been inspected. Be prepared!

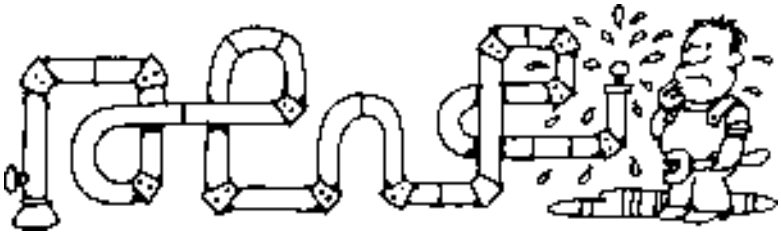
E. How Did I Do?

Yes	No	
☐	☐	Do I understand what an Inspector is looking for?
☐	☐	Am I prepared for an inspection?
☐	☐	Do I know what to do if a problem is discovered?
☐	☐	Do I know where to where to place my inspection tag?

F. Inspection Notes/Questions/Problems

If a Problem is Identified During an Inspection. . .

An inspector should be able to correct most problems found during an inspection. But ADEC suggests getting a few bids before deciding on a contractor for the repair work.



Case Study

In Alaska in 1999, 700 people were evacuated from a large office building because diesel had spilled from a UST during delivery. The fuel ran into the basement and the fumes got into the building's air intake system. An investigation revealed that the system's two overfill devices failed, plus the piping and sump were installed incorrectly. While no fuel entered the environment (soil and water), over 150 gallons was spilled into the basement. Proper maintenance and regular inspections would have discovered, and possibly prevented, this spill from occurring.

Chapter 10. Resources and References

A. Contact Information

1. ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

a. For Technical Information, State Regulations and Requirements, Certified Worker/Inpsector Information, and General Program Information:

Alaska Department of Environmental Conservation
Storage Tank Program
410 Willoughby Avenue
Juneau, AK 99801
907-465-5200 (phone)
907-465-5218 (fax)
website@*envircon.state.ak.us* (e-mail)
www.state.ak.us/dec/dspar/stp_home.htm (internet)

b. For Leaking UST Cleanup Assistance:

Anchorage	907-269-7500
Fairbanks	907-451-2100
Juneau	907-465-5200
Soldotna	907-262-5210

Outside normal business hours: 1-800-478-9300

c. For Copies of Forms and to Submit Forms:

ADEC Storage Tank Program
555 Cordova Street
Anchorage AK 99501
FX 907-269-7507

2. U.S. ENVIRONMENTAL PROTECTION AGENCY

For information on the Federal UST program:

EPA Alaska Operations Office
Federal Building, Room 537
222 W. 7th Ave, #19
Anchorage, AK 99513-7588
Phone: 907-271-3541
FAX: 907-271-3424

B. Recommended Reading

1. PUBLICATIONS FROM THE ENVIRONMENTAL PROTECTION AGENCY

The following publications are free and available from the US Environmental Protection Agency (EPA). You can request these documents a number of ways:

- Phone: Call 1-800-424-9346
- Fax-on-Demand: Dial 202-651-2098 on your fax to access the EPA fax-on-demand service to receive via fax over 220 UST documents.
- Internet: *http://www.epa.gov/swerust1/pubs/index.htm*

a. RELEASE DETECTION

Doing Inventory Control Right for Underground Storage Tanks

(EPA 510-B-93-004). November 1993. This 17-page booklet describes inventory control methods that can be used to help owners and operators of underground storage tank (UST) systems meet federal regulatory leak detection requirements. The booklet provides a step-by-step process for inventory control that is clear and easy to follow.

Getting The Most Out Of Your Automatic Tank Gauging System
(EPA-510-F-98-011) March 1998. Tri-fold leaflet provides UST owners and operators with a basic checklist they can use to make sure their automatic tank gauging systems work effectively. As a compliance assistance tool, the leaflet focuses on what actions the UST owner and operator must take to comply with leak detection requirements and prevent significant cleanup problems.

Introduction to Statistical Inventory Reconciliation: For Underground Storage Tanks *(EPA 510-B-95-009). September 1995.* This 12-page booklet provides basic information on this leak detection method.

Leak Detection Fact Sheet #1
(EPA-510-F-98-012). March 1998. This two-page fact sheet identifies which UST systems installed before December 22, 1998 need to have monthly monitoring leak detection by December 23, 1998.

List of Leak Detection Evaluations for UST Systems - 6th Edition,
August 23, 1999

Manual Tank Gauging for Small Underground Storage Tanks.
(EPA 510-B-93-005). November 1993. This 12-page booklet explains the Federal and state laws require that underground storage tanks (USTs) to be equipped with leak detection systems. Although much attention has been focused on large USTs, it is important that leaks from smaller tanks (generally less than 2,000 gallons of capacity) also have leak detection systems. This booklet provides simple, easy to follow, step-by-step directions for the correct way to conduct manual tank gauging for these smaller tanks.

Straight Talk On Tanks: Leak Detection Methods for Petroleum Underground Storage Tanks and Piping *(EPA 510-B-97-007). September 1997.* This 28-page booklet, which has been newly updated, provides easy-to-understand descriptions of several leak detection methods for tanks and piping, as well as explanations of the regulatory requirements for leak detection. Leak detection methods include: secondary containment with interstitial monitoring, automatic tank gauging, vapor monitoring, groundwater monitoring, statistical inventory control, tank tightness testing with inventory control, and manual tank gauging.

b. OTHER DOCUMENTS

Catalog of EPA Materials on Underground Storage Tanks *(EPA-510-B-98-001) March 1998.* The Catalog provides an annotated list of UST materials and includes ordering information. Many of the informational leaflets, booklets, videos, and software items listed are designed to provide UST owners and operators with information to help them comply with the federal UST requirements.

Ordering Information on Underground Storage Tanks. *(EPA 510-F-98-016) August 1998.* This 4-fold leaflet describes free UST informational leaflets and booklets, as well as several videos available for a fee. *NOTE: these files print on LEGAL size paper (8.5" x 14").*

List of Integrity Assessment Evaluations for Underground Storage Tanks- Third Edition January 22, 1999. This 8-page EPA Memorandum (dated February 9, 1999) provides a list of integrity assessment procedures that have been successfully evaluated and certified by a qualified independent third party to meet specified performance criteria.

EPA Publications About UST Requirements
This list, updated for 1999, is also known as “PUBLIST.99”. This two-page flyer lists publications and videos available through the National Service Center for Environmental Publications (NSCEP) at *http://www.epa.gov/ncepihom/>.*

Musts for USTs: A Summary of the Federal Regulations for Underground Storage Tank Systems *(EPA 510-K-95-002).* This 40-page booklet summarizes Federal UST requirements for installation, release detection, spill, overfill, and corrosion protection, corrective action, closure, reporting and recordkeeping.

Survey of Flexible Piping Systems *March 1997.* This survey, conducted by ICF, includes information on which companies are making various types of flexible pipe, the number of installers, piping construction, compatibility, materials warranty, and the status of various system in meeting national codes and

standards.

Underground Storage Tanks: Requirements and Options
(EPA 510-F-97-005). June 1997. A leaflet directed to nonmarketers of petroleum that provides you with a quick overview of your responsibilities and choices for complying with Federal UST regulations. The leaflet also provides a selected list of relevant publications and other sources of information about USTs.

2. ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

(these documents are also available on the Storage Tank Home Page at *http://www.state.ak.us/dec/dspar/stp_home.htm*)

- **ALASKA TANK NEWS (quarterly newsletter)**
- **UNDERGROUND STORAGE TANK REGULATIONS AND STATUTES.**

- **UST PROCEDURES MANUAL**

C. Internet Resources

(Links to external servers do not imply any official ADEC endorsement of the opinions or ideas expressed therein, or guarantee the validity of the information provided.)

Government Links

- US EPA Office of Underground Storage Tanks: *www.epa.gov/OUST*
- AK Department of Environmental Conservation, Storage Tank Program: *www.state.ak.us/dec/dspar/stp_home.htm*

Association Links

- American Petroleum Institute (API): *www.api.org/*
- American Society of Testing and Materials (ASTM): *www.astm.org/index.html*
- Association of State and Territorial Solid Waste Management Officials (ASTSWMO -Tanks Subcommittee): *www.astswmo.org/tanks.htm*
- International Fire Code Institute(IFCI): www.ifci.org
- Assessment Systems Inc (ASI). *www.asisvcs.com/*
- New England Interstate Water Pollution Control Commission (NEIWPC): *www.neiwpcc.org/educate.html#links*
- National Association of Corrosion Engineers (NACE): *www.nace.org/*
- National Fire Protection Association (NFPA): *www.nfpa.org*
- Petroleum Equipment Institute (PEI): *www.peinet.org/*
- Steel Tank Institute (STI): *www.steeltank.com/*
- Underwriter's Laboratory (UL): *www.ul.com*

Miscellaneous Tank Links

- Global Network of Environment & Technology Tanks: Page (GNE&T): *www.gnet.org/filecomponent/4446.html*
- The National Association of Convenience Stores (NACS): *:www.cstorecentral.com/public/nacs/05.htm*
- Petroleum Marketers Association of America (PMAA): *www.pmaa.org:*
- Petroleum and Petrochemical Industries Resource: *www.petrochem.net*
- Petroleum News Alaska : *www.petroleumnewsalaska.com/*

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Copies of Forms and Checklists

This section contains copies of forms and checklists which you may want to copy and reuse several times. Please make as many copies as needed.

TABLE 2b - Proper Operation Checklist

All of the following must be checked (as applicable):

When	Done?	What Activity or Task
Every Day		Complete release detection measurements for active tanks and piping (electronically or manually)
Every Month		Complete inventory reconciliaton for release detection
Every Two Months		Perform cathodic protection monitoring and log results (impressed current only)
Two times/year		Walk-through inspection (See Table 2d)
Every Year		Submit registration fees by December 31 for the upcoming year (except State and Federal Government)
		Submit financial responsibility by December 31 for the upcoming year (except State and Federal Govt)
		Perform calibration of automatic tank gauge per manufacturer's specifications.
		Perform automatic line tightness test (pressurized line only)
		Test automatic line leak detectors per manufacturer's specifications
		Read this manual Test overfill equipment (especially alarms)
Once every 3 years		Hire person to perform operation inspections and submit report to ADEC
		Post latest inspection tag, decal, or notice
		Do cathodic protection testing (part of third party inspection)
Once every 5 years		Hire person to do tank tightness testing (only if you use inventory control or manual tank gauging)
Continuously		Keep spill bucket clean

TABLE 2c - Proper Maintenance Checklist

Answer Yes or No to the following:

Training	**Have all staff been trained to operate facility equipment?** **Y / N** *If you answered No:* Make sure all equipment manuals are readily available. Contact ADEC for ideas on training options.
Manuals	**Can you locate equipment manuals if you need them?** **Y / N** *If you answered No:* Make a special space, file, or box which contains all of your manuals. If you cannot find a manual, contact manufacturers, and get a new one.
Leaks	**Do you and your staff know what to do if you overfill alarm goes off or if you have questionable release detection tests?** **Y / N** *If you answered No:* See Chapters 3 & 4
Help	**Do you know who to call for help or questions?** **Y / N** *If you answered No:* See Chapter 10

TABLE 2d - Periodic Walk Through Inspection

We suggest you do these inspections at least twice a year - in addition to other activities listed in the Operation Checklist:

Check each item below & make repairs/changes as necessary:

(make copies of this inspection checklist for each inspection you perform)

Equipment	What to look for	Inspection Date	All O/K?
Dispenser Hoses/ Nozzles	Inspect all product dispenser hoses and nozzles for loose fittings, deterioration, obvious signs of leakage, and proper functioning.		**Y / N**
	If you answered No, then: Replace bad parts or call installer/ inspector for assistance.		
Dispenser Sumps	Open each dispenser and inspect all visible dispenser lines, fittings and couplings, and inspect the sump beneath the dipenser for any signs of leakage.		**Y / N**
	If you answered No, then: Tighten loose parts or call installer/inspector for help.		
Sump Monitor	Inspect and test sump monitor to make sure it is working.		**Y / N**
	If you answered No, then: Call manufacturer or read manual, or call installer/inspector about repairs.		
Piping Sumps	Inspect the piping sumps located on the top of each UST for liquid.		**Y / N**
	If you answered No, then: If liquid is present, determine if it is water only (i.e. rainwater) or if it contains product. If water is present and no product is present, pump the water out and place in a designated container. If product is present in sumps, conduct the following activities: ❒ Notify the Facility Manager immediately. ❒ Pump out the product and place in a designated container. ❒ Evaluate source & take corrective action.		
Fill Pipes	Inspect all tank fill pipes and other access points to make sure that the covers and caps are tightly sealed.		**Y / N**
	If you answered No, then: Secure caps and covers. Call installer or inspector if problem persists.		
Spill Supplies	Inventory and inspect the emergency spill response supplies. Inspect supplies for deterioration and improper functioning.		**Y / N**
	If you answered No, then: If the supplies are low, or in poor condition, restock or repair.		
Overfill Alarm	Test alarm in accordance with manufacturer's specifications. Audible alarm should sound.		**Y / N**
	If you answered No, then: Consult manual or contact manufacturer.		

TABLE 3a - Release Detection Methods for Most Tanks

(Answer each question that applies with a Yes or No)

1. Interstital Monitoring/Double Walled Tanks

Interstitial monitoring is a method of release detection used for double walled tanks.		NOTES:
Y / N	**Do you check your interstitial space every 30 days?** Unless you are checking or testing the interstitial space every 30 days, simply having a double walled tank or piping is not enough.	
Y / N	**Do you keep a log book of the interstitial space readings? Do you know where it is?** If you are manually checking the interstitial space, you must keep a log of the test results.	
Y / N	**Do you save your print-outs each month?** If you have an electronic sensor between the inner and outer tank walls, you need to make sure you keep a printed readout of each test.	
Y / N	**Do you test your probes according to the manufacturer's specifications?** Sensor probes do fail periodically. Be sure your sensor is tested per manufacturer's specifications.	

2. Automatic Tank Gauging (ATG) Systems

This method uses authomated processes to monitor product level & inventory control.		NOTES:
Y / N	**Does your ATG test for leaks every 30 days? Do you save your ATG printouts?** Unless you are keeping records of actual release detection results every 30 days, you are not doing leak detection right. You are in effect not doing release detection at all. Save ATG printouts for the past 12 months.	
Y / N	**Is your ATG approved by a third party vendor?** Your ATG must be tested and approved by a third party who can verify the performance of the device. Often the approval is in the last chapter of your ATG Manual. If you can't find it, have the manufacturer provide you with the third party approval. The best place to confirm the approval of the equipment is the National Leak Detection Workgroup Evaluations. If you can't find it, have the manufacturer provide you with the third party approval. Keep a copy in your files.	
Y / N	**Have you talked to your ATG vendor in the last few years and are you sure they are still available for service?** If you have an automatic tank gauge system installed in the late 1980's or early 1990's, you may find that some of the manufacturers may not be in business any more.	
Y / N	**Is your ATG still servicable?** If you cannot service your ATG because the manufacturer is no longer in business, you cannot use that particular ATG. You must install a new one.	
Y / N	**Is your ATG system working properly?** Automatic tank gauges can give a tank owner a false sense of security. Owners assume that the sytem will work forever. Most ATGs have a "test" or "self-diagnosis mode". Read your manual, run the test, and see if your ATG is working properly. A good practice is to manually stick the tanks periodically to verify ATG readings.	
Y / N	**Have you read through your ATG manual in the last year?** If you have never read your ATG manual, you stand a good chance of doing release detection wrong.	

Continued on next page)

TABLE 3a - Release Detection Methods for Most Tanks (continued)

3. Statistical Inventory Reconciliation (SIR)

In this method of release detection, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data.		NOTES:
Y / N	**Is the SIR Method you use approved by a third party?** The company that performs your SIR assessment must be approved by a third party. (Ask the vendor about their National Leak Detection Workgroup Evaluations). Have the company prove to you that they are approved.	
Y / N	**Has you SIR vendor assured you in writing that their method can be used for piping?** If you do SIR for piping as well as tanks, the method you use must be approved for piping. Not all SIR vendors are approved for piping.	
Y / N	**If you have manifold tanks, is your SIR vendor approved to assess manifolded tanks?** Not all vendors are. If not, select another vendor or use another type of release detection.	
Y / N	**If you receive an "inconclusive" result, have you worked with the SIR vendor to correct the problem?** If you receive two "inconclusive" results in a row, you must notify ADEC of a suspected release.	

Y / N	**IMPORTANT: If you receive a "failed" result, have you notified ADEC of a suspected release?** You must do this.	

TABLE 3b - Special Tanks

Section 1 - Inventory Control and Tank Tightness Testing

(Answer each question that applies with a Yes or No)

Y / N	Do you take inventory measurements and enter the numbers into a log each day the tank is in use?	NOTES:
Y / N	Do you use a State or Federal Inventory Reconciliation form? (Note: An inventory Control Form is available at the end of Chapter 3)	
Y / N	Do you reconcile your records each 30 days?	
Y / N	Do you conduct a tank tightness test every five years after the date of upgrade or installation?	
Y / N	Do you keep records of inventory control and tank tighness test results in case an inspector asks for them?	
Y / N	Do you analyse inventory control sheets each month to determine whether or not your tanks are leaking?	
Y / N	Do you test for water once a month with water indicator paste, and list results on the reconcilliation sheet?	
Y / N	Can your stick measure to 1/8"?	
Y / N	Do you have an accurate tank chart?	

Section 2 - Manual Tank Gauging (MTG)

Y / N	Do you take inventory measurements weekly and enter the numbers in a log book?	NOTES:
Y / N	Do you use a State or Federal Manual Tank Gauging form? (Note: A Manual Tank Gauging Form is available at the end of Chapter 3)	
Y / N	Do you reconcile your records each 30 days?	
Y / N	Do you conduct a tank tightness test every five years after the date of upgrade or installation (only for tanks between 1,001 and 2,000 gallons)?	
Y / N	Do you keep records for your manual tank gauging and tank tightness test results in case an inspector asks for them?	
Y / N	Do you analyse your manual tank gauging sheets each month to determine whether or not your tanks are leaking?	

Table 3c - Pressurized Piping

Section A

If You Have:	☑	Make Sure You:
Automatic Shut-Off Device (Mechanical or electronic device that shuts off fuel if a drop in pressure is detected)		Annually test your device and confirm it is operational.
		Have the unit serviced (suggest annually)
Automatic Flow Restrictor (Mechanical or electronic device that slows down fuel if a drop in pressure is detected)		Annually test your device and confirm it is operational
		Have the unit serviced (preferably annually)
Continuous High Level Alarm (Loud alarm sounds if pressure drops)		Annually test your alarm
		Do not ignore alarm if it goes off
		Do not disconnect the alarm

Section B

If you do this:	☑	Make Sure You:
Annual Line Tighness Test		Hire a currently certified UST tank tightness tester and do line tightness test
		Keep records of results
Interstitial Monitoring (double wall)		See requirements under tanks above in Table 3a, Section 1
Statistical Inventory Reconciliation		See requirements under tanks above in Table 3a, Section 3

Table 3d - Suction Piping

No release detection required if:	Y / N	Piping slopes back to tank
	Y / N	Piping has only one check valve that is located beneath the pump at the dispenser

If you cannot answer yes to both boxes above, then these are your options:

Choose one of the release detection methods:	☑	Make Sure You:
Line Tightness Testing (every 3 years)		Hire a currently certified UST tank tighness tester and do line tighness testing
		Keep a record of the results
Interstitial Monitoring (double wall)		See requirements under tanks in Table 3a, Section 1
Statistical Inventory Reconciliation		See Requirements in Table 3a, Section 3

Emergency Contact Information

Emergency Contact

Name: _____ **Title:** _____

Company: _____

Phone #: _____ **Emergency #:** _____

Cell phone#: _____ **Fax #:** _____

What to do before, during and after fuel delivery:

☑	**Do all of the following:**
BEFORE	
	Order only the quantity of fuel that will fit in the tank. (Tank should only be 90% full). Example: 10,000 gallon tank minus 2000 gallons already in tank minus 1000 gallons ullage equals 7000 gallon delivery.
	Pre-arrange fuel deliveries so staff is present.
	Keep all fill ports locked.
	Verify that flow restrictor/high level alarm, automatic shutoff, or other overfill prevention device is functional.
	Create a label to tell the delibery person what type of overfill device is present and explain what to do if it activates.
	Make sure the high-level alarm is located where the delivery person can see or hear it.
	Verify spill containment bucket is functional and clean. Remove water, close shutoff valve and check for adequate capacity.
	Ensure that No Smoking signs are properly posted.
	Have oil spill sorbent pads available at the time of fuel deliveries.
	Where possible, request metered fuel drops.
	Ensure that containment sump is clean and dry prior to delivery.
	Keep fill ports locked until driver requests access.
	Have a tank capacity chart available for the delivery person.
DURING	
	The driver should make all hook-ups. The driver and facility personnel assigned to observe should stand by during the entire product delivery and be prepared to stop flow from the truck should any unusual conditions, leaks or spills be observed.
	Provide adequate lighting and safety barriers around the fueling zone.
	In the event of any spills or leaks, the driver will be responsible for stopping flow from the truck and the observer will notify the facility managers.
AFTER	
	Verify fuel drops using either manual methods (i.e., stick with water paste) or in-tank gauging before and after delivery.
	Following completion of the delivery,the driver is to be responsible for disconnecting all hook-ups.
	After fuel delivery, make sure fill ports are properly padlocked.
	Ensure sump is free of product.

Alaska Department of Environmental Conservation

STORAGE TANK PROGRAM

Cathodic Protection Monitoring Log

Facility Name	Facility ID	Location Address	Location City

Instructions: Use this form to keep track of your cathodic protection measurements for your Underground Storage Tank system. All steel tanks and piping with impressed current cathodic protection must be measured every 60 days to make sure there is enough current to prevent rusting.

Suggestions for taking and keeping good measurements:

1. Mark on your business calendar a reminder to take measurements every 60 days and choose an easy date to remember (like the first business day of every other month: 1/1/00, 3/1/00…).
2. Make sure you know where your voltage rectifier is located and which readings you need to log.
3. Fill out this log completely.
4. Know what to do if the readings look incorrect or if you are getting no readings.

Date (day/month/year)	Readings (Volts or Millivolts)	Name (Person doing readings)	Initials

Keep this log with your UST facility information. Save it if needed for an inspection.

Questions? Call 1-800-478-4974 or see our web page at *www.state.ak.us/dec/dspar/stp_home.htm*