TankIQ

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Training Guide
For Class A and B UST Operators

October 2015
Rev 1

Petroleum and Chemical Bulk Storage Programs
Bureau of Technical Support
Division of Environmental Remediation

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Note to Readers of This Guidance

This Guide contains information to assist individuals who desire to become authorized Class A and/or Class B Operators at petroleum or chemical bulk storage facilities in New York State (NYS) to prepare for the NYS Department of Environmental Conservation's (DEC) Class A and/or B Operator exam. This Guide was prepared to assist owners and operators of Petroleum Bulk Storage (PBS) and Chemical Bulk Storage (CBS) facilities that are simultaneously subject to New York State [6 NYCRR Part 613 and/or 6 NYCRR 596-599] and to federal [40 CFR Part 280] regulatory requirements. This guidance does not address requirements for aboveground storage tanks and is not intended to address every tank system scenario encountered at a facility. This document should not be relied upon or cited as a DEC Program Policy.

Adherence to this guidance does not relieve any PBS or CBS facility owner or operator from:

a) complying with requirements or provisions imposed by any applicable federal, state or local statutes or regulations that may be determined to be more stringent;

b) obtaining any and all registrations/licenses/permits required by federal, state or local statute or regulation;

c) complying with an existing order, agreement, stipulation or permit.

No provisions of this guidance should be construed to alter the requirements of the NYS Navigation Law, Environmental Conservation Law, or any regulation promulgated pursuant thereto. It is the responsibility of the tank system owner and operator to ensure that the facility is in compliance with all applicable (i.e., local, state and federal) regulatory requirements. Similarly, inspectors and auditors are responsible for being aware of any changes to statutory or regulatory requirements that affect compliance evaluation determinations.

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Acronyms

Acronym	Term
AC	Alternating Current
ALLD	Automatic Line Leak Detector
AST	Aboveground Storage Tank
ATG	Automatic Tank Gauge
CBS	Chemical Bulk Storage (see 6 NYCRR 596-599)
DC	Direct Current
ELLD	Electronic Line Leak Detector
EPA	Environmental Protection Agency (United States)
FRP	Fiberglass Reinforced Plastic
MLLD	Mechanical Line Leak Detector
NFPA	National Fire Protection Association
NWGLDE	National Work Group on Leak Detection Evaluations
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
DEC	New York State Department of Environmental Conservation
PBS	Petroleum Bulk Storage (see 6 NYCRR 613)
SIR	Statistical Inventory Reconciliation
STP	Submersible Turbine Pump
UDC	Under-Dispenser Containment
UL	Underwriters Laboratories
ULC	Underwriters Laboratories of Canada
US	United States
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank

Glossary

Note: Definitions for CBS facilities and tank systems may differ. Refer to 6 NYCRR Part 596.1(c).

Term	Definition
Automatic tank gauge (ATG)	Probe inside a tank that measures product and water level and can conduct in-tank testing. An ATG is usually part of an electronic monitoring system.
Category 1 Tank System	Any tank system whose tank was installed before December 27, 1986. (PBS only)
Category 2 Tank System	Any tank system whose tank was installed from December 27, 1986 through October 11, 2015. (PBS only)
Category 3 Tank System	Any tank system whose tank was installed after October 11, 2015. (PBS only)
Cathodic protection	Prevention of electrolytic corrosion of a metallic structure (tank or piping) by causing it to act as the cathode rather than as the anode of an electrochemical cell.
Class A Operator	The individual who has primary responsibility to operate and maintain the UST system(s) at a facility in accordance with applicable requirements of the PBS and/or CBS regulations. The Class A Operator typically manages resources and personnel to achieve and maintain compliance with the requirements of those regulations.
Class B Operator	The individual who has day-to-day responsibility for implementing applicable requirements of the PBS and/or CBS regulations. The Class B Operator typically implements field aspects of operation, maintenance, and associated recordkeeping for the UST system.
Class A/B Operator	An individual who has both A and B Operator responsibilities
Class C Operator	The individual who has primary responsibility for initially addressing emergencies presented by a spill or release from a UST system. A PBS Class C Operator typically controls or monitors the dispensing or sale of petroleum.

Term	Definition
Design capacity	The amount of petroleum or hazardous substance that a tank is designed to hold. If a certain portion of a tank is unable to store petroleum because of its integral design (for example, electrical equipment or other interior components take up space), the design capacity of the tank is thereby reduced. Actions taken to physically alter the design capacity of a tank (such as drilling a hole in the side of the tank so that it cannot hold petroleum above that point) will not change the design capacity of the tank.
Facility	See Section 4.2 (PBS) and 6 NYCRR 596.1(c).
Facility owner	Any person who has legal or equitable title to the real property of a facility.
Interstitial space	The space between the primary and secondary walls of a tank or pipe.
Leak, spill, or spillage	Any escape of petroleum from the ordinary container employed in the normal course of storage, transfer, processing, or use. Any escape of petroleum that enters containment (for example, a catch basin) is a spill. (For CBS, see Section 19.5)
Operator	Any person who leases, operates, controls, or supervises a facility.
Petroleum	Petroleum means: • crude oil and any fraction thereof; • synthetic forms of lubricating oils, dielectric oils, insulating oils, hydraulic oils, and cutting oils; • any complex blend of hydrocarbons that is not derived from crude oil; or • any petroleum mixture as defined in Part 613 section 1.3(at). Petroleum does not include: • any hazardous substance covered under CBS regulations, except certain blends (see Part 613 section 1.3(at)(2)); • animal or vegetable oils; or • substances that are gases at standard temperature and pressure.
Red tag	Tag attached to a tank as notification that product deliveries to the tank are prohibited by order of DEC

Term	Definition
Tank	The portion of a tank system that contains the majority of the petroleum or hazardous substance in the tank system. Each section of a compartmented tank will be treated as an individual tank.
Tank system	A stationary device designed to store petroleum that is constructed of non-earthen materials that provide structural support. This term includes all associated piping and ancillary equipment. This term does not include a dispenser system; septic tank system; surface impoundment, pit, pond or lagoon; stormwater or wastewater collection system; flow-through process tank system; or liquid trap or associated gathering lines directly related to oil or gas production and gathering operations. (CBS definition at 6 NYCRR 596.1(53)).
Underground tank system or UST system	A tank system that has ten percent or more of its volume beneath the surface of the ground or covered by materials. This term does not include a tank system situated in an "accessible underground area" such as a basement, cellar, shaft, or vault – that allows for the physical inspection of the exterior of the tank. (CBS definition at 6 NYCRR 596.1(58)).
Working capacity	The portion of the design capacity of a tank that may be filled before engaging the overfill prevention device, reduced by an allowance for freeboard and petroleum expansion.

1.0 Introduction

This Guide will help you prepare to take the New York State Class A and/or Class B Operator exam. Successfully passing the exam will authorize you to operate underground storage tanks (USTs) at facilities registered in New York State (NYS).

Note: Because most NYS registered facilities store petroleum, this Guide is focused on petroleum bulk storage (PBS) tank systems. While much of this information also applies to chemical bulk storage (CBS) facilities, there are important differences, particularly for registration, inspections, annual evaluations, spill response plans, and tank system compatibility. In addition, each of the dozens of regulated chemicals has unique safety and compatibility requirements. Therefore, in addition to learning the basic information in this Guide, it is important that CBS operators be trained on the procedures and requirements for the specific chemicals stored at each facility at which they are authorized.

At a minimum, all Class A and B Operators must understand the general requirements for CBS tank systems described in Chapter 19.

1.1 Why Does New York Require UST Operator Testing?

Leaks from USTs can seep into the soil and contaminate groundwater, the source of drinking water for nearly a quarter of all New Yorkers. Spills, leaks, and overfills can also flow into lakes, rivers, and streams where the oil or chemicals can harm people and the environment, including wildlife, fish, and plant life.

For several decades, up into the mid-1980s, most USTs were single-walled, bare steel tanks, often installed with unprotected metal piping. As these systems aged, releases due to corrosion and overfills of these tank systems became widespread and caused impacts so serious that both New York State and the federal government passed laws to set operating requirements and tank construction standards to protect human health and the environment. Thousands of tanks were upgraded or replaced, usually with double-walled tanks made of fiberglass or protected steel and equipped with methods for detecting unseen leaks and preventing overfills.

This Guide will help you prepare to take the New York State Class A and/or Class B Operator exam. Successfully passing the exam will authorize you to operate underground petroleum and chemical storage tanks at facilities registered in New York State.

However, good equipment only prevents leaks and spills IF it is operated and maintained properly. While the number of spills has decreased, thousands of spills are still reported each year in New York alone, often due to improper tank system management. In 2008, a new state law required that tank operators be trained to properly operate, maintain, and document their systems. The law also gave New York State the authority to prohibit deliveries to tanks that are in serious noncompliance with regulatory requirements.

The New York State Department of Environmental Conservation (DEC) has developed regulations to implement the requirements for PBS and CBS UST operator training. No later than October 11, 2016, facilities with underground petroleum or chemical storage tanks that are subject to New York State and federal regulation must designate at least one Class A, one Class B, and one Class C Operator for those tanks. If you wish to become a Class A and/or B Operator, you must pass an exam administered by DEC. Alternatively, you may qualify for authorization by obtaining credentials issued by any state program recognized by the U.S. Environmental Protection Agency (EPA) as meeting operator training grant guidelines.

Along with the new regulations, DEC has developed this Guide to help you prepare for the New York State exam, but you may use whatever training materials you choose.

DEC will not review third-party training materials, nor will it require third-party trainers to be certified or otherwise approved. Passing the exam demonstrates that you have the basic knowledge required for proper operation of USTs. However, you must also become familiar with the details of the tank systems and operations at your own facility so that you can operate, maintain, and document that the systems are in compliance with regulatory requirements.

1.2 Applicability

The requirement to have authorized operators applies to USTs at PBS facilities regulated under 6 NYCRR 613-2 and USTs at CBS facilities regulated under 6 NYCRR 596-599. These include facilities that have petroleum USTs with individual capacities of more than 110 gallons. There are exceptions for certain USTs that:

(1) contain heating oil used for onsite consumption;

(2) have a design capacity of 1,100 gallons or less and are used to store motor fuel for non-commercial purposes (not for resale) at a farm or residence;

(3) are part of an emergency generator system at nuclear power generation facilities; OR

(4) are field constructed (i.e. are built onsite).

Leaks from underground storage tanks (USTs) can seep into the soil and contaminate groundwater, the source of drinking water for nearly a quarter of all New Yorkers.

While the number of spills has decreased, thousands of spills are still reported each year in New York alone, often due to improper tank system management.

Chapter 4 provides more details on the definition of a regulated PBS facility. Chapter 19 provides information on CBS facilities.

1.3 Training and Testing: Timing Requirements

Class A Operators have primary responsibility for operation and maintenance of UST systems. These operators typically manage resources and personnel to maintain compliance. Training for Class A Operators should help the operator make informed decisions regarding compliance with regulatory requirements.

Class B Operators have daily responsibility for onsite operation and maintenance of UST systems. Training for Class B operators should provide an in-depth understanding of operation and maintenance aspects of UST systems.

Class C Operators are onsite individuals who are generally the first line of response to actual or potential emergencies. The Class C Operator must be trained to take appropriate action in response to UST-related emergencies or alarms caused by spills or leaks from an UST system.

A person may be designated to more than one operator class as long as they are properly trained and authorized in each operator class for which they are designated.

New facilities must designate operators when they commence operation. Class A and B Operators at those facilities then have 30 days to become authorized. Class C Operators must be trained before they are designated.

Facilities where operator training is required and that are already operating on October 11, 2015 will have until October 11, 2016 to designate authorized operators and for those operators to train Class C Operators.

1.4 Operator Testing Requirements

Class A and B Operators must pass the DEC exam. DEC will also accept valid operator training verification issued by another state (i.e., reciprocity) that is recognized by EPA as meeting operator training grant guidelines. Class A and B authorization does not expire unless revoked by DEC due to significant noncompliance with regulatory requirements.

Class C Operators must be trained by a Class A or B Operator; their knowledge must be assessed and the training must be documented, but a written exam is not required. Class C Operator training does not expire, but it is good practice for the Class C Operator to periodically receive refresher training.

Class A Operators have primary responsibility for operation and maintenance of UST systems.

Class B Operators have daily responsibility for onsite operation and maintenance of UST systems.

Class C Operators are onsite individuals who are generally the first line of response to actual or potential emergencies.

1.5 Red Tags – Regulatory Consequences of Releases or Serious Deficiencies

Certain serious problems at your site may cause DEC to prohibit deliveries of product to your tanks. The prohibition is known as red-tagging because DEC will attach a tag to the tank fill pipe to notify fuel suppliers that they may not deliver fuel to that tank.

The most serious problems, known as Tier 1 conditions, will result in the tank being tagged when the problem is discovered. Tier 1 conditions include a tank system that is known to be releasing petroleum, or a tank system that is missing required:

- secondary containment;
- spill and overfill prevention;
- corrosion protection; or
- leak detection.

Tier 2 conditions may result in DEC tagging the tank after written notification to the facility. These conditions include:

- leak detection results that indicate the tank system may be leaking, or would not contain a leak if one occurred; or
- failure to comply with standards for secondary containment, spill/overfill prevention, corrosion protection, or leak detection within 30 days following written notice from DEC.

Delivering fuel to a red-tagged tank or tampering with the tag is illegal and may result in enforcement actions including substantial fines. For additional information about the red tag process, see Subpart 613-5 of the PBS regulations. Complete PBS regulations are at 6 NYCRR 613 of New York's regulatory code. The complete CBS regulations are at 6 NYCRR 596-599. See Section 20.0 for links to the regulations online.

Disclaimer: The information in this Guide can help you keep your tank system running in compliance with regulatory requirements, but it is NOT a substitute for the regulations.

1.6 Summary

- Your responsibility as a tank operator is to prevent releases of petroleum products or harmful chemicals to the environment and to keep your facility in regulatory compliance.

Certain problems at your site may cause DEC to prohibit deliveries of product to your tanks.

The information in this Guide can help you keep your tank system running in compliance with these regulatory requirements.

- By October 11, 2016, every regulated facility where operator training is required must designate one Class A and Class B Operator, and one or more Class C operators.
- Class A Operators have primary responsibility for operation and maintenance of the UST system.
- Class B Operators have daily responsibility for onsite operation and maintenance of UST systems.
- Class C Operators are onsite individuals who are generally the first line of response to actual or potential emergencies.
- Class A and B Operators must pass the DEC exam or an exam administered by another state recognized by EPA as meeting operator training grant guidelines.
- Class C Operators are trained by a Class A or B Operator. Class C Operators must have their knowledge assessed, and their training must be documented, but a written exam is not required.
- Certain serious problems at your site may cause DEC to prohibit deliveries of product to your tanks.
- The information in this Guide can help you keep your tank system operating in compliance with regulatory requirements, but it is not designed to replace the regulations.
- Class A and B Operators must understand the general requirements for CBS tank systems described in Chapter 19.
- It is important that CBS operators be trained on the specific procedures and requirements for each facility at which they are authorized.

Your responsibility as a tank operator is to help prevent releases of petroleum products or harmful chemicals to the environment and to help keep your facility in regulatory compliance.

2.0 Operator Training Requirements and Deadlines

Your responsibility as a tank operator is to prevent releases of petroleum or harmful chemicals to the environment and to help keep your facility in regulatory compliance. Tank operator duties are shared between three classes of operators, designated as Class A, Class B, and Class C. Facilities with USTs that are subject to federal and state regulation (see Chapter 1) must have at least one operator from each class, although a person may be designated to more than one operator class as long as they are properly trained and authorized in each class for which they are designated.

2.1 Class A Operator

Class A Operators have primary responsibility for operation and maintenance of the UST system. These operators typically manage resources and personnel to maintain compliance.

Class A Operators must understand how tank systems work and know the related regulatory requirements with respect to:

- spill and overfill prevention;
- leak detection;
- corrosion protection;
- emergency response;
- compatibility;
- financial responsibility;
- registration;
- out-of-service/temporary closure and permanent closure;
- recordkeeping;
- environmental and regulatory consequences of releases; and
- knowledge and training requirements for Class B and Class C Operators.

Purpose of Operator Training (613.1-1)

- The purpose of tank operator training is to protect human health and the environment.
- Facilities with USTs that are subject to federal and state regulation must designate at least one Class A, Class B, and Class C Operator for those tanks.
- Class A and B Operators must pass an exam administered by DEC or obtain credentials issued by any state program recognized by EPA as meeting operator training grant guidelines.
- DEC may require Class A or B operators to be retested if their system is found to be in significant noncompliance.

2.2 Class B Operator

Class B Operators have daily responsibility for onsite operation and maintenance of UST systems. They must understand how tank systems work and know the related regulatory requirements with respect to:

- Operation and maintenance;
- Spill and overfill prevention;
- Leak detection and related reporting;
- Corrosion protection and related testing;
- Emergency response;
- Compatibility;
- Recordkeeping;
- Environmental and regulatory consequences of releases; and
- Training requirements for Class C Operators.

Figure 2.1: Operator opening a tank top sump. Class A and B operators are responsible for tank maintenance and monitoring

2.3 Becoming an Authorized Operator

Individuals who wish to become authorized Class A and/or B Operators must:

- pass an online exam administered by DEC (also may be taken in person, by request); OR
- obtain credentials issued by any state program recognized by the EPA as meeting operator training grant guidelines.

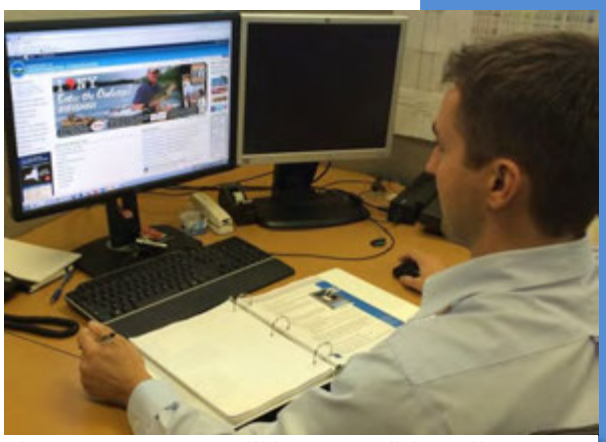


Figure 2.2: Exams will be accessible online

For online exams, applicants must register online and provide the requested information, such as their name, mailing address, email address, and phone number. The online version of the exam will be continuously accessible.

DEC will also provide opportunities to take the exam on a computer or in a "paper-and-pencil" format at a DEC office (i.e., certain Regional Offices and Central Office in Albany). All such exams will be proctored. Refer to DEC Program Policy DER-40 for more details.

All exam candidates (both online and in-person) will need to confirm their identities and affirm that they were not assisted with taking the exam, that they were not provided exam questions in advance, and that they will not provide exam questions to others.

The exam will be open book and must be completed within the allotted time. Candidates will be able to answer exam questions based on information available in this Guide and the regulations, but exam questions will not directly mirror the Guide or regulatory language. Some questions will require critical thinking by the applicant.

Candidates seeking authorization:

- exclusively as Class A Operators will need to answer approximately 65 questions;
- exclusively as Class B Operators will need to answer approximately 50 questions; or
- as combination Class A/B Operators will need to answer approximately 80 questions.

DEC will not charge for access to guidance materials or for taking the exam.

The exam will be designed to reflect the varying complexity of the topics and importance in preventing releases. Emphasis will be given to questions in the following subject areas:

- tank system basics,
- overfill prevention,
- tank leak detection,
- piping leak detection,
- corrosion protection and related testing,
- spill containment,
- UST system record keeping, and
- operation and maintenance.

The following subject areas will be less heavily emphasized:

- tank registration,
- financial responsibility,
- out-of-service/temporary closure and permanent tank closure,
- inventory monitoring,
- dispensers,
- spill reporting and response actions,
- product and equipment compatibility, and
- training of Class C Operators.

All exam candidates must affirm that they were not assisted with taking the exam, that they were not provided exam questions in advance, and that they will not provide exam questions to others.

Department of Environmental Conservation

Underground Storage Tank Systems
Operator Authorization

THIS IS TO CERTIFY THAT PURSUANT TO
THE PROVISIONS SET FORTH IN 6 NYCRR 613-2.5 AND 6 NYCRR 596.12

Operator Name

IS DULY AUTHORIZED AS A

CLASS A/B OPERATOR

OF

UNDERGROUND STORAGE TANK
(UST) SYSTEMS

THAT ARE SUBJECT TO
TITLE 18 OF ARTICLE 17 OF THE ENVIRONMENTAL CONSERVATION LAW
OR ARTICLE 40 OF THE ENVIRONMENTAL CONSERVATION LAW
IN THE STATE OF NEW YORK

April 1, 2015 — Date

XYZ-123 — Authorization Number

SAMPLE

Figure 2.3: Sample Operator Training Certificate

Exams taken online will be automatically scored, with results provided to candidates immediately upon completion of the exam. Candidates who pass will be given the opportunity to print a document identifying them as an authorized UST operator (Class A, Class B, or combination Class A/B) in New York State. The document will be dated and uniquely numbered. Candidate information will be stored in DEC's operator training database.

Paper exam results will be manually entered into the database by DEC Central Office staff. Results of paper exams should be mailed to candidates within 30 days after the exam date.

Examinees who do not pass an online exam may retake it, but must wait 24 hours between failing an exam and retaking that exam or taking any other operator class exam. Examinees may take no more than three exams (whether passed or failed) in a rolling six-month period.

Reciprocity

DEC will accept valid operator training credentials issued by another state without requiring operators to pass the DEC exam. Credentials issued by any state program recognized by EPA as meeting operator training grant guidelines will be accepted.

2.4 When Do I Need To Be Authorized?

Initial Authorization

For facilities with UST systems that require an authorized operator and that were installed prior to October 11, 2015:

- owners must designate Class A and Class B Operators by October 11, 2016; AND
- operators must become authorized by DEC by October 11, 2016.

For facilities with UST systems that require an authorized operator and that were installed on or after October 11, 2015:

- owners must designate Class A and Class B Operators at the time of facility registration; AND
- operators must become authorized by DEC within 30 days after being designated.

Tank owners must keep facility registration information current with respect to designated Class A and Class B Operators.

Tank owners must keep facility registration information current with respect to designated Class A and Class B Operators.

Retesting as Result of Noncompliance (613-2.5(e))

Authorized operators are not required to be retested unless DEC finds significant noncompliance at one or more UST systems where the operator has been designated. (Chapter 1 has additional information on significant noncompliance.) If DEC finds a facility to be in significant noncompliance, the operator must be retested by taking the NYS exam regardless of how the operator was previously authorized.

Operators who need to be re-authorized may use any training method they desire. They must retake and pass the exam for the operator class for which they wish to be authorized.

Operators must complete the exam within 30 days after being notified by DEC that re-authorization is required. If the operator is unable to complete the exam online and the next in-person exam offering is more than 30 days after the time of being notified by DEC, the operator must contact DEC for an extension.

If no extension is given or the operator does not achieve a passing score on the exam, the tank owner must designate a new operator within 30 days after being notified of the need for re-authorization.

If DEC observes that a Class A or Class B Operator is authorized at one or more facilities with continual noncompliance issues, DEC may revoke that operator's authorization for a specified period of time.

Authorized operators are not required to be retested unless DEC finds significant non-compliance at one or more facilities where the operator has been designated.

2.5 Class C Operator

Class C Operators are onsite individuals who are generally the first line of response to emergencies resulting from a spill or release from a UST. Class C Operators are not required to pass an exam. However, you must teach your Class C Operators the emergency procedures they need to follow at your facility and verify that they understand and can implement those procedures. Chapter 18.0 has additional information on training and documenting Class C Operators.

Figure 2.4: Class C Operators are often the clerks at convenience stores

Authorized Class A or Class B Operators are responsible for:

- ensuring that Class C Operators are trained in emergency response procedures specific to their facility before being designated;

- maintaining evidence of the required training of all Class C Operators at their facility, as well as their subsequent assessment of knowledge;

  AND

- producing evidence of the training of all Class C Operators at a facility upon request.

Although re-training Class C Operators is not required, it is a good idea to check their knowledge of emergency procedures from time to time by asking questions such as: "What should you do if the monitoring system alarms?", "Where is the emergency shut-off, and when should you activate it?", or "Where do we keep the tank records?".

2.6 Documentation

Every facility that is required to have authorized operators must maintain a list of their designated Class A, Class B and Class C operators.

The list must:

- identify each Class A, Class B and Class C operator at the facility for as long as the operator is designated AND for an additional 3 years; and
- include the name of the operator, class of the operator, date that the operator was designated, date the operator initially completed testing or training and the date of any retesting. In addition, all Class C operator records must include the name and authorization number of the Class A or B Operator that trained them.

Records verifying completion of testing, training or retesting must be recorded on paper or electronically for all operator classes. Operator authorization number should also be added to any list of designated Class A or B Operators. Operator authorization number should also be added to the list of designated Class A or B Operators.

2.7 Operator Database

DEC will make the list of currently authorized operators available online on its website. This information will be limited to operator name, identification number, and authorization date.

If re-authorization is required for designated operators, then DEC will remove the name of the operator from the list until the operator has completed the re-authorization process.

2.8 Retirement of Authorization

Operator authorization does not expire unless the operator is found to be associated with a

Every facility that is required to have authorized operators must maintain a list of their designated Class A, Class B and Class C operators.

facility in significant noncompliance. When an operator decides to stop serving as an authorized operator in New York State (i.e., out-of-state relocation, change in career, or retirement), the operator may voluntarily request that their authorization as a Class A and/or Class B Operator be retired.

2.9 Summary

- Your responsibility as a tank operator is to prevent releases of petroleum or harmful chemicals to the environment and to help keep your facility in regulatory compliance.
- Tank operator duties are divided between three classes of operators, designated as Class A, B, and C.
- Each facility that is required to have authorized operators must have at least one operator from each class, although a person may be designated to more than one operator class as long as they are properly trained and authorized in each class for which they are designated.
- Class A Operators have primary responsibility for operation and maintenance of the UST system. These operators typically manage resources and personnel to maintain compliance.
- Class B Operators have responsibility for onsite operation and maintenance of UST systems.
- Individuals who wish to become authorized Class A and/or B Operators must:
    - pass an exam administered by DEC; or
    - obtain credentials issued by any state program recognized by EPA as meeting operator training grant guidelines.
- Class C Operators are onsite individuals who are generally the first line of response to emergencies resulting from a spill or release from a UST. You must teach your Class C Operators the emergency procedures they need to follow at your facility and verify that they understand and can implement those procedures.
- The exam will be open book and the guidance materials will be available free of charge.
- Candidates will be able to answer exam questions based on information available in this Guide and the regulations, but exam questions will not directly mirror the Guide or regulatory language. Some questions will require critical thinking by the applicant.

- Authorized operators are not required to be retested unless DEC finds significant noncompliance at one or more UST systems for which the operator has been designated.
- If DEC observes that a Class A or Class B Operator is authorized at one or more facilities with continual noncompliance issues, DEC may revoke that operator's authorization for a specified period of time.
- DEC will make the list of currently authorized operators available online on its website. This information will be limited to operator name, identification number, and authorization date.

3.0 Tank System Basics

The purpose of this section is to help you:

- identify the key components of your UST system;
- understand how each component works; and
- understand the regulatory requirements for tank operation and maintenance throughout the rest of this training course.

This is an introductory discussion only, and does not include every possible component or design. For additional information on tank systems, see the references provided in Chapter 20.0.

USTs are petroleum storage tanks that are 10% or more underground. Tanks located in underground vaults, but with all sides visible for inspection, are not considered USTs. While each UST facility is unique, all systems consist of common components that allow for the storage, delivery, monitoring and dispensing of petroleum.

USTs store petroleum products underground. The tank holds product at atmospheric pressure, meaning at the same pressure as the air around us. All tanks have a fill pipe to bring product into the tank and a suction or pressurized piping system to take product out. All tanks also have a vent line to allow the tank to "breathe" by relieving tank pressure. Figure 3.1 illustrates these concepts.

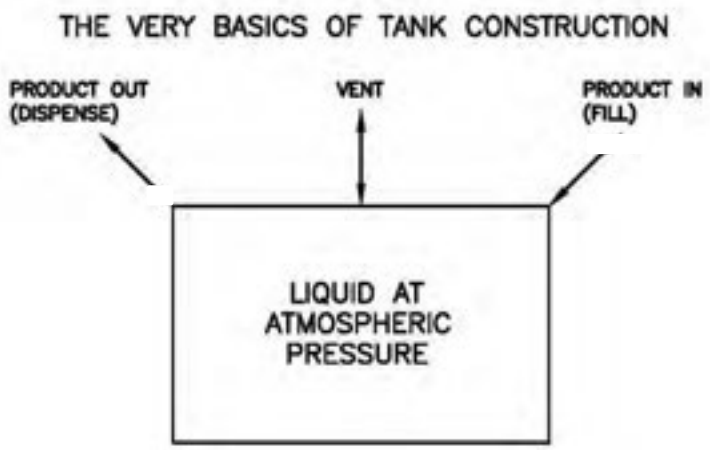


Figure 3.1 Basics of Tank Construction

Tank System Knowledge

- Know your UST system to prevent spills.
- Maintain the various components of your UST system to ensure proper operation.

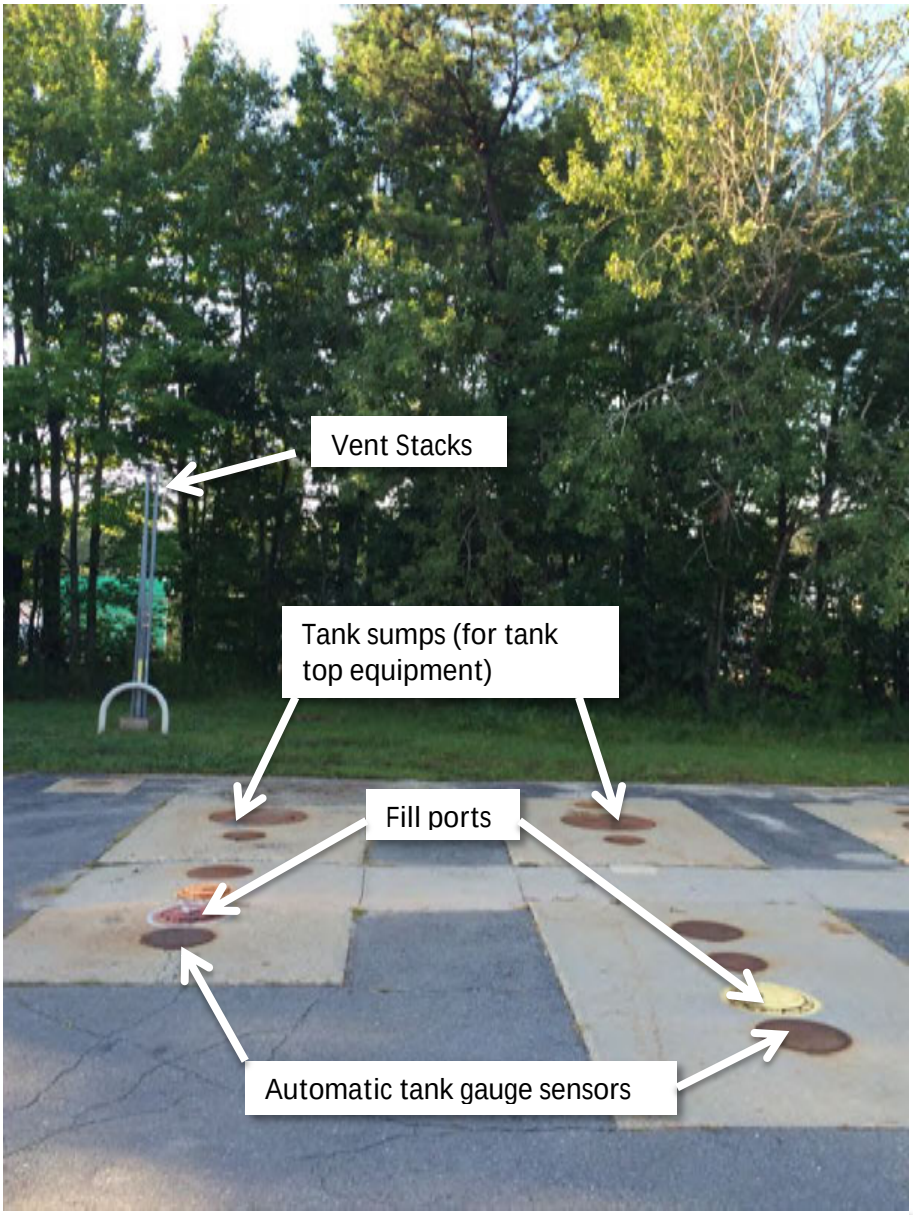


Figure 3.2:Typical tank top layout

USTs are equipped with threaded fittings, also known as bungs, that provide access to the tank for various purposes. Bungs are used to fit UST accessories such as fill ports, automatic tank gauging systems, submersible or turbine sumps, product piping, vapor recovery ports, and vents. These devices are typically accessed through containment sumps, manholes or other access covers. Not all tank top bungs are accessible from the ground surface. Vent lines and suction lines may terminate at the tank without access to the surface.

USTs are generally buried 3-4 feet beneath the surface. Tanks are typically located beneath a concrete pad; but they may also be buried under gravel, grass or other materials. Figure 3.2 is a photo of a typical UST layout.

Most UST systems contain the following items:

- Tank(s)
- Tank containment sump
- Product piping
- Vent
- Vapor recovery port
- Tank fill port (with spill bucket)
- Interstitial inspection port
- Dispenser(s)
- Dispenser containment sumps
- Alarms, sensors and electronic monitoring console

This equipment will be explained in more detail later in this chapter and in subsequent chapters. Figure 3.3 illustrates a typical underground layout and elevation of a tank system.

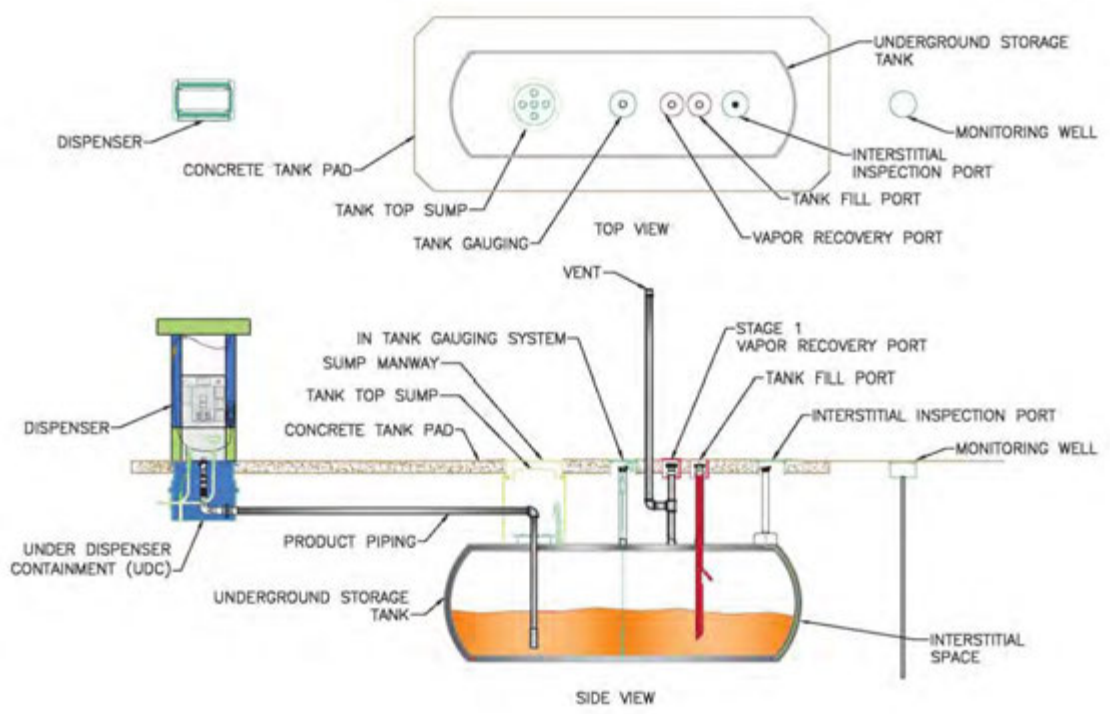


Figure 3.3: Tank top layout and elevation

3.1 Tank System Categories According To Installation Dates

The DEC PBS regulations divide UST systems into three distinct categories:

Category 1 Tank System: Any tank system whose tank was installed before December 27, 1986.

Category 2 Tank System: Any tank system whose tank was installed between December 27, 1986 and October 11, 2015.

Category 3 Tank System: Any tank system whose tank was installed after October 11, 2015.

Different regulatory requirements may apply to tanks in different categories.

3.2 Tank Construction

USTs are either single- or double-walled. Single-walled tanks consist of a single, primary tank. Double-walled tanks, by comparison, consist of two tanks – a primary tank surrounded by a secondary tank – separated by an interstitial space (also known as the interstice). The purpose of the secondary tank is to prevent a release into the environment in the event of a leak within the primary tank.

In a double-walled tank, the interstitial space is the space between the primary tank wall and the secondary tank wall. It can be fitted with a leak detection system to detect leaks in the primary or secondary tank, and is normally accessed through an inspection port in the tank pad. See Figure 3.3 to learn where you can expect to find an interstitial monitoring port. Chapter 9.0 has more information about interstitial monitoring.

In addition to single- and double-walled design, USTs may be constructed from a variety of materials, as summarized below.

Fiberglass Reinforced Plastic (FRP)

A fiberglass-reinforced plastic (FRP) UST may be single- or double-walled. FRP is commonly used because it is corrosion resistant and durable in underground environments. FRP tanks meet corrosion protection requirements without any extra equipment or operating requirements.

Figure 3.4: Double-walled FRP tank ready for installation

Jacketed Steel

Jacketed steel tanks are steel tanks that are enclosed by a non-corrodible, nonmetallic material such as fiberglass, plastic or urethane. The tanks are constructed with a space between the steel wall and the jacketed material where the tank can be monitored for leaks. A cut-away view of a jacketed steel tank is shown in Figure 3.5.

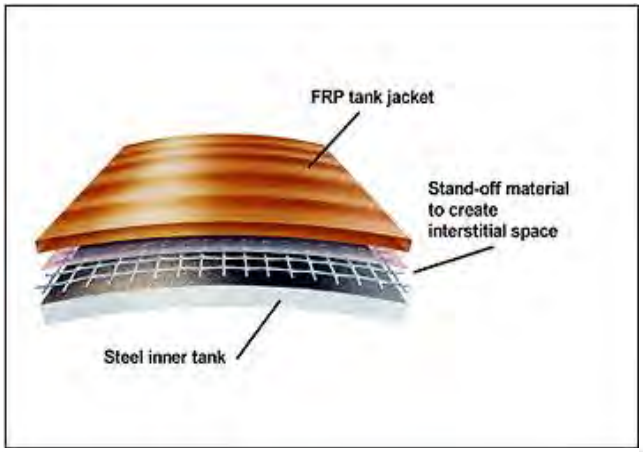


Figure 3.5: Jacketed steel UST

Steel Tank with Dielectric Coating and Cathodic Protection

Steel tanks may also be protected from corrosion by a factory-installed corrosion resistant coating and cathodic protection (impressed current or sacrificial anodes – see Chapter 11). Tanks that meet the Steel Tank Institute sti-P3 specification are common examples of this type of design. These tanks have dielectric bushings at tank openings to provide electrical isolation of the tank from piping or other components. "Dielectric" means a material that does not conduct direct electrical current. A corrosion resistant coating is installed on the outer tank wall. Anodes are then attached to the outer tank to prevent corrosion.

Figure 3.6: STP-P3 tank

Steel Tanks with Internal Lining and Cathodic Protection

Internally lined steel tanks are steel tanks that have a spray-on lining inside the tank to prevent internal corrosion. Sacrificial anodes or an impressed current system are installed outside the tank to prevent corrosion on the exterior of the tank. See Chapter 11 for more corrosion protection information.

Figure 3.7: Worker spraying a lining on a cathodically protected tank

Clad Steel Tanks

A clad steel tank consists of a steel tank with a thick layer of non-corrodible material, such as fiberglass or urethane bonded to the outside. There is no interstitial space between the steel tank and the non-corrodible coating.

3.3 Tank Configurations

Tanks or piping systems may be configured in different ways. Knowing if there are connections and how those connections are configured is important. Those configurations determine how the tank is registered and what type of leak detection system must be used. If product can move between your tanks, if the dispensing piping from two or more tanks is connected, or if your system blends different grades of fuel together, you must have a leak detection system and inventory reconciliation method that can properly account for the effects of these connections

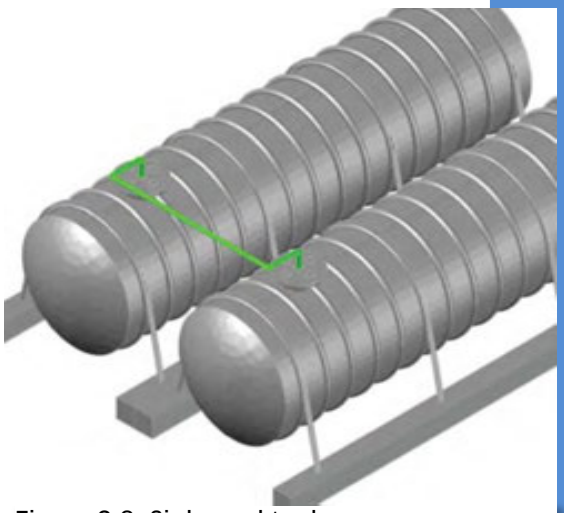


Figure 3.8: Siphoned tank

Manifolded/Siphoned Tanks

In this configuration, two or more tanks are connected together by a siphon, which is a pipe connected to two tanks of the same product. The siphon uses gravity to allow product to move from one tank to the other as product levels change. Siphoned tanks will tend to maintain the same product level, as gravity will force product in the tank with a higher level into the tank with a lower level.

There are some important things to remember about manifolded/siphoned, tanks:

- Product usually moves between the tanks slowly. As such, the siphon pipe cannot move product as fast as the rate of delivery from a truck, generally meaning that the delivery vehicle will still have to connect to both tanks when delivering to both tanks.

- When tanks are manifolded, the total amount of product that can be released from a failure in one of the tanks is the total volume of BOTH tanks. This means that the two tanks manifolded together tend to behave like a single tank.
- If in-tank leak detection methods are used, the monitoring system has to be programmed so that the leak detection system treats the two tanks as a single, large tank.
- Siphons have to initially be *primed* to work. This means that a priming tube must be connected to the submersible pump to create suction and draw fuel into the pipe. If the siphon line has any air leaks, or it is not properly primed, the siphon/manifold will not work properly.

Manifolded Piping

In a system with manifolded piping, the pipes leaving two or more tanks containing the same product are connected after the product leaves the submersible pumps. In this type of system, two or more tanks, each with a submersible pump, supply a single combined pipe that leads to the dispensers. Depending on the system, one pump may operate at a time or both may operate together.

There are some important things to remember about manifolded piping systems:

- Unlike the manifolded/siphoned tank configuration, when the piping system is manifolded, the total amount of product that can be released from a failure in one of the tanks is not affected by the manifold, and therefore the contents of the tank do not passively communicate. As such, the two tanks behave like two independent tanks, in that the tank volumes are not combined when in the tanks.
- Submersible pumps in pressurized piping systems require automatic line leak detectors. Because those leak detectors service a common pipe in manifolded piping systems, the leak detectors must be carefully selected and configured to ensure that they operate at the proper threshold.
- Because fuel from two or more tanks serves the same dispensers in this configuration, inventory reconciliation calculations will have to account for fuel as if it is coming from a single tank.

Blending Systems:

Vehicle fuel dispensers may dispense multiple grades of product, such as low-grade, mid-grade, and high-grade gasoline. Often, to avoid having a third tank, the mid-grade fuel is a blend of the

low- and high-grade products. The low- and high-grade products are piped from different tanks and blended inside the dispenser. Blending systems do not involve the connection of tanks or piping systems (except at the dispenser), so the tank and piping leak detection systems are not affected. A blending configuration, however, will affect how inventory reconciliation calculations are performed.

Compartmented Tanks

Compartmented tanks are constructed with dividers (typically single-walled) to create two or more separate sections within the primary tank. Each section is called a compartment. Compartmented tanks are most commonly used to separate grades of gasoline. Each compartment must be listed as a separate tank on the facility registration. Typically each compartment in a given tank has the same number followed by individual letters ("1A", "1B", etc.).

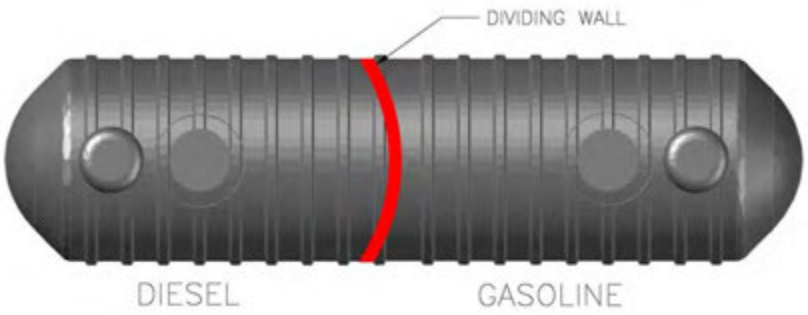


Figure 3.9: Compartmented tank

Tank Top Equipment

The equipment discussed in this section is commonly found on the top of USTs. Figure 3.10 shows the top of several typical gasoline USTs before they are covered with soil.

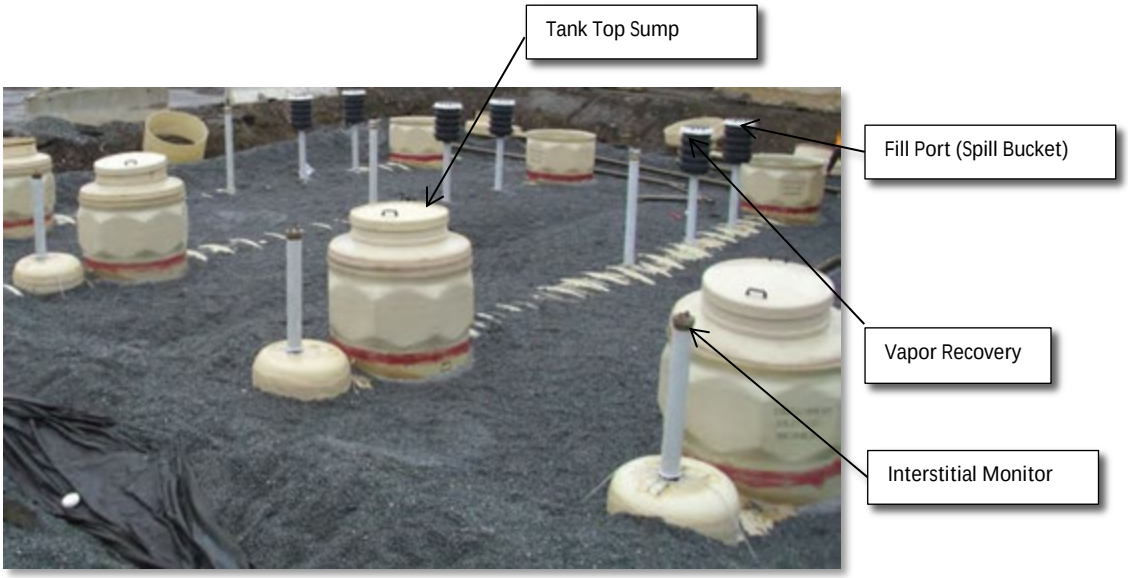


Figure 3.10: Common service station UST layout

Properly maintain all tank top equipment

Tank Top Sumps

Tank top sumps are usually accessed through covers in the tank pad and contain a variety of equipment. Typical sumps range from 2 to 4 feet in diameter and can be round, oval, square or rectangular.

Figure 3.11 shows a typical tank top sump layout, with the following equipment:

1. submersible or turbine pump,
2. product piping,
3. tank top sump sensors,
4. product line leak detector, and
5. automatic tank level gauge.

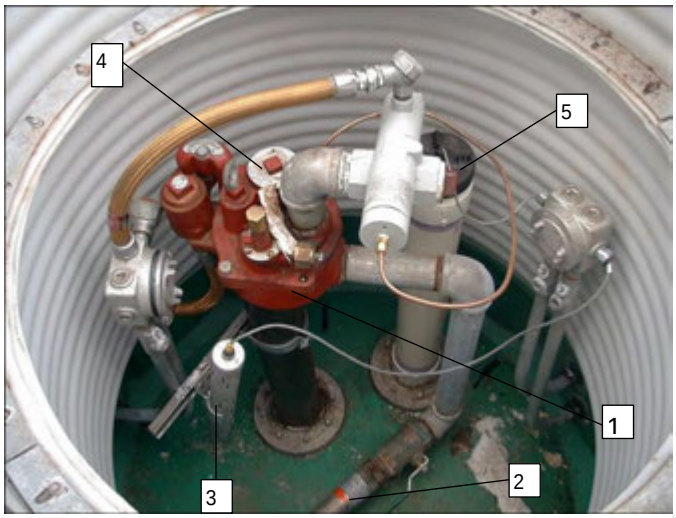


Figure 3.11: Typical tank top sump (refer to bullet list in text for numbered items)

Figure 3.12:Product from double-walled piping collecting in a tank top sump

Most tank top sumps are contained sumps with integrated sides and bottom that are liquid-tight. Contained tank top sumps will keep any petroleum leaks from entering the environment and protect the components from corrosion by isolating them from the surrounding soil.

Double-walled piping systems are designed so that leaks in the piping will flow back to the tank top sump or the dispenser sump. Figure 3.12 shows a tank top sump containing product. Product in your sump means that you may have a leak in your primary piping. Water in the sump may mean that you have a leak in your secondary piping, or it could be a sign of a leak in the sump or sump cover seals.

Looking in your tank top sump can help you determine whether you have a pressurized or

Figure 3.13: Suction piping system

Figure 3.14: Pressurized piping system

suction piping system.

A suction piping system has a pump located inside the dispenser. The pump in the dispenser draws product from the tank by suction. When you look into your tank top sumps, you will find product piping but no pump (Figure 3.13).

A pressurized piping system has a submersible turbine pump inside a tank, with the pump head visible in a tank top sump. The submerged pump will pump product to your dispenser. When you look into your tank top sumps you will find product piping and a submersible turbine pump head (Figure 3.14).

Dispensers

Dispensers deliver product to your customers. They are part of either a pressurized or suction system. Figure 3.15 shows a dispenser (left side) that is part of a suction system. You can see the suction pump located inside the dispenser.

The right-hand photo in Figure 3.15 shows a dispenser that is part of a pressurized system. This dispenser does not house a suction pump because the dispenser is served by a submersible pump located inside the tank.

Figure 3.15: Suction system dispenser (left) and pressurized system dispenser (right).

Dispensers may also contain under-dispenser containment sumps (UDCs). UDCs are located under your dispenser and are designed to contain any leaks from the dispenser piping. UDCs are usually made of fiberglass, steel or HDPE (plastic). You will be able to see your UDC when you look down inside your dispenser cabinet. Dispenser sumps may also contain electrical conduit to the dispenser meter, product piping and fittings, and a sump leak sensor.

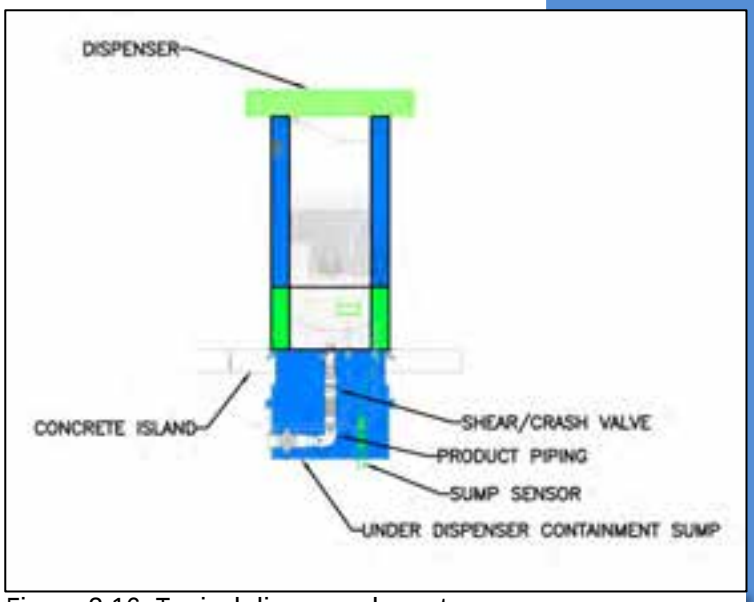


Figure 3.16: Typical dispenser layout

Motor vehicle fuel dispensers served by pressurized piping systems must also have a shear valve. This is also known as the emergency, impact, or crash valve. A shear valve is designed to stop product flow if a car strikes the dispenser or if a fire occurs at the dispenser. The shear valve location is shown in Figure 3.16. The valve must be properly anchored and installed at the correct height.

Spill Buckets

Spill buckets are used at fill ports to prevent small drips or spills from entering the environment. A spill bucket is a liquid-tight container that surrounds the fill port. Spill buckets are commonly located underground within the tank pad. They catch small leaks, drips or spills from the delivery hose that may occur during a delivery. Spill buckets must be able to contain spills from a leaky fill connection or drips when the delivery hose is disconnected. Spill buckets must be kept clean and dry. See Chapter 13: Spill Prevention for more information.

Figure 3.17: Spill bucket

Product Piping

It is important to know what type of piping your facility contains so that you can maintain and monitor it properly. This section describes common underground piping systems that may be present at your facility.

Single walled piping does not have a secondary outer wall or interstitial space. A leak from the pipe will be immediately released into the environment.

Double-walled piping is a pipe-within-a-pipe, or a pipe encased in an outer covering, with an interstitial space between the two pipe walls. The inner pipe is called the primary pipe (also known as the *carrier pipe*) and the outer pipe is called the secondary or containment pipe. Double-walled piping should be monitored for leaks with your leak detection system. Leaks from the primary or secondary piping will run back into your under-dispenser containment or tank top containment sump and can be detected by a leak sensor installed in the sump or by weekly visual checks.

Flexible piping is typically made of non-corrodible nylon or Teflon. The piping may be fitted with metal connectors. As long as any metal components are not in contact with soil, flexible piping meets corrosion protection requirements without additional equipment, operation or maintenance. Flexible piping can be either single- or double-walled.

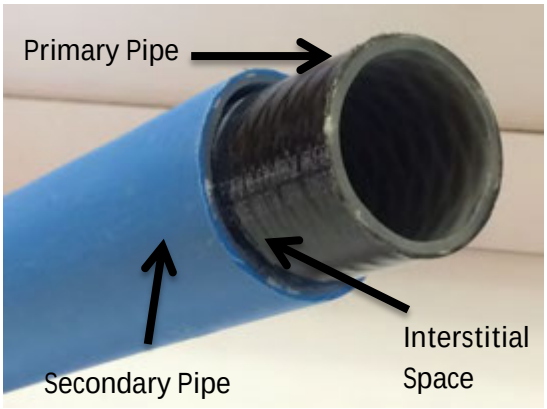


Figure 3.18: Double-walled flexible pipe

Figure 3.19: Flexible piping during installation

Steel piping must be equipped with a cathodic protection system to prevent corrosion of the piping by surrounding soils. Steel piping is usually single-walled, but double-walled steel piping is occasionally used.

FRP piping is constructed of non-corrodible fiberglass reinforced plastic (FRP) and may be either single or double-walled. FRP requires little maintenance and can be used with both pressurized and suction systems. The piping may be fitted with metal connectors and, as long as any metal components are not in direct contact with soil, meets corrosion protection requirements without additional equipment, operation or maintenance.

Figure 3.20: FRP piping during installation

Vent Lines

All underground tanks are vented. Venting protects the tank from damage by allowing air to flow in or out as the tank is filled or emptied of product or as atmospheric pressure changes. Venting also allows deliveries to proceed normally. Vent lines run underground from your tank to a vent stack which can be attached to a building or stand on its own.

Every vent stack will have a vent top cover. Pressure vacuum vent (P/V vent) caps are required for gasoline tanks. The P/V vent cap prevents vapors from escaping the tank until the tank reaches a pre-set pressure. When the tank reaches that pressure, the vent will open to allow your tank to breathe. Once the tank pressure equalizes, the P/V vent will close in order to minimize vapor loss. A P/V vent cap will also protect your tank against the intrusion of water, debris or insects.

Tanks containing semi-volatile products (diesel, motor oil, kerosene, etc.) can be vented with an open atmospheric vent cap. An open atmospheric vent cap has an internal wire screen and is designed to protect your tank and vent lines against the intrusion of water, debris or insects. The vent is always open to the atmosphere and will allow any pressure or vacuum in the tank to equalize.

Figure 3.21: Vent stack arrangement

Figure 3.22: P/V vent cap (left); Atmospheric vent cap (right) (Source: OPW)

Vapor Recovery

Vapor recovery systems are designed to prevent air pollution by stopping the escape of gasoline vapors from the UST system. Stage I systems operate during product delivery to the UST and are required only for gasoline storage tanks.

During delivery, the tanker truck operates two hoses. One hose delivers product to the tank, while the other hose takes vapors out of the tank and back to the truck. The vapor hose will typically have a Stage I vapor recovery adaptor on the end. The adaptor attaches to the vapor recovery riser pipe, which is typically accessible in a spill bucket. The adaptor creates a tight seal to prevent vapors from escaping and keeps water, dust and debris from entering the tank.

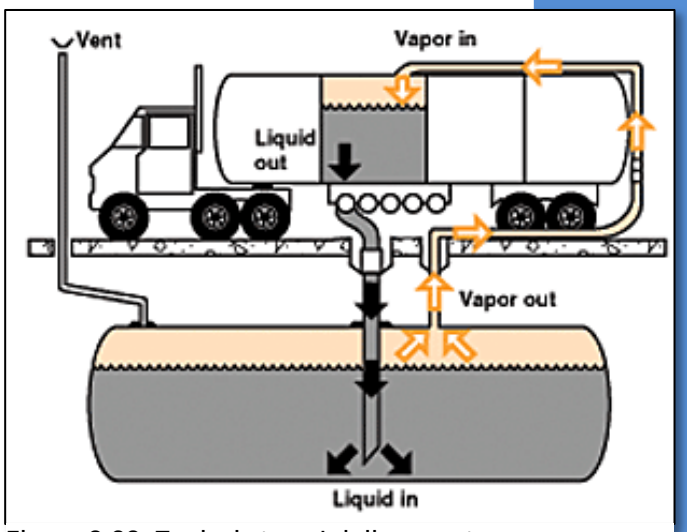


Figure 3.23: Typical stage I delivery set up

Figure 3.23 shows a typical set up for a Stage I vapor recovery delivery. The truck has a product hose attached to the tank to delivery, and a vapor recovery hose attached to remove the vapors.

Monitoring Wells

Monitoring wells are used to detect a release within the tank backfill, or the buried material surrounding an UST. Monitoring wells for leak detection are not common but you may have one at your facility. It is important to locate and properly mark your monitoring well to ensure product is not accidently delivered to it.

Monitoring wells should be painted white, with a black triangle.

It is important that the wells are secure and have locking caps. A monitoring well without a cap or cover can allow contamination or product to flow directly into the soil or groundwater. Monitoring wells cannot be used as a leak detection method where there is a history of spills or site contamination.

Figure 3.24: Monitoring well

Electronic Monitoring Systems

Electronic monitoring systems can be used to monitor UST systems for leaks. Monitoring systems typically consist of a console - the brain of an automatic tank gauging (ATG) system - attached to various sensors, probes and alarms. A typical monitoring system wiring layout is shown in Figure 3.27.

Figure 3.25: Typical monitoring system console

Automatic tank gauging (ATG) probes:

- measure product level in a tank;
- measure water level in a tank; and
- conduct in-tank testing.

Sensors:

- monitor dispenser sumps, tank sumps and interstitial spaces for the presence of liquid; and
- measure the level of the brine solution in a tank with a wet interstitial space.

Alarms indicate:

- overfilling of a tank;
- presence of a liquid in a sump or interstitial space;
- presence of water in a tank;
- low product level/whether a delivery is needed; and

Figure 3.26: Overfill alarm

- when the printer is out of paper

There are many types and models of monitoring systems. You should be familiar with your system. It is important that you understand what each alarm indicates and the reason for the alarm.

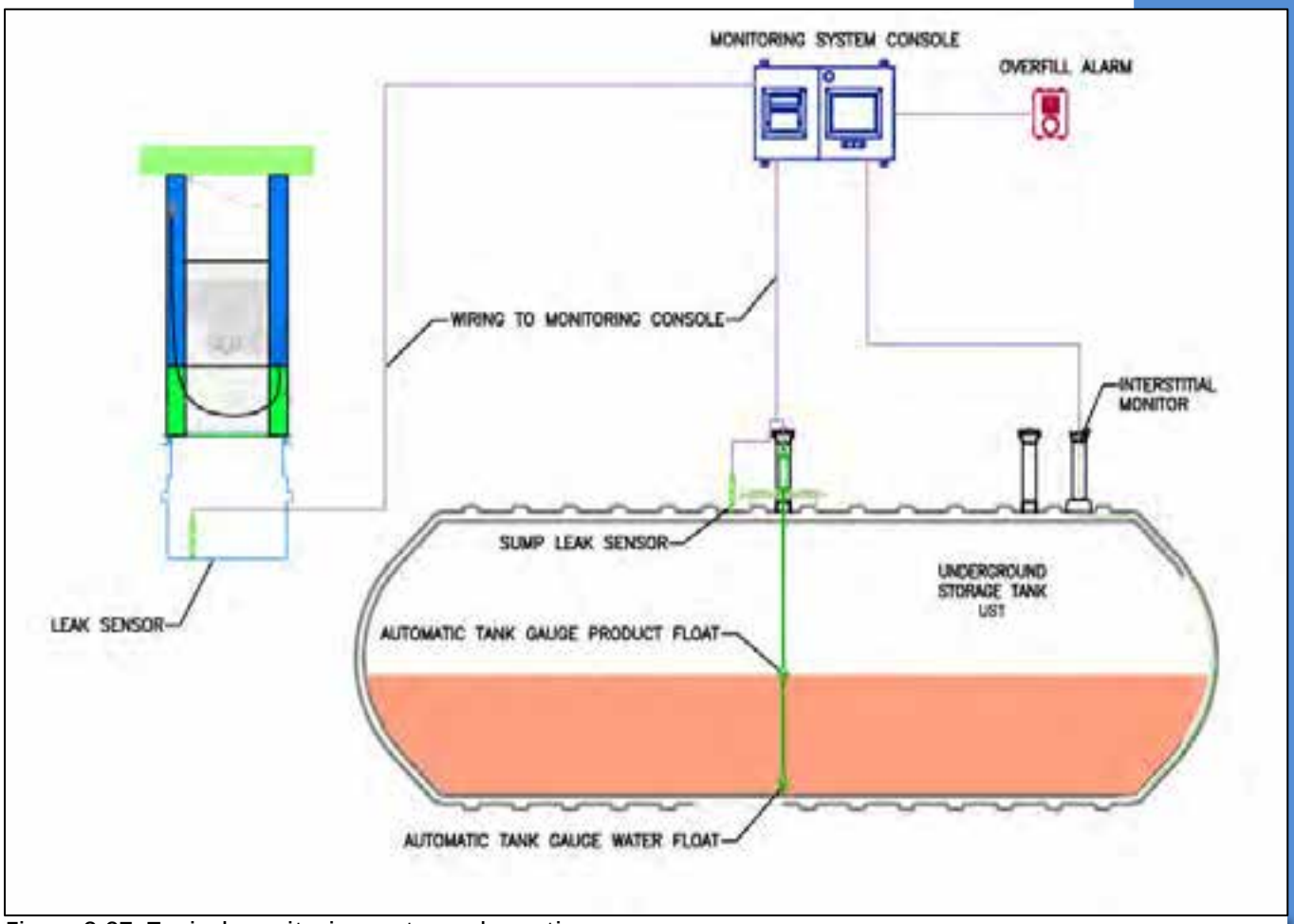


Figure 3.27: Typical monitoring system schematic

Emergency Stop (E-stop)

Facilities with pressurized product delivery (e.g. service stations with submerged turbine pumps) typically have an emergency stop (E-stop) system that allows an operator to shut off product flow by turning off power to the pumps. The E-stop is typically activated by an emergency switch or button. If you facility is subject to Fire Code of New York State requirements for motor fuel-dispensing facilities and repair garages, then you must meet the E-stop/emergency

disconnect switch installation criteria specified in the code regardless of whether you have a pressurized or suction system.

3.4 Documentation of Tank System Installation

For Category 2 and 3 UST systems, each facility must maintain an accurate diagram showing the location of:

- each UST and its associated piping, including registration identification number;
- dispensers or loading equipment;
- check valves;
- transition sumps (if any); and
- monitoring or recovery wells (if any).

For Category 3 UST systems, the diagram must also show:

1. The following tank system attributes:
   (i) physical dimensions of each tank; and
   (ii) installation date for each portion of piping that was installed after October 11, 2015.

2. At least one visible reference point (for example, facility structure), a frame of reference (for example, north arrow), and scale of the drawing.

For each component installed in a Category 3 tank system after October 11, 2015, facilities must also maintain:

1. a signed statement by the installer certifying that the tank system component was installed in compliance with the PBS regulations; and

2. the completed manufacturer's installation checklist showing that the tank system component was installed in accordance with the manufacturer's instructions or that the tank system component installation has been inspected and certified.

4.0 Petroleum Tank Registration

Regulated petroleum USTs must be registered with DEC, except in delegated counties (Nassau, Suffolk, Rockland, Westchester, and Cortland) where they must be registered with county agencies. Facility/property owners or their authorized representatives must obtain a registration certificate from DEC before any product may be delivered to a new or replaced tank.

Registrations must be renewed every five years. If ownership of the property where regulated tanks are located is transferred, an application for a new registration must be submitted to DEC within 30 days after the transfer of property. Registrations must be updated when new or replacement tanks are installed, when tanks are out-of-service or permanently closed, or when other registration information changes. Depending on a facility's total storage capacity, registration fees vary between $100-500. Delegated counties may have different fee structures.

See Chapter 19 for general CBS tank registration requirements.

4.1 Definition of Petroleum

As defined in the PBS regulations, petroleum includes:

- crude oil and any fraction thereof, including gasoline, diesel, fuel oil, etc.;
- synthetic forms of lubricating oils, dielectric oils, insulating oils, hydraulic oils, and cutting oils;
- any complex blend of hydrocarbons that is not derived from crude oil; and
- petroleum mixtures, including certain blends of petroleum and hazardous substances.

This definition does not include:

- hazardous substances except in certain blends with petroleum;
- animal or vegetable oils; or
- substances that are gases at standard temperature and pressure (e.g. propane).

Tank Registration
6 NYCRR 613-1.9

- All new or replaced regulated UST systems must be registered with DEC before they receive their first delivery.
- Petroleum tank registrations must be renewed every 5 years.
- The current registration certificate must be on display at all times at the facility.

4.2 Regulated Facilities

A facility must be registered if it has a total petroleum storage capacity greater than 1,100 gallons, or has AT LEAST one UST with capacity greater than 110 gallons (with some conditions and exceptions). Tanks storing used oil, regardless of size, must also be registered. The PBS Registration Fee Worksheet below can be used to determine whether the tanks at your facility need to be registered with DEC. A copy is available from the DEC website http://www.dec.ny.gov/chemical/4767.html

Check the DEC website for updated forms.

PBS Registration Fee Worksheet

The New York State Environmental Conservation Law was amended on July 21, 2008. Applicability, fees, and the definition of petroleum have changed. You may need to register some tanks that were not registered in the past and possibly pay different fees accordingly. A list of regulated petroleum products and the new definition of petroleum are available at http://www.dec.ny.gov/chemical/93458.html.

Please note: Manifold (interconnected) tanks are regulated as single tanks. For example, two 1,000 gallon tanks connected by piping are regulated as a single 2,000 gallon tank.

A) List the total storage capacity of all tanks storing petroleum. A) _____

B) List the total storage capacity of tanks less than 1,100 gallons, each storing heating oil (see link to product list above), used for on-premises consumption. B) _____

C) For farms or residences only, list the total storage capacity of tanks less than 1,101 gallons, each used to store motor fuel (see link to product list above) for non-commercial purposes (not for resale). C) _____

D) Subtract Lines B & C from A. A-B-C = D) _____

E) List how many Line D tanks are greater than 110 gallons and are underground (tank location code "3"). E) _____

F) List how many Line D tanks are greater than 110 gallons and are aboveground with 10% or more volume below ground (tank location "4"). F) _____

G) Add Lines E and F. E + F = G) _____

If Line D is 1,101 gallons or greater, then all tanks at this site MUST be registered and fees must be based upon the total storage capacity in Line A using the fee schedule below.

If Line D is less than 1,101 gallons but greater than 0 (zero) gallons and Line G is greater than 0 (zero), then all tanks MUST be registered and the fee must be based upon the total storage capacity in Line A using the fee schedule below.

If Line D is less than 1,101 gallons, and line G = 0 (zero), tanks storing used oil or used oil (heating), if any, MUST be registered but NO fee is required. Any other tanks storing petroleum do not require registration.

FEE SCHEDULE:

Total Storage Capacity	5-Year Fee for Facility
0 - 1,100 gallons	$0 - Fee not required.
1,101 - 2,000 gallons	$100 per storage facility
2,001 - 4,999 gallons	$300 per storage facility
5,000 - 399,999 gallons	$500 per storage facility
400,000 gallons and greater	Registration not required but license is required under the Major Oil Storage Facilities Program.

Revised 03/23/2015

Figure 4.1: PBS Fee Worksheet (Check DEC website for updated forms)

4.3 Facility Owner

The facility owner is the person who owns the property on which the regulated tanks are located. The facility owner is responsible for registering the tanks, even if someone else owns the tanks. However, the facility owner can designate an authorized representative (e.g. the tank owner) to submit the registration. If you wish to be an authorized representative, you should have the facility owner sign a written authorization. Be prepared to provide a copy to DEC if requested.

4.4 Notification of Tank Installation at a New Facility

You must notify DEC of tank installations at a new facility at least 30 days prior to installing any tanks. A Pre-Work Notification Form is available online at

http://www.dec.ny.gov/docs/remediation_hudson_pdf/tankmodnotice.pdf.

After the tanks are installed, and before having any product delivered to the tanks, you must obtain a registration certificate for the facility. See Section 4.9 for registration of additional or replacement tanks.

4.5 Registration of New Facilities

A new facility must be registered before product is delivered to the tanks. The applicant must use forms provided by DEC. The PBS Registration Application and instructions are available at all DEC offices and online at

http://www.dec.ny.gov/chemical/4767.html

Instructions are available at

http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinstr.pdf

Forms are often revised, so you should download the most recent form instead of using old copies.

A new registration must be accompanied by a copy of the deed page showing the owner name and date of ownership for the property where the facility is located. If the facility is located on multiple properties, then the deed page(s) for each property must be submitted. The deed page(s) provide confirmation of the property's legal ownership.

The facility owner or an authorized representative for the facility owner must sign the registration application. In addition, every application must be accompanied by payment of the

The facility owner is responsible for registering the tanks, even if the tanks are owned by someone else.

However, the facility owner can designate an authorized representative (e.g. the tank owner) to submit the registration.

You must notify DEC of tank installations at a new facility at least 30 days prior to installing any tanks.

registration fee as determined in the regulations. The application must list the actual names (not titles) of the Class A and B Operators and their operator authorization number.

4.6 Registration Certificate

Once your completed application and registration fee is submitted, DEC will issue a registration certificate. The current registration certificate must be displayed at all times in a conspicuous location at your facility. Make sure your Class C Operators know where the certificate is posted. DEC will also maintain a copy of the information you have submitted about your facility in a form called the Facility Information Record (FIR). If you need a copy of that information, you can request a copy of your FIR from DEC.

4.7 Renewal

Registration MUST be renewed every five years from the date of the last valid registration certificate. Registrations must be renewed until all regulated tanks at the facility are permanently closed. You may receive a courtesy reminder from DEC, along with pre-printed forms, when registration is due; however, you are responsible for submitting a renewal application whether or not you receive such a reminder. If there have been any changes at your facility, you may cross out the old information on the form and write in the new information.

4.8 Transfer

If ownership of the property where a facility is located is transferred, the new property owner or authorized representative must submit a new registration application to register the facility within 30 days after the transfer. The application must be accompanied by a copy of the current deed page(s) for the facility property (or properties) showing the new owner. The registration fee will be the same as for a new facility.

4.9 Registration of Additional or Replacement Tanks

Additional or replacement tanks must be registered when they are installed at a regulated facility. This includes brand-new tanks as well as tanks that are moved from one location of the property to be used at another location on the property.

Advance notification of the installation of a tank must be given to DEC at least 30 days prior to installing the tank, using the Pre-Work Notification Form.

Once a new or replaced tank is installed, you must submit an updated registration application. You will use the same form as for a new facility, but check "Tank Installation" in the "Transaction" box and enter the information for only the new tank on the second page of the

Registration MUST be renewed every five years from the date of the last valid registration certification.

Corrections of information at a facility must be submitted to DEC.

form. If adding a new tank results in an increased fee, the increased fee will not apply until the next renewal date. DEC will issue a new registration certificate that must be posted at your facility in place of the old certificate.

4.10 Information Correction

Corrections of facility information must be submitted to DEC. This includes changes in contact information, Class A or Class B Operator, tank system equipment, or type of petroleum stored.

You may submit:

- a copy of your most recent application with old information crossed out and new information written in, being sure to make these corrections neat and legible; OR
- a new copy of the application with the corrected information entered.

If there has been a change in tank equipment, you do not need to enter information for tanks that were not modified. However, you should enter complete information for tanks whose equipment has changed. For other information (e.g. changes in contact information), you should circle or highlight the information that has changed.

When a facility intends to permanently close a new tank, the owner must notify DEC at least 30 days prior to beginning the permanent closure process.

4.11 Tank Closure

The facility registration must be updated when a tank is out-of-service, following the procedure in section 4.10. The owner must notify DEC at least 30 days prior to beginning a permanent tank closure process. No later than 90 days after a tank has been permanently closed, the owner must submit a registration application indicating that the tank has been permanently closed. The owner is responsible for conducting a site assessment if one is required and submitting a closure report to DEC (see Chapter 6 for more information on closure requirements and practices).

4.12 Summary:

- All regulated tanks MUST be registered BEFORE any product is delivered to the tank and within 30 days after a transfer of ownership.
- Use the PBS Fee Worksheet to determine if your tanks need to be registered.
- The current registration certificate must be on display at the facility at all times.
- Tank registrations MUST be renewed every 5 years.
- See Chapter 19 for registration requirements for CBS tanks.

5.0 Financial Responsibility

Figure 5.5.1: Gasoline spill

As a tank owner or operator you are required to clean up any spill or release from your UST system.

Corrective actions are required for all spills, from small surface releases to major impacts to soil and groundwater. Such actions could include cleaning up leaked petroleum, correcting environmental damage, supplying drinking water, and compensating injured parties for property damage. In some cases clean-up costs can reach hundreds of thousands of dollars.

State statute (Navigation Law, Article 12) and federal regulations (40 CFR 280) hold the tank owner, the tank operator, AND the facility owner liable for these costs. You may also be financially responsible for any third-party bodily injury claims caused by an accidental release from your UST system.

5.1 Meeting the Financial Responsibility Requirement

Private tank owners/operators have several different mechanisms available to demonstrate financial responsibility. Local governments - such as cities, counties and towns - may also use any of these mechanisms in addition to those available only to local governments. Once you have chosen a mechanism for meeting financial responsibility requirements, you must have a document that demonstrates your compliance with the requirement. The format and type of documents vary. The federal regulations contain information that is required for particular mechanisms. Be sure that your documents are complete, up-to-date, and meet the requirements.

Financial Responsibility

40 CFR 280, Part H

- The tank owner, operator, and facility owner are each potentially responsible for cleanup costs, including third-party bodily injury claims, caused by an accidental release from a UST system.
- Tank owners or operators must maintain documentation of financial responsibility.

Oil Spill Fund

DEC may use money from the New York State Environmental Protection and Spill Compensation Fund - (also known as the Oil Spill Fund) to undertake corrective actions if an owner or operator is unable or unwilling to undertake a spill clean-up. HOWEVER, the Oil Spill Fund does not cover third-party bodily injury. In addition, the State is obligated by law to recover these funds, plus penalties and interest, from the owner or operator.

You should have financial assurance to cover liabilities including, but not limited to: clean-up; third property damage; third-party bodily injury and legal costs. You must have financial assurance to cover third-party bodily injury in the amounts described below.

Required Amounts of Financial Responsibility

It is important for you to understand the level of financial responsibility that applies to your site. Your method of coverage for every UST at your site must include at least the minimum required amount per occurrence as well as the minimum aggregate amount. The number of tanks may be based on multiple facilities under the same ownership.

Minimum financial responsibility, per occurrence:

For petroleum marketing facilities, or for any facility that handles an average of more than 10,000 gallons per month based on the previous calendar year's throughput	$1,000,000 per occurrence
For all other facilities	$ 500,000 per occurrence

Minimum aggregate financial responsibility:

For owners with 1 - 100 UST systems	$1,000,000
For owners with 101 or more UST systems	$2,000,000

These amounts of assurance do not include legal costs and do not limit tank owner/operator liabilities.

Acceptable Methods to Demonstrate Financial Responsibility

There are various ways to demonstrate financial responsibility. These methods are detailed in 40 CFR 280 Subpart H and can be combined to meet the requirements. The regulations list specific language that must be included in financial assurance documents. Your responsibility as a Class A Operator is to ensure the proper documentation is available and up-to-date.

You should have financial assurance to cover liabilities including, but not limited to: clean-up, third party property damage and legal costs.

You must have financial assurance to cover third-party bodily injury.

The following mechanisms can be used to provide financial responsibility for private and local government tank owners/operators (for specific requirements, refer to 40 CFR 280.95 - 103):

- Liability insurance coverage from a qualified provider
- Financial test of self-insurance
- Guarantee
- Surety bond
- Letter of credit
- Trust fund

The following mechanisms can be used in addition to the previously listed mechanisms to provide financial responsibility for local government tank owners/operators:

- Local government bond rating test
- Local government financial test
- Local government guarantee
- Local government fund

The tank owner/operator may substitute any compliant financial responsibility mechanism at any time provided that an effective mechanism or combination of mechanisms is maintained at all times.

Note: Guarantees and surety bonds are currently not allowed pending a statement from the State Attorney General that they are legally valid and enforceable obligations in New York State.

Insurance

Insurance coverage is a common mechanism to meet the requirement of financial responsibility. It is important to note the expiration date of the insurance policy and to promptly renew the policy to avoid any lapse in coverage. Be certain that your insurance company provides you with a renewed insurance certificate prior to the expiration of the previous certificate. A valid certificate is required to demonstrate that you meet the requirements of financial responsibility.

5.2 Reporting and Recordkeeping

The tank owner/operator must maintain documentation of financial responsibility. The type of document needed is based on the mechanisms used to meet the requirement. The accepted documents and evidence are described in the 40 CFR 280, Subpart H. You should contact the person responsible for meeting the financial responsibility requirements for your facility to ensure that the proper documents are available either at the facility or at the owner/operator's place of work. These documents must be made available to DEC upon request.

The tank owner or operator must maintain records of financial responsibility.

Documentation of your facility's financial responsibility mechanisms must be maintained until the UST system has been permanently closed.

It is the owner/operator's responsibility to be familiar with the details of the financial responsibility requirements. In the event of an accidental release at your site, it is important for an owner/operator to have the resources necessary to promptly perform the proper corrective actions.

It is the owner **or operator's** responsibility to be familiar with the details of the financial responsibility requirements.

5.3 Summary

As a Class A Operator, you should:

- Understand that you, the tank owner, and/or the facility owner are potentially financially responsible for accidental releases from your USTs.
- Understand that the Spill Fund is not an insurance program and that DEC is obligated to recover costs for cleanups it conducts.
- Understand that there must be financial responsibility (e.g., private insurance) in place to pay for damages due to accidental releases from your USTs.
- Know what kind of financial responsibility mechanism is required and in place for your site.
- Know how to access those funds promptly if necessary.
- Have a clear understanding with the tank owner regarding who is financially responsible in case of a spill.
- Understand the limits and the effective dates of coverage.

6.0 Out-of-Service Tanks and Permanent Closure

Figure 6.1: Out-of-Service Gas Station

Tank systems that do not receive or dispense product for 30 days or more are considered out-of-service. Those that are out-of-service for over 12 months must be permanently closed. Suspending service or closing a tank system requires more than simply shutting off the electricity, locking up the facility, and walking away. If you take a tank system out-of-service, you are still responsible for all required corrosion protection, leak detection, inspections, reporting, and registration. Tank systems that you do not plan to use again should be permanently closed. Prior to permanent closure, you must investigate your site for leaks that may have gone undetected over the life of the tank system. You must then close the system in compliance with regulations. You must take specific steps if you intend to convert a petroleum tank system to store a non-petroleum product.

You are required to notify DEC thirty days before permanently closing a tank system or switching the tank system to storage of a non-petroleum product.

6.1 Out-of-Service Tank Systems

If you temporarily take a tank system out-of-service, you must do ALL of the following after dispensing and deliveries to/from the tank cease:

- Submit an updated tank registration application to DEC, preferred within 30 days, showing the change in tank status.

Out-of-Service UST Systems and Closure Requirements
6 NYCRR 613-2.6

- UST systems that are out-of-service for more than 12 months must be permanently closed
- DEC must be notified 30 days prior to permanent closure
- Closure records must be maintained for 3 years

- Continue to perform leak detection (including ten-day inventory reconciliation, if required) OR remove product from the tank so there is no more than 1 inch of residual liquid (product or water) remaining in the tank.
- Maintain all corrosion protection. Power must remain on for impressed current systems.
- Continue required inspections and recordkeeping.

If you plan to take your tank system out-of-service for more than three months you must continue the practices listed above, and ALSO do the following:

- Lock all fills and dispensers.
- Cap and secure all lines, manways and ancillary equipment.
- Leave the vent lines open.

USTs that are temporarily closed for more than 12 months must be properly permanently closed.

Out-of-service tanks must remain registered and continue to be maintained to prevent leaks.

6.2 Permanent Tank Closure

UST systems that are out-of-service for over 12 months must be permanently closed. In addition, any tank system that you do not plan to return to service should be permanently closed. You must notify DEC at least 30 days before beginning permanent closure, unless the closure is a result of corrective action required by DEC.

Figure 6.2: Tank Removal

To permanently close a tank system:

- Empty and clean the tank by removing all liquids and accumulated sludge
- Remove the tank from the ground or fill it with an inert solid material (such as sand or concrete slurry). If an inert solid material is used all voids within the tank must be filled.
- All piping, vent lines and ancillary equipment must be disconnected and removed.
- Ensure that all scheduled deliveries to the tank are terminated.

No tank may be re-installed or returned to service after closure unless the tank meets Category 3 standards.

Site Assessment

Before permanent closure or a change in service is completed, you must assess the site for the presence of a release. The site assessment must include measurements for the presence of a release of product. Typically these measurements are made by analyzing samples of soil, groundwater, and/or vapor from the site. You must assess the area where contamination, if any, is most likely to be present. In selecting sample types, sample locations, and measurement methods, you must consider the method of closure, petroleum stored, type of backfill, depth to groundwater, and other factors appropriate for identifying the presence of a release.

If a facility uses groundwater monitoring or vapor monitoring as a method of leak detection, AND there is no indication that a release has occurred prior to closure, the site assessment is not required. If subsurface vapors and/or contaminated soil/groundwater are found, corrective action must be taken. Records from the site assessment must be submitted to the DEC within 90 days after the tank system is permanently closed.

Before permanent closure or a change in service, you must assess the site for the presence of a release.

6.3 Change in Service

A change in service means switching your tank system to storage of a substance other than petroleum. Before a change in service, you must:

- Empty and clean the tank by removing all liquid and accumulated sludge. All cleaning must be done in accordance with one of the codes of practice listed in the regulations; AND
- Complete a site assessment that meets the same requirements as for permanently closed tank systems.

You should also verify that the UST system is compatible with the new product and meets applicable codes and regulatory requirements.

If you switch the tank system to storage of a different type of petroleum product, you do not have to complete a site assessment, but you must submit a registration update to DEC within 30 days after the change in service. You also need to verify that your tank system is compatible with the new product and meets applicable codes and regulatory requirements.

6.4 Tank Systems Improperly Taken Out-of-Service before 12/27/1986

Tank systems that were taken out-of-service before 12/27/1986 and were not properly permanently closed must be properly permanently closed. In addition, all tank systems must be registered so that DEC has a record of their existence and proper closure.

6.5 Closure Records

All closure records must be transmitted to DEC within 90 days following permanent closure. All closure records must be maintained for 3 years.

Copies of all closure records must be transmitted to DEC within 90 days following permanent closure.

6.6 Registration Update

A registration update must be submitted to DEC after any change in status: out-of-service, permanent closure, change in petroleum product stored, or change in service. Registration updates may be submitted using the same forms as a new registration (see Chapter 20.0 for web links to current forms).

6.7 Summary

- Tank systems that do not receive or dispense product for 30 days or more are considered out-of-service.
- Tank systems that are out-of-service for over 12 months must be permanently closed.
- If you temporarily close a tank, you are still responsible for all required corrosion protection, leak detection, inspections, reporting, and registration
- Prior to permanent closure, you must investigate your site for petroleum leaks that may have gone undetected over the life of the tank system. This investigation is known as a site assessment.
- You must provide the results of the site investigation to DEC no later than 90 days after the date the tank system was permanently closed.

Figure 6.3: Out-of-service tank systems must be maintained until permanent closure.

- Tank systems taken out-of-service before 12/27/1986 that were not properly permanently closed must be properly closed.
- Specific steps, including a site assessment, must be taken if you intend to convert a petroleum tank system to store a non-petroleum product.

7.0 Overfill Prevention

Operators and drivers share the responsibility of ensuring that overfills or spills do not happen during fuel deliveries. The best way to prevent overfills is to deliver the proper amount of product.

Before the delivery begins, the driver should determine how many gallons of product can safely be delivered to the tank. The delivery driver must only deliver enough product to fill the tank to its working capacity, which is typically 90 or 95% of the tank volume. The portion of the tank that is unfilled at the start of delivery is often referred to as the ullage. Many automatic tank gauging systems will indicate the amount that can be safely delivered as the 95% ullage of the tank.

Why not 100%? Because if your tank is 100% full before the tank truck compartment is empty, the driver will be left with a hose full of fuel and nowhere to drain it. Overfills occur when there is not enough room in your tank for the remaining product. Additionally, fuels can expand due to temperature changes, resulting in a release from a 100% full tank. Spills to the environment could result in potential contamination of soil or water, or could even start a fire.

Tanks must be equipped with automatic alarms or other approved devices to warn the driver or to stop the delivery before an overfill occurs.

Figure 7.1 shows a driver preparing to make a fuel delivery. The farthest pink hose carries vapors from the UST to the truck. The other carries regular gasoline from the truck to the UST. The green hose is double-walled. It delivers premium product through an inner hose and returns vapors to the truck via an interstitial space. "Elbow" fittings on the end of the green hose and closest pink hose create a liquid tight seal to the tank fill pipes.

Fire codes require delivery drivers to be standing near their vehicles and attentive during delivery, not sitting in their truck or in your building. Chapter 20 lists web links to organizations such as the National Fire Protection Association and the American Petroleum Institute that provide standards for fuel transfers.

Figure 7.1: Fuel Delivery

Overfill Prevention Requirements 6 NYCRR 613-2.1(b)(3)

- Must prevent spilling and overfill when petroleum is being transferred to the UST System
- Must prevent spills when transfer hose is detached from fill pipe

Operator's Responsibilities to Prevent Delivery Overfills

You should confirm that your fuel supplier has a written delivery procedure for their drivers. Alternatively, you may provide written procedures and require drivers to follow them.

In addition you MUST:

- Monitor all fuel deliveries from beginning (either operator or carrier) to end. Physically monitor your delivery drivers or focus a security camera on your fuel-delivery area.
- Inspect your spill buckets routinely for presence of product or water, as well as cracks, worn seals, etc. See Chapter 13 for more information.
- Respond to ALL overfill indications. Never ignore overfill alarms or fuel flow shut-off.
- Report and clean up all spills. Have spill clean-up materials handy during all fuel deliveries. Post emergency phone numbers in a prominent location for reportable spills. Report spills to the proper authorities. See Appendix A for a sample emergency phone number template.

Inspect spill buckets routinely

Shut-off valves must be maintained.

What Do Overfill Prevention Devices Do?

You are the primary overfill prevention device! You are responsible for seeing that your tanks are equipped with proper overfill prevention devices and that delivery personnel follow proper procedures. An overfill alarm will alert the delivery driver that the tank has reached the working capacity but, if ignored, will not prevent an overfill. Other overfill prevention devices either stop or limit the flow of product into the tank BEFORE the tank is filled to the very top, so that product left in the hose will still fit into the tank.

You are required to have an overfill prevention device that will perform one of these three functions:

- automatically shut off flow into the tank when the tank is no more than 95% full;
- alert the operator or driver when the tank is no more than 90% full by restricting flow into the tank or triggering a high-level alarm; or
- restrict flow 30 minutes prior to overfilling, or alert the operator or carrier with a high-level alarm one minute before overfilling.

Figure 7.2: Installing a flapper valve

The two most common overfill prevention devices used to perform the functions above are:

- electronic alarms;
- mechanical overfill devices (ball float valves, shut-off valves).

What is Exempt?

A facility is not required to use spill or overfill prevention devices on UST systems that are only filled by transfers of 25 gallons or less at a time.

7.1 Mechanical Overfill Device

Automatic Shut-off Valves

Automatic shut-off valves (also known as *flapper valves*) are installed in the tank's drop tube. The drop tube is a thin aluminum tube located inside the tank's fill pipe that extends to the bottom of the tank. A float-activated "flapper" slams shut and restricts flow to the tank when the liquid level in the tank reaches 95% of the fill tank volume. The delivery hose then "jumps", alerting the driver that the flapper has been closed. The driver should immediately stop the flow of fuel from the truck and drain any excess fuel from the hose into the tank. Drivers need to be watching the delivery hose in order to notice this "jump".

Shut-off valves work well as long as they are installed correctly and maintained properly. The most common issues with shut-off valves are:

Figure 7.3: View of a flapper valve from a spill bucket

Shut-off valves have moving parts that can break.

- Test your shut-off valve annually.

Shut-off valves must not be disabled or bypassed.

- Never leave a gauging stick or other item in your fill pipe. Such items can keep your shut-off valve from closing properly. Call your service technician to check your shut-off valve if you find an item stuck in your drop tube. Do not allow deliveries to a tank with the shut-off valve jammed open.

The sudden closing of the drop tube will put stress on the delivery system.

- The hose connections to the tank and the truck must be secure or they may disconnect, causing a surface spill.

The connection between the tank and the delivery hose MUST be liquid tight.

Deliveries must be made by gravity only.

Ball Float Valves (613-2.1(b)(3)(i)(b)(2))

A ball float valve is contained in a short piece of pipe that extends into the top of the tank where the vent pipe or Stage I vapor recovery exits the tank. You might find it extremely difficult to determine whether or not your UST has this device because it is not readily visible. Typically, a ball float valve consists of a wire cage containing a hollow ball. The cage is fastened to the lower end of the vent pipe. The ball sits below the end of the pipe inside the wire cage. As the product level in the tank rises, the ball floats up on the rising liquid. The ball will eventually block the vent opening if the level of the product gets too high. With the vent opening blocked, very little fuel can enter the tank. For a ball float to prevent an overfill, the tank must be air-tight and the delivery hose must be tightly clamped onto the fill pipe. The working capacity of a tank equipped with a ball float valve should be set at no more than 90% of the design capacity.

Figure 7.4: Ball Float Valve

Ball float valves are NOT user friendly. They increase the pressure in the tank, sometimes causing fuel to splash back onto the driver if he/she tries to disconnect the hose. Drivers often try to relieve the pressure by opening the drain in the spill bucket or the cap of the automatic tank gauge. These fittings are NOT DESIGNED to be opened during delivery. Doing so can release flammable vapors, which can cause an explosion.

The Petroleum Equipment Institute (PEI) recommends ball float valves NOT be used at all. See the PEI link in Chapter 20.0 for more information.

The following issues may lead to extremely hazardous conditions when using a ball float valve:

Deliveries should be made by gravity only.

- Ball float valves are not designed to be used with pressurized deliveries.

Fill connections must be tight.

- If the fill connection is not tight, fuel will back up in the fill pipe and result in a spill on the ground when the ball float valve closes.

Ball float valves should not be used for generators or heating oil tanks.

- These tanks often have loose connections or fill via pumped (pressurized) delivery.

Ball float valves may cause product to escape through remote fills and gauge openings.

Ball float valves are NOT user friendly

Ball float valves perform poorly in suction piping systems.

- When a ball float closes, the fuel in the tank pressurizes and looks for an escape route. Dispensers are the most common escape routes and an overfill can occur through a dispenser near your customers.

Coaxial Stage I vapor recovery systems render the ball float useless because the recovery port allows the tank to keep venting.

Note: It is illegal and unsafe for a tank to be equipped with both an automatic shut-off valve AND a ball float valve. Having both of these devices is NOT allowed. A ball float valve will interfere with the operation of the automatic shut-off valve if it activates before the shut-off valve closes.

Never ignore overfill alarms

7.2 Electronic Overfill Alarms

Electronic overfill alarms are the most versatile of the overfill prevention technologies. They can be used with tanks that have tight or loose-fill connections and receive either gravity or pumped (pressurized) deliveries.

Figure 7.5: Electronic overfill alarm

Most overfill alarms are tied to an automatic tank gauging (ATG) system by means of probes/sensors. One such probe is located inside the tank and has a float that rises as the tank is filled. Typically, an alarm is triggered when the tank is 90% full. The alarm can be seen or heard or both. An overfill alarm should be located outdoors near the fill area and be clearly labeled so the driver knows when the tank has reached its working capacity. When the alarm sounds, the valve at the truck must immediately be closed and the contents of the delivery hose drained into the tank.

When an overfill alarm activates often, DO NOT ignore it. A frequent overfill alarm may mean there is something wrong with the delivery procedure or your tank. The working capacity of the tank may be less than you think it is. Call your service provider to verify the overfill alarm settings are correct and match the working capacity of your tank.

Many overfill alarms are equipped with a test button. The alarm must be tested monthly to ensure the audible and visual alert mechanism is operating properly.

The most common issues with electronic overfill alarms are:

Automatic tank gauging systems must be programmed for the correct tank and tank chart to ensure the correct working capacity is used.

The system power must be on.

- If the power to the overfill alarm or the ATG is turned off the delivery driver will not be aware of an overfill. If the alarm is equipped with a test button, the delivery driver should test the alarm prior to delivering product to the tank.

Many sites have several tanks and one alarm.

- Once the alarm is activated, it will remain on while delivering to any additional tanks. The driver may then have no way of knowing when the next tank has reached its working capacity

8.0 Inventory Monitoring

Inventory monitoring helps you track how much product is going into your tank and how much is coming out. Tracking gallons "in" and gallons "out" versus how much is in the tank will help you detect missing product and possible leaks.

If your tanks store motor fuel or kerosene, and if any amount of that product will be sold as part of a commercial transaction, then you must perform 10-day inventory reconciliation. You must ALSO meet the leak detection requirements outlined in Chapters 9.0 and 10.0. If you have tanks that store other types of product, or product that is only used onsite, you may use 10-day inventory reconciliation as an extra leak detection measure.

Ten-day inventory reconciliation includes five important steps:

1. Take daily measurements of the product in the tank. This measurement is usually called the "stick reading" even if you use an electronic gauge instead of a stick. Also measure the total gallons of product dispensed from the tank (totalizer readings) and gallons of product delivered to the tank.

2. Calculate the daily difference ("variance") between the product level calculated from your totalizer and delivery receipts, and the product level you actually measure.

3. Calculate the sum of daily variances at least every 10 days.

4. Compare the sum of daily difference to allowable variances at least every 10 days.

5. React to variances and investigate possible leaks.

Inventory monitoring tracks all the changes to the amount of product in your system, from delivery to dispensing. It allows you to identify leaks from many different components of your UST system.

The reliability of inventory information is only as good as the care you take in your measurements and calculations.

Inventory monitoring 6 NYCRR 613-2.3(c)(1)

- If your tanks store motor fuel or kerosene, and if any amount of that product will be sold as part of a commercial transaction, you must track your tank's inventory to determine whether your tank is leaking
- Inventory reconciliation must be done every 10 days.
- The reliability of inventory information is only as good as the care you take in your measurements and calculations.

8.1 Daily Inventory Monitoring – What To Do Each Day

Each operating day you must record the volume/amount of:

- petroleum delivered;
- petroleum dispensed;
- petroleum remaining in tank; and
- water (if any) in tank.

Take separate inventory measurements for each UST at your facility. Collect the tank level readings and the daily sales data at the same time. These steps will ensure that no sales or deliveries are missed. You only have to record these measurements on days you receive or dispense product. At facilities where the site does not dispense or receive product for a day or more during a given 10-day period, you should stick the tank at the end of the last operating day before the shut-down period and at the beginning of the first day afterwards. Each intervening day should be crossed out on the reconciliation spreadsheet (not filled out with zeroes, which might be interpreted as measurements).

Measuring the Product Level with an Electronic Monitoring System

An automatic tank gauging (ATG) electronic monitoring system is designed to tell you what's going on in your tank system. Along with monitoring your tanks for leaks, the system may tell you the product level, volume, and temperature; water level and volume; and high and low level product warnings. A typical monitoring console is shown in Figure 8.1.

Figure 8.1: ATG system console (example of one make/model)

Your ATG monitoring system must be able to measure both product and water level in your tank. It must be accurate within 1/8" to be used for inventory monitoring. Make sure your ATG system has been calibrated for the tank at your site and has been programmed using your specific tank's tank chart. A good way to check to see if your ATG has been programmed correctly is to take the product height on your inventory report and find the volume of product (in gallons) using your tank chart. The volume you find from your tank chart should match the volume on your inventory report.

Some systems can be programmed to automatically perform 10-day inventory reconciliation, but this requires the system to interface with the dispenser. You can check with your service technician to see if your system can do automatic reconciliation.

Measuring the Product Level Using a Gauging Stick

You can manually measure the product level in your UST using a gauging stick. Gauging sticks are long wooden sticks with height measurements marked on them. For accurate measurements and to meet the requirements in the regulations your gauging stick must be:

- straight
- unbroken
- without wear or damage on the bottom
- marked in 1/8" increments
- marked with legible numbers.

Figure 8.2: Measuring tank level with gauging stick

To take a product level reading, lower the stick gently to the bottom of the tank. Be sure to keep the stick vertical and try not to touch the sides of the riser. Do NOT bounce the stick on the tank bottom. Remove the stick from the tank and locate the line where the stick is wet. Record the number in inches to the **nearest 1/8"**. Figure 8.2 shows proper technique for using a tank gauging stick.

Sites where tanks are not stuck to the nearest 1/8" can expect to have significant inventory variances, and the results will not meet regulatory requirements.

Gauging sticks must be clearly legible and in good condition. Do NOT use a gauging stick that is broken or rounded on the end. Your tank gauging stick may have a Teflon "button" at the bottom. If the button is missing your stick is not the correct length.

Using a stick that is not in good condition will cause serious problems with your inventory records. Figure 8.3 and Figure 8.4 show tank gauging sticks that should NOT be used for inventory monitoring.

Figure 8.3: Tank gauging stick with broken end (EPA)

Figure 8.5: Rounded tank gauging stick (EPA)

Make sure your gauging stick is not rounded or broken at the end.

Use a tank chart to convert the depth measurement into gallons. Make sure you have the correct tank chart for your tank. Tank charts are available through your tank manufacturer. If your tanks are not all the same size, be sure that you are using the correct tank chart for each tank. Your tank chart must include measurements in 1/8" increments. Record the number of gallons in your inventory reconciliation report.

Dipstick Calibration Chart for 3,000 Gallon - 6' Diameter **DWT-II** Tank

DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS
0-1/8"	6	7-1/4"	164	14-3/8"	430	21-1/2"	763	28-5/8"	1135
0-1/4"	8	7-3/8"	168	14-1/2"	435	21-5/8"	769	28-3/4"	1141
0-3/8"	9	7-1/2"	172	14-5/8"	441	21-3/4"	775	28-7/8"	1148
0-1/2"	11	7-5/8"	176	14-3/4"	446	21-7/8"	781	29"	1155
0-5/8"	12	7-3/4"	180	14-7/8"	452	22"	788	29-1/8"	1162
0-3/4"	14	7-7/8"	184	15"	457	22-1/8"	794	29-1/4"	1168
0-7/8"	15	8"	188	15-1/8"	462	22-1/4"	800	29-3/8"	1175
1"	17	8-1/8"	192	15-1/4"	468	22-3/8"	807	29-1/2"	1182
1-1/8"	19	8-1/4"	196	15-3/8"	473	22-1/2"	813	29-5/8"	1189
1-1/4"	21	8-3/8"	200	15-1/2"	479	22-5/8"	819	29-3/4"	1196
1-3/8"	23	8-1/2"	204	15-5/8"	484	22-3/4"	826	29-7/8"	1202
1-1/2"	24	8-5/8"	208	15-3/4"	490	22-7/8"	832	30"	1209
1-5/8"	26	8-3/4"	213	15-7/8"	496	23"	838	30-1/8"	1216
1-3/4"	29	8-7/8"	217	16"	501	23-1/8"	845	30-1/4"	1223
1-7/8"	31	9"	221	16-1/8"	507	23-1/4"	851	30-3/8"	1230
2"	33	9-1/8"	226	16-1/4"	512	23-3/8"	858	30-1/2"	1236
2-1/8"	35	9-1/4"	230	16-3/8"	518	23-1/2"	864	30-5/8"	1243
2-1/4"	37	9-3/8"	234	16-1/2"	524	23-5/8"	870	30-3/4"	1250
2-3/8"	40	9-1/2"	239	16-5/8"	529	23-3/4"	877	30-7/8"	1257
2-1/2"	42	9-5/8"	243	16-3/4"	535	23-7/8"	883	31"	1264
2-5/8"	45	9-3/4"	248	16-7/8"	541	24"	890	31-1/8"	1270
2-3/4"	47	9-7/8"	252	17"	546	24-1/8"	896	31-1/4"	1277
2-7/8"	50	10"	257	17-1/8"	552	24-1/4"	903	31-3/8"	1284
3"	52	10-1/8"	261	17-1/4"	558	24-3/8"	909	31-1/2"	1291

Figure 8.4: SAMPLE tank chart. Each tank will have its own chart. You must use the correct chart for your tank.

DAY	DATE	START STICK INVENTORY (GALLONS)	GALLONS DELIVERED (GALLONS)	GALLONS PUMPED (GALLONS)	BOOK INVENTORY [A] (GALLONS)	END STICK INVENTORY (INCHES)	END STICK INVENTORY [B] (GALLONS)	DAILY OVER (+) or SHORT (-) (END - BOOK) [B] - [A]	WATER (INCHES)
1		(+)	(-)	(=)					
2		(+)	(-)	(=)					
3		(+)	(-)	(=)					
4		(+)	(-)	(=)					
5		(+)	(-)	(=)					
6		(+)	(-)	(=)					
7		(+)	(-)	(=)					
8		(+)	(-)	(=)					
9		(+)	(-)	(=)					
10		(+)	(-)	(=)					

Figure 8.6: Excerpt from DEC 10-day inventory reconciliation worksheet

Make sure the water finding paste you are using is compatible with your product

Daily tank inventory levels must be recorded on your 10-day inventory reconciliation worksheet. Figure 8.6 *highlights the column where you should enter your tank level at the beginning of the day ("Start stick inventory"). A sample 10-day inventory reconciliation worksheet and instructions is available in Appendix B.*

Measuring Water in the Tank

The best way to manually measure water in your tank is by using water-finding paste (also known as water paste) on your gauging stick. Most gasoline today contains ethanol, so be sure to use a paste that is compatible with ethanol-blend gasoline. If you have a different product at your site make sure you use a water finding paste that is compatible with your product. Follow the paste manufacturer's instructions, paying particular attention to how long the paste needs to stay in the tank and to what color the paste will change (Figure 8.7).

Record the height of water, to the nearest 1/8", on your inventory reconciliation report.

Electronic monitoring systems may have a water sensor to detect water in tanks. Confirm that the water sensor is installed and working properly before you rely on your ATG to detect water in your tanks. Be sure to confirm that the water sensor is compatible with the product you are storing.

Figure 8.7: Tank gauging stick with water-finding paste. This brand turns red to indicated water level in the tank . Other brands of paste may use different colors.

DAY	DATE	START STICK INVENTORY (GALLONS)	GALLONS DELIVERED (GALLONS)	GALLONS PUMPED (GALLONS)	BOOK INVENTORY [A] (GALLONS)	END STICK INVENTORY (INCHES)	END STICK INVENTORY [B] (GALLONS)	DAILY OVER (+) or SHORT (-) (END - BOOK) [B] - [A]	WATER (INCHES)
1		(+)	(-)	(=)					
2		(+)	(-)	(=)					
3		(+)	(-)	(=)					
4		(+)	(-)	(=)					
5		(+)	(-)	(=)					
6		(+)	(-)	(=)					
7		(+)	(-)	(=)					
8		(+)	(-)	(=)					
9		(+)	(-)	(=)					
10		(+)	(-)	(=)					

Figure 8.8: Excerpt from DEC 10-day inventory reconciliation worksheet

Daily water levels should be recorded on your 10-day inventory reconciliation worksheet. Figure 8.8 *highlights the column in which to record this information.*

Measuring Dispensed Product

The gallons of product pumped can be read on the totalizer meters located on your dispensers. Totalizers look and work a lot like an automobile odometer. They record the total gallons of product that flow through your dispenser. Subtract the previous totalizer reading from the current totalizer reading to get the number of gallons pumped since the last reading.

DAY	DATE	START STICK INVENTORY (GALLONS)	GALLONS DELIVERED (GALLONS)	GALLONS PUMPED (GALLONS)	BOOK INVENTORY [A] (GALLONS)	END STICK INVENTORY (INCHES)	END STICK INVENTORY [B] (GALLONS)	DAILY OVER (+) or SHORT (-) (END - BOOK) [B] - [A]	WATER (INCHES)
1		(+)	(-)	(=					
2		(+)	(-)	(=					
3		(+)	(-)	(=					
4		(+)	(-)	(=					
5		(+)	(-)	(=					
6		(+)	(-)	(=					
7		(+)	(-)	(=					
8		(+)	(-)	(=					
9		(+)	(-)	(=					
10		(+)	(-)	(=					

Figure 8.9: Excerpt from DEC 10-day inventory reconciliation worksheet

Volume of dispensed product should be recorded on your 10-day inventory reconciliation worksheet. This is NOT equal to the totalizer reading; this is the difference between the current totalizer reading and the previous totalizer reading. Figure 8.9 *highlights the column in which to record this information.*

The number of gallons dispensed must be metered and recorded within an accuracy of 6 cubic inches for every 5 gallons of product withdrawn

You may also be able to find the number of gallons of each grade of product pumped from the sales volume in your point of sale system, console or product management system.

Whether you find the number of gallons pumped from your totalizer or from your point of sale system your meters need to be properly calibrated. The number of gallons dispensed must be metered and recorded within an accuracy of 6 cubic inches for every 5 gallons of product withdrawn.

Recording the Amount of Product Delivered

You can find the amount of product delivered by looking at your bill or delivery receipt. The delivery receipt should indicate both a net and a gross delivery volume. Use the gross volume as the number of gallons delivered for inventory monitoring calculations. The net volume is corrected for temperature and should not be used for inventory monitoring. For accurate delivery volumes, product must be delivered in a drop tube that extends within 1 foot of the tank bottom.

DAY	DATE	START STICK INVENTORY (GALLONS)	GALLONS DELIVERED (GALLONS)	GALLONS PUMPED (GALLONS)	BOOK INVENTORY [A] (GALLONS)	END STICK INVENTORY (INCHES)	END STICK INVENTORY [B] (GALLONS)	DAILY OVER (+) or SHORT (-) (END - BOOK) [B] - [A]	WATER (INCHES)
1			(+) (-)	(=)					
2			(+) (-)	(=)					
3			(+) (-)	(=)					
4			(+) (-)	(=)					
5			(+) (-)	(=)					
6			(+) (-)	(=)					
7			(+) (-)	(=)					
8			(+) (-)	(=)					
9			(+) (-)	(=)					
10			(+) (-)	(=)					

Figure 8.10: Excerpt from DEC 10-day inventory reconciliation worksheet

Volume of product delivered should be recorded on your 10-day inventory reconciliation worksheet, Figure 8.10 *highlights the column in which to record this information*

Completing the Math

To complete the required calculations, see the instructions for the Sample Inventory Report in Figure 8.11 (blank form is provided in Appendix B). You can make your job much easier and reduce math errors by creating a spreadsheet on your computer to complete the calculations for you. Some electronic monitoring systems may be even be programmed to perform these calculations automatically.

Use the gross volume as the number of gallons delivered for inventory monitoring calculations.

The net volume is corrected for temperature and should NOT be used for inventory monitoring.

Your daily variance will rarely, if ever, be zero because the measurements you are taking are not exact. HOWEVER, your daily variance shouldn't be too large. If you have a large daily variance and it is not a math error, PAY ATTENTION - your facility may have a leak.

If your total variance is larger than your allowable variance and can't be explained within 48 hours by a math error, or some other reason that isn't related to leakage, then you must notify DEC.

What To Do If You Have A Blended Mid-Grade Product

Some dispensers blend low- and high-grade product to make a mid-grade product. You must record sales of these products correctly on your daily inventory. You can use the blend ratio to determine how much of each product is dispensed for each gallon of mid-grade product. For example, a site that combines 87 octane and 93 octane to dispense 89 octane would have a blend ratio of 60% (87 octane) product and 40% of 93 octane. In other words, for every 100 gallons of mid-grade sold, there are 60 gallons of 87 octane and 40 gallons of 93 octane. Be sure you are using the correct blend ratio for your site based on the octane ratings of each product. Using the wrong blend ratio can give incorrect inventory results.

Be sure that you are using the correct blend ratio if your dispensers blend fuels.

What To Do If You Have Siphoned/Manifolded Tanks

Some facilities have tanks with a siphon between the tanks, or have tanks that with manifolded fill pipes (see Chapter 3 for more information). The stick readings for each tank should be taken at the same time, but recorded separately. Often, the stick readings will be within an inch or two of each other. If your tanks have different sizes, be sure to use the correct stick reading for each tank or it could affect your inventory results. When two tanks are siphoned or manifolded together, the inventory, sales and deliveries will be combined.

8.2 What To Do At Least Every 10 Days

Check the Total vs. the Allowable Variance

At the end of each 10-day inventory reconciliation period you must compare your total gallons delivered, total gallons pumped, and total tank volume to see which of these values is the largest. The allowable variance is 0.75% of the largest of those three values. Your total variance must be less than the allowable variance; otherwise, you will have to explain the exceedence. See the Sample Inventory Report for detailed instructions on how to determine your total variance.

Check your total variance after completing your 10-day inventory reconciliation. Your variance may indicate a leak.

Sample Inventory Report

The red numbers in the list below reference the red numbers in Figure 8.11

1. Start Stick Inventory: This is the actual amount of product (End Stick Inventory) from the previous day, measured by your electronic monitoring system or by a gauging stick. On Day 1, this number is the End Stick Inventory from Day 10 of the previous ten days.
2. Gallons Delivered: Record the total volume delivered for each day that product is delivered to the tank.
3. Gallons Pumped: Record net totalizer readings or look them up on your point-of-sale system. No product should be pumped between making End Stick Inventory readings and Gallons Pumped readings.
4. Book Inventory: Add "Gallons Delivered" to "Start Stick Inventory", then subtract "Gallons Pumped". (Start Stick Inventory + Gallons Delivered – Gallons Pumped).
5. End Stick Inventory: Record the actual amount of product present at closing time as measured by your ATG or gauging stick.
6. Daily Over/Short: Subtract your Book Inventory from your measured End Stick Delivery. (End Stick Inventory – Book Inventory).
7. Water: Record the depth of any water at the bottom of the tank. It must be recorded each day even if it is zero.
8. Total Gallons Delivered: Add up all the deliveries in the "Gallons Delivered" column.
9. Total Gallons Pumped: Add up all the product pumped in the "Gallons Pumped" column.
10. Total Tank Volume: The total volume of your tank. This should be listed on your tank chart. The actual volume will likely be a little more or less than the volume on the chart.
11. Total Gallons Over/Short (Total Variance): Sum the daily over/short values. Be sure you add "over" amounts and subtract "short" amounts. If the amount is negative, do not enter the minus sign. You will use only the absolute value (ignoring the sign) of this number in step 14.
12. Compare your Total Gallons Delivered, Total Gallons Pumped and Total Tank Volume. Choose the largest number.
13. Multiply the largest number from Step 12 by 0.0075. This is your Allowable Variance.
14. Compare the Allowable Variance to the Total Gallons Over/Short. If the Total Gallons Over/Short is larger than the Allowable Variance then you must investigate the possible leak. If the Total Variance is greater than the Allowable Variance AND cannot be explained, or if there is recurring water in your tank, you must notify DEC.

10-DAY INVENTORY RECONCILIATION WORKSHEET FOR METERED USTs

Facility Name: Big Apple Oil
Address: 100 59th Street
New York, NY

PBS Number: 555555
Tank ID No: 5000
Product Stored: Gasoline

Inventory record for period from 02 / 01 / 2014 to 02 / 10 / 2014

DAY	DATE	START STICK INVENTORY 1 (GALLONS)		GALLONS DELIVERED 2 (GALLONS)		GALLONS PUMPED 3 (GALLONS)		BOOK INVENTORY [A] 4 (GALLONS)	END STICK INVENTORY 5 (INCHES)	[B] (GALLONS)	DAILY OVER (+) or SHORT (-) (END - BOOK) 6 [B] - [A]	WATER 7 (INCHES)
1	02/01	1428	(+)		(-)	156	(=)	1272	31-5/8"	1265	-7	1/4"
2	02/02	1265	(+)		(-)	75	(=)	1190	30-3/8"	1197	7	1/4"
3	02/03	1197	(+)	1000	(-)	102	(=)	2095	47"	2094	-1	1/4"
4	02/04	2094	(+)		(-)	130	(=)	1962	44-1/2"	1965	3	1/4"
5	02/05	1965	(+)		(-)	56	(=)	1909	43-1/2"	1912	3	1/4"
6	02/06	1912	(+)		(-)	83	(=)	1829	41-7/8"	1825	-4	1/4"
7	02/07	1825	(+)		(-)	42	(=)	1783	41-1/8"	1785	2	1/4"
8	02/08	1785	(+)		(-)	73	(=)	1712	39-3/4"	1711	-1	1/4"
9	02/09	1711	(+)		(-)	123	(=)	1588	37-5/8"	1595	8	1/4"
10	02/10	1595	(+)	1000	(-)	258	(=)	2337	51-7/8"	2332	-5	1/4"

TOTAL GALLONS DELIVERED → 2000 (8) | 935 (9) ← TOTAL GALLONS PUMPED

TOTAL TANK VOLUME → 2910 (10)

TOTAL GALLONS OVER / SHORT → 5 (11) (DROP SIGN)

At the end of the 10-day period, determine which of the above totals is the LARGEST (TOTAL GALLONS DELIVERED, TOTAL GALLONS PUMPED or TOTAL TANK VOLUME) and enter the number into the box below to calculate the ALLOWABLE VARIANCE.

COMPARE THESE TWO NUMBERS (14)

(12) 2910 × 0.0075 = 21.825 (13) → ALLOWABLE VARIANCE

☞ Is the TOTAL GALLONS OVER/SHORT **LARGER** than the ALLOWABLE VARIANCE? (*circle one*) YES (*see below**) NO

☞ Is there an INCREASE/FLUCTUATION/RECCURENCE of water in the bottom of the tank? (*circle one*) YES (*see below**) NO

* If you answered YES above, if the TOTAL GALLONS OVER/SHORT is **LARGER** than the ALLOWABLE VARIANCE, or if there was an INCREASE/FLUCTUATION/RECCURENCE of water in the bottom of the tank – in accordance with 6 NYCRR Part 613.4(d), the operator MUST initiate an investigation into possible causes. If **WITHIN 48 HOURS** the cause CANNOT be explained by inaccurate recordkeeping, temperature variations, or other factors not related to leakage, the operator MUST notify the owner and the New York State Department of Environmental Conservation (**SPILL HOTLINE: 1-800-457-7362**). The tank MUST be taken temporarily out-of-service in accordance with Part 613.9(a) UNTIL such time that inspections and/or tightness tests are performed, the cause is determined and necessary repairs or replacements are made.

EXPLANATION OF EXCEEDANCE OF ALLOWABLE VARIANCE

Cause determined to be: _____

Describe required action taken (i.e., inspection/repairs/tests, etc.) on ___/___/___ (*date*): _____

Figure 8.11: Sample 10-day inventory reconciliation worksheet

DO NOT IGNORE VARIANCES!

Check for Recurring Accumulation of Water

If your water levels are increasing you may have a leak. Small amounts of water can enter your tank during deliveries or tank maintenance but if you have a steady increase in the amount of water in your tank you need to investigate for a possible leak.

Troubleshooting Variance Measurements

If you are calculating high variance amounts, you may be inaccurately measuring or completing the calculations. Try the following troubleshooting suggestions:

- Check the tank chart: Are you using the correct tank chart for your tank? Are you mis-reading the tank chart?
- Tank gauging stick: Your tank gauging stick must accurately measure product height to the nearest 1/8". In addition, the numbers on your stick should be legible and the stick should not be broken or rounded at the end. The Teflon "button" at the bottom of the stick should be intact.
- **Stick reading recorded to nearest 1/8"**: Are you recording your tank readings to the nearest 1/8"?
- Siphoned/manifolded tanks: Make sure your siphoned or manifolded tank inventories are recorded correctly. If a siphoned system has two different tank sizes, be sure that the correct stick reading is used for each tank.
- Tank gauge calibration: If you are using an electronic monitoring system, you need to check to make sure your tank gauges are calibrated correctly.
- Dispenser meters (totalizers): Check that your dispenser totalizers are calibrated and are working correctly.
- Math errors: Check for math errors. If you are using a spreadsheet, check the formulas in your cells to make sure they haven't been accidentally changed.
- Proper totalizers are used for each product: If your pumps dispense multiple products make sure you are reading the gallons dispensed off the proper totalizer.
- Confirm blend ratios: Confirm the amount of high-grade and low-grade product you are blending to create your blended mid-grade gasoline.
- Confirm electronic monitoring system matches tank chart: Electronic monitoring systems should be calibrated according to your tank chart. Be sure the correct tank chart was used and that your electronic monitoring system was calibrated correctly.

Check for math errors that may have occurred if you have a high inventory variance

- Temperature variations: Product can expand and contract in different temperatures. If you have a 10-day period where the air temperatures have varied greatly, it may be affecting your variance measurements.
- Tank tilt: If possible, determine whether the tank is tilted. A tank measurement on a tilted tank could create a variance.
- Multiple tanks: Confirm that the correct stick readings and tank charts are used for each tank.
- Compare product variances to determine if a loss in one product is resulting in a gain of product in a different product. This could indicate that: the wrong sales data was used, a cross drop may have occurred, or the product blending ratio is not correct.
- Cross Drops: The delivery driver may deliver product to the wrong tank. It is important to take stick reading before and after each delivery. This will confirm that the correct amount of product was delivered to the correct tank. If the driver overfills a tank, it is possible for the product to travel through a vent manifold to a different tank. The delivery driver should stop delivery when the overfill prevention method is triggered.

If your variance is too high but the discrepancy can be explained, you must add your explanation to the inventory reconciliation worksheet. There is a space at the bottom of the worksheet for you to record your explanation.

Discrepancies that may be explained include:

- Inaccurate recordkeeping
- Temperature variations
- Other factors not related to leakage
- Taking the tank out-of-service

The inventory at your site should be consistent.

If your site has major variances, investigate the cause.

Do not expect a bounce back correction to occur.

8.3 Leak Reporting

You must report any leaks or suspected leaks to DEC. If you have any unexplained discrepancies in your inventory report, this is considered a possible/suspected leak and must be reported. You must notify DEC within 48 hours if the discrepancies cannot be explained.

Suspected leaks must be reported within 48 hours

Report evidence of a possible leak to the DEC spill hotline: 1-800-457-7362 (or 1-518-457-7362 outside New York state)

Leak Investigation and Confirmation Steps

All leaks must be investigated by one of the following methods:

- System (tightness) test or
- Site check

Investigations must start within 48 hours of reporting a suspected leak. The investigation must be completed within 7 days of starting the investigation.

See Chapter 9 for more information on leak detection and confirmation steps.

8.4 Recordkeeping

Your 10-day inventory reconciliation worksheets must be kept for 3 years.

The following must also be maintained for 3 years:

- results of any sampling, testing or monitoring;
- written documentation for all calibration, maintenance and repair of leak detection equipment; and
- manufacturer's schedules for calibration and maintenance of leak detection equipment following installation.

All inventory records must be kept for 3 years.

8.5 Summary

- Inventory monitoring tracks all the changes to the amount of fuel in your system, from delivery to dispensing. It allows you to identify leaks from many different components of your fuel system.
- The reliability of inventory information is only as good as the care you take in your measurements and calculations.

- Inventory reconciliation must be done every 10 days.
- Your total variance must be less than the allowable variance. If it is greater than the allowable variance, you have to be able to explain this discrepancy. If you can't explain it, call the DEC Spill Hotline.
- Your electronic monitoring system must be able to measure both fuel and water level in your tank. It must be accurate within 1/8" to be used for inventory monitoring. Make sure your ATG has been calibrated for the tank at your site and has been programmed using your specific tank's tank chart.
- For manual measurements, your gauging stick must be clearly legible and in good condition. Sites that do not stick the tanks to the nearest 1/8" can expect to have significant inventory variances, and the results will not meet regulatory requirements.
- The best way to manually measure water in your tank is by using water-finding paste on your gauging stick. Be sure to use a paste that is compatible with your product.
- Whether you find the number of gallons pumped from your totalizer or from your point of sale system your meters need to be properly calibrated. The number of gallons dispensed must be metered and recorded to an accuracy of 6 cubic inches for every 5 gallons of product withdrawn.
- The delivery receipt should indicate both a "net" and a "gross" delivery volume. Use the gross volume as the number of gallons delivered for inventory monitoring calculations. The net volume is corrected for temperature and should NOT be used for inventory monitoring.
- When two tanks are siphoned or manifolded together, the inventory, sales and deliveries will be combined.
- Be sure your calculations use the correct blend ratio for blended products. Using the wrong blend ratio can give incorrect inventory results.
- If your variance is too high but the discrepancy can be explained, you must add your explanation to your inventory report.
- The inventory at your site should be consistent. If your site has major daily or ten-day total variances, investigate the cause. Do not expect a bounce back correction to occur.
- You must report any leaks or suspected leaks to DEC.
- Your 10-day inventory reconciliation sheets and leak detection test/maintenance documentation must be kept for 3 years.

9.0 Tank Leak Detection

Each of your underground storage tanks must be monitored for leaks by at least one method. The regulations allow for several different types of leak detection, depending on the date your tank was installed (see Table 9.1). The leak detection system for each tank must be listed on your facility registration application, and can be found on your Facility Information Report (see Chapter 4). The piping must have its own leak detection listed on system, as discussed in Chapter 10.0. It is important to remember that the requirements for piping leak detection are separate from the requirements for tank leak detection.

Tank leak detection systems must be able to detect a leak from any portion of the tank that routinely contains petroleum. Any monitoring system used for leak detection must be installed and calibrated in accordance with the manufacturer's instructions.

Any tank without a properly functioning leak detection system must be taken out-of-service.

The registered method of leak detection can be found on your facility registration (see Chapter 4). Although you are only required to have one method of leak detection, you may register more than one method. For example, a facility could be registered with interstitial monitoring as well as automatic tank gauging. If your registration indicates more than one registered method of leak detection, EACH method of leak detection MUST be monitored, maintained and documented.

The operator of any tank that contains any amount of motor fuel or kerosene that will be sold as part of a commercial transaction must also conduct inventory monitoring for that tank, as discussed in Chapter 8.0.

Indications of a leak should not be ignored. If your leak detection system indicates a potential leak, you must immediately investigate the cause of the alarm and determine if the system is leaking.

Suspected leaks must be reported to the DEC. The operator must report a suspected leak within the required time frame (see Section 9.6).

Figure 9.1: Monitoring console in alarm

Leak Detection

6 NYCRR 613-2.3

- NEVER ignore alarms.
- Suspected leaks must be reported to DEC.
- You must check your tanks for leaks and record leak test results at least once a week.
- You must keep your last 30 days of leak detection records onsite.

To determine what kind of leak detection method is permitted for your tanks, first see Table 9.1 below to identify the category of each tank. This chapter describes acceptable methods of leak detection for each tank category.

Table 9.1 Tank Categories

Tank Category	Installation Date
Category 1	Before December 27, 1986
Category 2	From 12/27/86 through October 11, 2015
Category 3	After October 11, 2015

Monitor the interstitial space and address all alarms in order to promptly detect fuel leaks into environment, should they occur.

9.1 Leak detection for Category 2 and 3 Tanks

Category 3 tanks MUST be double-walled. Category 2 tanks MUST be double-walled OR have another permitted method of secondary containment. Category 2 and 3 double-walled tanks MUST be monitored by interstitial monitoring. Alternative types of secondary containment for Category 2 tanks MUST be monitored by an appropriate method.

Interstitial Monitoring

Double-walled tanks have an interstitial space between the primary (inner) tank wall and the secondary (outer) tank wall. The interstitial space can be equipped with a sensor/indicator to detect leaks in the primary or secondary tank and may be either a dry or wet type. Both types are normally accessed through a manhole in the tank pad. It is important to understand which type of interstitial space is in your tank.

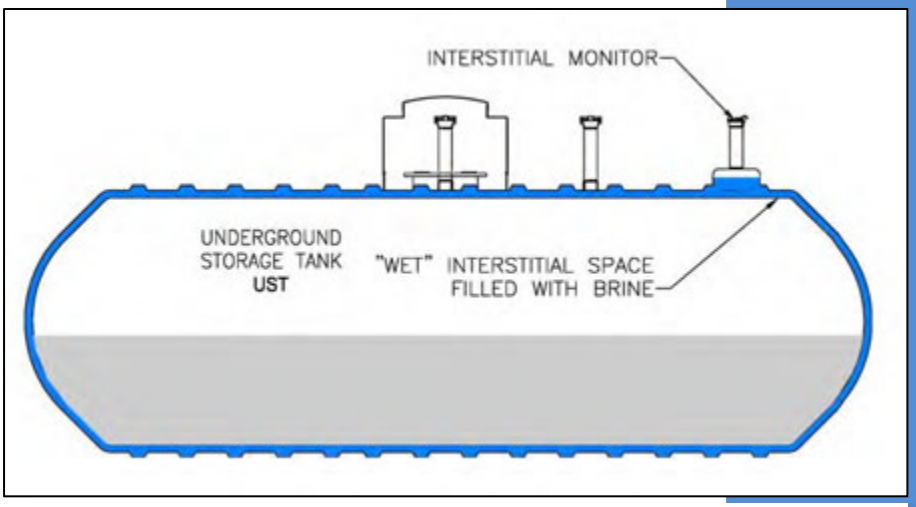


Figure 9.2: Wet interstitial space

A dry interstitial space is not intended to contain any liquid and should be free of liquid at all times. The presence of liquid in this space is an indication that the primary or secondary tank may be leaking. Usually, dry interstitial spaces are monitored with a sensor that detects the presence of liquid (product or

water) in the interstitial space. Some dry interstitial spaces are monitored using a vacuum or pressure system. Any change in the pressure or vacuum level of the interstitial space may indicate a leak in the primary or secondary tank.

A wet interstitial space contains a liquid brine solution (salt water). The brine solution is typically colored blue for easier detection. The interstitial space is connected to a reservoir where the brine level is monitored for any gains or losses. If the brine liquid level rises or falls by more than the amount specified by the manufacturer (typically a few inches) then either the primary or secondary tank may be leaking.

The interstitial monitoring may be done either electronically or manually. Electronic monitoring is done through an electronic monitoring console, while manual monitoring can be done using a dipstick or a pop-up indicator. Manual results of interstitial monitoring results must be recorded at least weekly. Where electronic monitoring methods are used, these systems must be inspected to ensure operability at least monthly. If the monitoring system goes into alarm, your tank may be leaking.

Secondary Barrier Monitoring

Secondary barrier monitoring is not a permitted monitoring method for new tanks, but you may have this system if you have older Category 2 tanks. Usually these tanks are single-walled tanks installed in a pit that is lined on all sides and bottom with a heavy plastic liner (i.e., the secondary barrier) and then filled with soil and/or gravel. The secondary barrier is sealed to the concrete tank pad to create an impermeable (liquid-tight) "tub" around the tank. A monitoring well is used to monitor the space between the tank and the barrier.

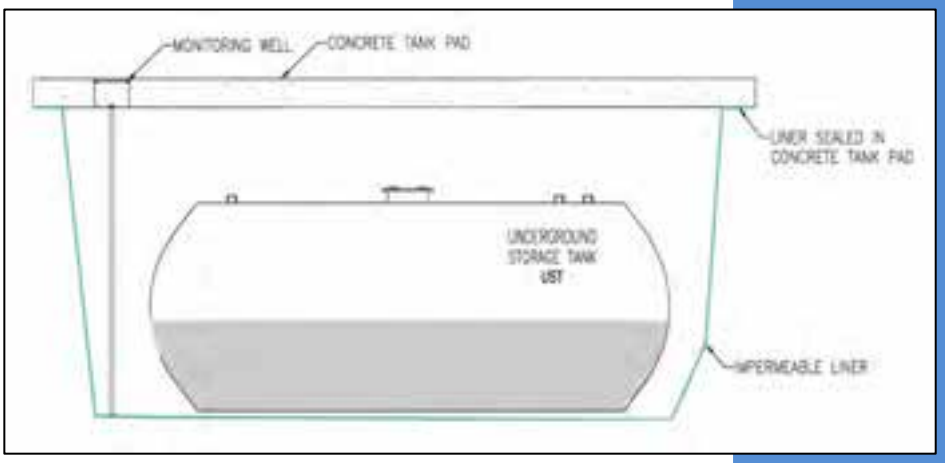


Figure 9.3: Tank system with a secondary barrier (shown in green)

Use of a secondary barrier is subject to a couple of requirements. The secondary barrier can only be used for tanks located above the 25-year floodplain. In addition, the barrier must be compatible with the product stored. For example, the product cannot cause the liner to rot or dissolve. The barrier must also not interfere with the cathodic protection system.

After the tank is installed, you will not be able to tell if your system has a secondary barrier by looking at the tank pad. Check your tank installation report or tank registration to see if you have a secondary barrier at your site.

Figure 9.4: Tanks being installed with a secondary barrier

Your must monitor your wells at least weekly, and document your monitoring results. If you find product in your wells, it means that a tank may be leaking.

9.2 Leak Detection for Category 1 Tanks

There are several different acceptable methods of leak detection for Category 1 tanks.

- Interstitial monitoring
- Automatic tank gauging
- Manual tank gauging
- Groundwater monitoring
- Vapor monitoring
- Statistical inventory reconciliation
- Other approved methods

Interstitial Monitoring

Interstitial monitoring detects leaks between the inner and outer walls of double-walled tanks, and is the preferred method of leak detection for double-walled Category 1 tanks. See Section 9.1 for a more detailed discussion.

Interstitial monitoring is the preferred method of leak detection for Category 1 double-walled tanks.

Automatic Tank Gauging (ATG)

Automatic tank gauging (ATG) systems can be programmed to conduct periodic tests of your tank system. During each test, the ATG probe will measure the product level and the temperature over a period of time. Your ATG probe must be capable of detecting a 0.2 gallon per hour (gph) leak rate with a 95% probability of detecting a leak. It must also have no more than a 5% probability of a false alarm. As an operator, you must determine if the equipment used to conduct a test meets the leak rate requirement.

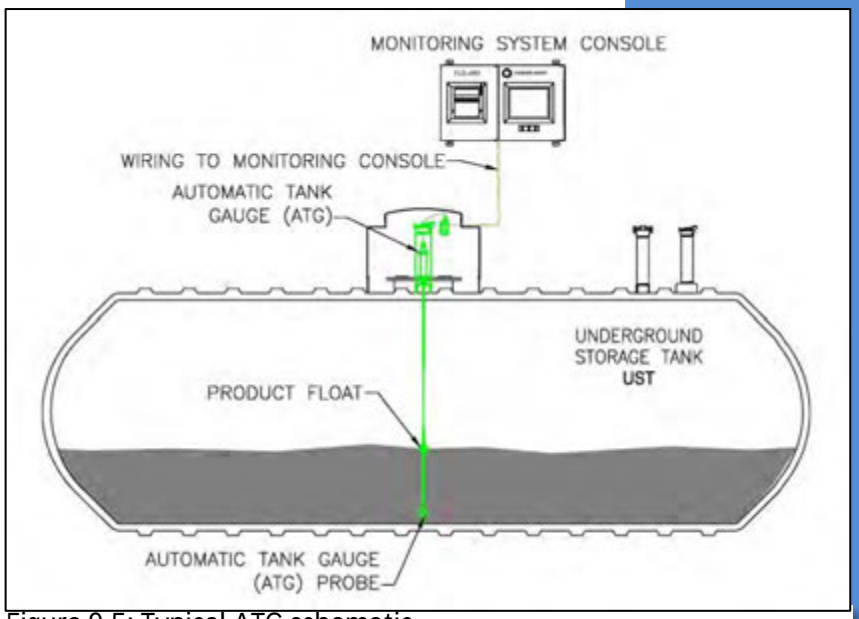


Figure 9.5: Typical ATG schematic

You can determine if your ATG meets the requirements by checking whether it is listed by the National Work Group on Leak Detection Evaluations (NWGLDE). NWGLDE listed systems meet the requirements. A link to the NWGLDE website is provided in Chapter 20.0. You can also have your tank contractor check whether your system meets the leak threshold requirements.

Figure 9.6: Example of an electronic monitoring console

Special considerations may apply to manifolded systems. For instance, if your tanks are connected by a siphon system, then your ATG system must be programmed to treat the siphoned tanks as a single, large tank.

There are two types of ATG leak detection tests: static or continuous.

Static Tests are conducted over a period of time (about 2 hours) during which the station does not dispense fuel or receive a delivery. The ATG is usually programmed to test the tank overnight while the facility is closed. Be sure the time of day is set correctly on the ATG so that the test does not occur during the day or when the system is in operation.

Continuous In-Tank Leak Detection System (CITLDS) Tests are conducted while the facility is operating. This type of test conducts product level and temperature measurements throughout the day whenever the system is idle. If you have a CITLDS system, typically the system is programmed to report a pass/fail test result at the end/beginning of each day. This type of test is also known as a Continuous Statistical Leak Detection (CSLD) test.

For either type of test, the tank must contain a minimum volume of product. The minimum volume depends on your tank and on the type of ATG you have. You must be sure that the tank is sufficiently full that the test will be able to check all parts of the tank that routinely contain product. You or your service technician must verify that these requirements are met.

In addition, you must have a passing test each week (for either method). You can use the form in Appendix D to record the results of the test.

Become familiar with the ATG at your facility. Know what type of test the ATG performs and when the tests are scheduled. You should also learn how to conduct an additional test at any time.

Your ATG console should be accessible AT ALL TIMES. You need to be able to see or hear alarms. You also need to be able to record test reports, usually by printing them out or writing them down. Keep the area around your console clear.

Figure 9.7: ATG console that is not accessible

Your ATG system is designed to go "into alarm" if your system has a leak. A red light will typically light up on your console if the system is "in alarm." Alarms can be triggered by tank sensors, sump sensors, product level probe or interstitial monitoring sensors. If an alarm is triggered be sure to investigate!

Never ignore any alarms. Figure 9.8 shows an ATG console in alarm. The alarm light is on and an alarm message is scrolling on the screen. A print out from the console details the alarm that is activated.

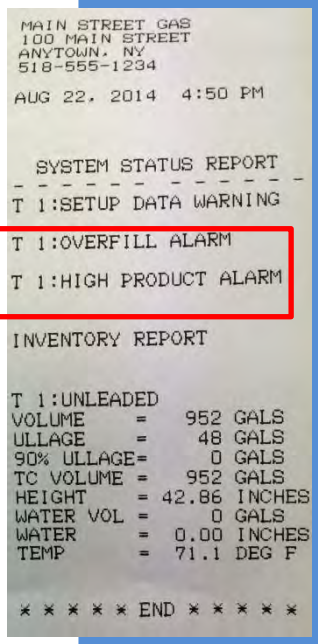


Figure 9.8: ATG console with an overfill alarm. The print out will indicate which alarms are current and need to be addressed

Manual Tank Gauging

Manual tank gauging (MTG) is based on measuring product levels with a gauging stick. The test can take from 36 to 58 hours, depending on the size of the tank. The tank cannot dispense or receive product during the test. Note: While this method seems similar to the process for inventory monitoring, it is NOT THE SAME; the only similarity between the two is that both use gauge sticks. Manual tank gauging is a leak detection method; inventory monitoring is not.

This method can ONLY be used for:

- Tanks less than 550 gallons; or
- Tanks 550-1,000 gallons with a diameter of 64 inches or 48 inches.

You will need:

- A tank gauging stick. The stick must be legible, in good condition, and accurate to 1/8″; and
- A tank chart that shows the volume of your tank vs. height of product. The chart must be accurate to 1/8″.

To manually gauge a tank you must measure the product level in the tank and then leave the tank undisturbed for a certain length of time (see Table 9.2). At the end of the test period you must measure the

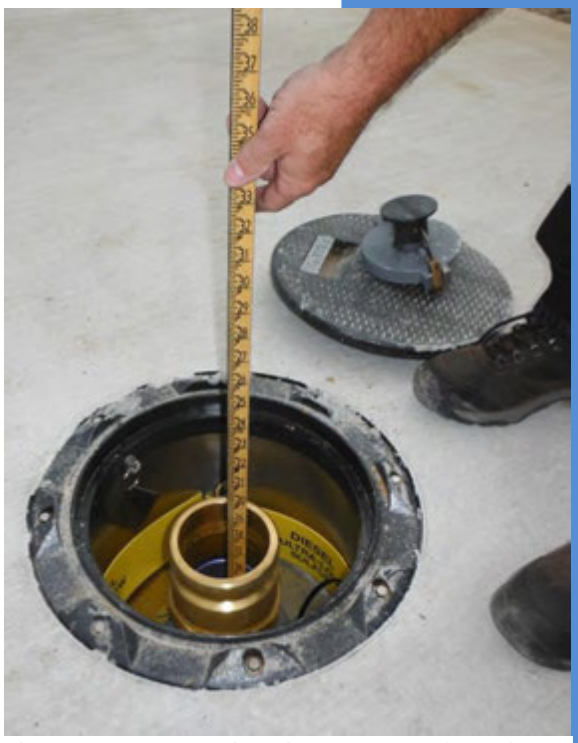


Figure 9.9: Measuring the amount of product in the tank

product level again and calculate the difference in tank volume. Manual tank gauging must be conducted weekly. The sample form in Appendix C shows an acceptable method to document the test.

To conduct a test:

1. Measure and record the product height in the tank to the nearest 1/8″.
2. Immediately re-measure and record the height of product in the tank to the nearest 1/8″.
3. Using the tank chart, calculate the volume of product in the tank for both initial measurements.
4. Calculate the average of the two volume measurements. This is your Average Initial Volume.
5. Record the date and time of the initial tank readings.
6. Wait for the minimum test period based on the tank volume (see Table 9.2). During the test period no product may be added or removed from the tank.
7. At the end of the test period measure and again record the product height to the nearest 1/8″.
8. Immediately re-measure and record the height of product in the tank to the nearest 1/8th of an inch
9. Using the tank chart, calculate the volume of product in the tank for both measurements.
10. Calculate the average of the two volume measurements. This is your Average Final Volume.
11. Record the date and time of the final tank readings.
12. Subtract the smaller of the average volumes (Initial or Final) from the larger average volume. This is the weekly standard volume variance allowed. Compare the loss or gain in volume to the Allowable Weekly Standard Volume Variance in Table 9.2.
13. Each month, average the 4 weekly standard volume variances and compare the average to the "Allowable Monthly Standard Volume Variance" in Table 9.2.

Record all data from a manual tank gauging test

Table 9.2: Manual Tank Gauging

Design Capacity of Tank	Minimum Duration of test	Allowable Weekly Standard Volume Variance (one test)	Allowable Monthly Standard Volume Variance (Four-test average)
550 gallons or less	36 hours	10 gallons	5 gallons
551-1,000 gallons (when **tank diameter is 64")**	44 hours	9 gallons	4 gallons
551-1000 gallons (when **tank diameter is 48")**	58 hours	12 gallons	6 gallons

If the difference between the average initial volume and the average final volume exceeds the allowable weekly or monthly variance, the tank may be leaking.

Groundwater monitoring is NOT recommended as a primary leak detection method.

Groundwater Monitoring

Groundwater monitoring is done by testing water in wells located close to your tank for possible petroleum contamination. Groundwater monitoring relies on discovering product in the groundwater AFTER the tank has leaked into the environment.

This method of leak detection is not commonly used and is not recommended.

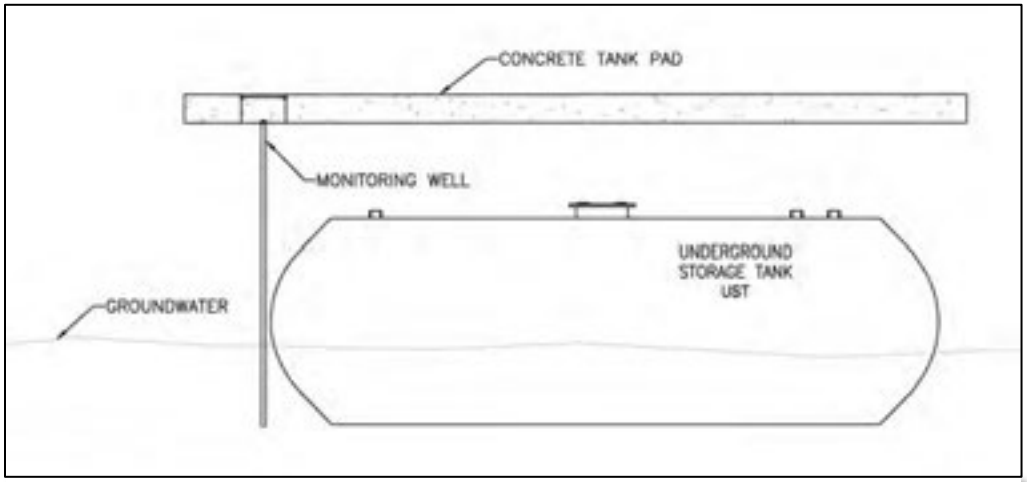


Figure 9.10: Groundwater monitoring system

Wells may only be installed in areas where groundwater is always within 20 feet of the ground surface. The groundwater monitoring wells are monitored at least weekly, either electronically or manually, and the monitoring system must be able to detect the presence of 1/8" of product

on top of the ground water. The monitoring wells must be clearly marked, as shown in Figure 9.11. Wells must also be secured to avoid unauthorized access and tampering.

If you find product in your wells, the tank may be leaking product into the groundwater at your facility.

Figure 9.11: Groundwater monitoring well

Vapor Monitoring

Vapor monitoring tests the vapor in the soil through monitoring wells around your tank for any significant increase in concentration of product or tracers. Vapor monitoring relies on discovering product in the soil AFTER the tank has leaked into the environment.

This method of leak detection is not commonly used and is not recommended.

This method only works if the product is volatile enough to generate a detectable vapor level, or if a volatile tracer chemical is added to the product. Monitoring wells or vapor probes are placed in the soil around the tank to monitor the soil vapor for product. The vapor monitoring system must be operable even in the presence of rain, groundwater or moisture in the soil for more than seven days. Background vapors must not interfere with the detection of leaks from the tank. The soil around the tank must consist of gravels, coarse to medium sands, course silt or other permeable materials; otherwise, vapors may not travel freely through the soil. The monitoring wells must be clearly marked and secured to avoid unauthorized access and tampering.

Statistical Inventory Reconciliation

Statistical inventory reconciliation (SIR) analyzes inventory data to detect leaks. The analysis must be conducted by a third-party and must be capable of detecting a leak of 0.2 gallons per hour with a 95% probability of detection and a 5% chance of a false alarm. The third-party report must include a quantitative result and a calculated leak rate.

The third-party will provide the operator with a report indicating the leak rate. The operator must review the information provided by the third-party to determine if the leak rate exceeds the acceptable leak rate of 0.2 gallons per hour.

Vapor monitoring is NOT recommended as a primary leak detection method.

A leak must be reported within 48 hours of determining the results of the statistical inventory analysis unless the results can be explained by factors that are not related to leakage, e.g. mistakes in recordkeeping.

Other Acceptable Methods of Leak Detection

DEC may approve an alternate leak detection method, if the method is capable of detecting a leak rate of 0.2 gallons per hour or a leak of 150 gallons within a month. The method must have a 95% probability of leak detection with a 5% probability of false alarm. The operator must be able to demonstrate that the method of leak detection meets these requirements and is as effective as the methods allowed in the regulation.

9.3 Maintenance and Operation of Leak Detection Equipment

The A, B and C operators at the facility must be familiar with their leak detection system and take appropriate actions when the system is in alarm. The system should be accessible to operators at all times and not locked in an office or storeroom. The operators should know immediately when the alarm goes on. In addition:

- All leak detection equipment must be installed, calibrated and maintained in accordance with the manufacturer's recommendations.
- Leak detection equipment must remain on and powered at all times. Do not disconnect the power to the system to silence an alarm.
- At least once a month the operator should inspect the system to record the system status, document test results and verify that the system is operating correctly. The form in Appendix D is one acceptable way to record inspections.
- Any necessary repairs to the system should be conducted immediately.
- Have a reliable tank service contractor on call to help you as needed.
- You should be familiar with the operation of your leak detection system. Many manufactures provide quick reference guides. Have the guide or a user's manual on hand and available. You can also ask your service contractor for training on the system.
- You must be familiar with each alarm in order to respond properly. Be sure you know the difference between a leak alarm and a low product alarm.

Maintain all leak detection equipment to prevent spills.

9.4 Recordkeeping

Facilities must meet the following recordkeeping requirements:

- You must keep the last 30 days of leak monitoring results at the facility at all times
- All leak detection records must be available for at least three years
- Records of any maintenance, repairs alarms, calibration or investigations must be available for 3 years.
- Refer to Chapter 15 for additional recordkeeping information

Note: Many ATG system use thermal printer paper to print test results and sensor status. This paper can fade over time and the necessary records may not be available. Along with keeping a scanned or electronic copy of the ATG print-out, consider keeping a written log with leak detection results.

9.5 Tank Tightness Testing

Tank tightness testing CANNOT be registered as a method of leak detection for tanks discussed in this guide; however, it CAN be used to determine if a tank system may be leaking. The test must be able to detect a leak at a rate of 0.1 gallons per hour from any portion of the tank that routinely contains petroleum.

There are several different types of tank tightness tests. A test is only valid if it is performed by a person who has been trained and certified by the manufacturer of the test method.

To have your tank tested for leaks, hire a third-party tank testing company. The technician must be certified to perform the tank testing method used. The tank testing company will bring all required equipment to complete the type of tank test performed.

You must keep a copy of the test results with your tank records until the tank system is tested again.

Figure 9.12: Technician performing a tank test

9.7 Leak Reporting

Leaks or suspected leaks must be reported to DEC within 2 HOURS.
THE DEC SPILL HOTLINE NUMBER IS 1-800-457-7362
(518-457-7362 outside New York State)

The following are examples of conditions that require reporting within 2 hours:

- Petroleum found outside of the tank system (spills) such as free product or vapors in soil, basements, utility lines, sewers or nearby surface water.
- Unusual operating conditions: (unless equipment is found to be defective and is IMMEDIATELY repaired or replaced)
    - Erratic behavior of dispensing equipment
    - Sudden loss of product from the tank system
    - Unexplained presence of water in the tank
    - Liquid (water/petroleum) in the dry interstitial space of the tank or any secondarily contained system
    - Liquid (water/petroleum) in a tank top or piping transition sump.
    - Loss or gain of fluid in wet interstitial space
    - Leak alarms
    - Failed ATG test
    - Failed tank tightness test
    - Suction dispenser loses suction

In addition, you must report within 48 hours:

- any result from statistical inventory reconciliation analysis that indicates a suspected leak.

NEVER ignore leak detection alarms

9.8 Leak Investigation and Confirmation

You must take certain steps to investigate possible leaks and to clean up confirmed leaks. See Chapter 14 for more information.

9.9 Summary

- Each of your underground storage tanks must be equipped with AT LEAST ONE leak detection system. Category 3 tanks and Category 2 double-walled tanks must have interstitial monitoring. Other methods may be allowed, depending on your tank category.

- Tank leak detection systems must be able to detect a leak from any portion of the tank that routinely contains petroleum.
- Indications of a leak should not be ignored. If your leak detection system indicates a potential leak, you must immediately investigate the cause of the alarm and determine if the system is leaking.
- Suspected leaks must be reported to the DEC. The operator must report a suspected leak within the required time frame.
- All leak detection equipment must be installed, calibrated and maintained in accordance with the manufacturer's recommendations.
- Any tank without a properly functioning leak detection system must be taken out-of-service.
- Leak detection equipment must remain on and powered at all times. Do not disconnect the power to the system to silence an alarm.
- You must keep the last 30 days of leak monitoring results at the facility at all times. All leak detection records must be available for a minimum of 3 years.
- Records of any maintenance, repairs alarms, calibration or investigations must be available for a minimum of 3 years.

10.0 Piping Leak Detection

Piping leaks can allow product to contaminate the soil and groundwater at your site. Piping leak detection methods allow you to monitor your underground piping so that you can detect and respond to possible leaks. Methods of piping leak detection are discussed in this chapter.

Leak detection is required for all piping that routinely contains petroleum and is in contact with the ground. Tank leak detection requirements and methods are different than piping leak detection requirements. Tank leak detection is covered in detail in Chapter 9.

Piping leak detection systems must be installed and calibrated according to the manufacturer's instructions. Piping without proper leak detection must be taken out-of-service.

Never ignore any alarms from your piping monitoring system. Alarms indicate a possible leak in your system and should be investigated right away.

Piping Leak Detection

6 NYCRR 613-2.3(b)(2)

- Monitor your piping to prevent leaks
- Pressurized and suction piping systems have different leak detection requirements.

Figure 10.1: Underground piping system connected to tank top sumps before being buried

Figure 10.2: Underground piping connected to dispenser sumps before being buried

10.1 Pressurized vs. Suction Piping Systems

Pressurized and suction piping systems have different leak detection requirements. The information in Chapter 3 can help you determine which type of system you have.

Pressurized Piping System: Pressurized piping systems are the most common fuel pumping method at retail motor-fuel operations. A pressurized system has a pump, usually called a submersible turbine pump (STP), located in the tank. The STP will pump product from the tank to your dispenser. If you have a pressurized system, you can see the submersible pump head when you look into your tank top sump. Figure 10.3 shows a sump containing a submersible pump head and product piping.

Submersible pumps operate under positive pressure. The high operating pressure means that leaks in underground piping served by these pumps can go unnoticed. This happens because the system acts like a garden hose with the faucet turned on full. Even if the hose has small holes in it, most of the water still comes out the nozzle. If you only look at the nozzle, you can't tell that water is also leaking out of the small holes. But if you leave the faucet open for a long time, water spraying from the small holes will eventually soak the ground. In much the same way, you can't tell that there are small leaks in pressurized underground piping just by looking at how fast product is dispensed. Over time, however, those small leaks of product can contaminate soil and groundwater at your site. Leaks from pressurized piping systems account for a large number of underground product releases.

Make sure you know what type of piping system you have at your site.

Check inside your tank top sump to determine which type of piping system you have.

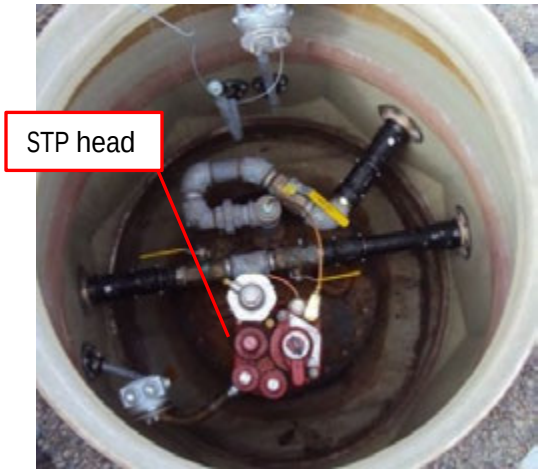


Figure 10.3: Pressurized pumping system

Figure 10.4: Suction pump system

Suction Piping System: A suction piping system has a pump located inside the dispenser, instead of in the tank. When you look into your tank top sump, you will find product piping but no pump. The pump in the dispenser draws product from the tank by suction. Pumping fuel with a suction system is similar to drinking water through a straw. A leak in the piping will cause the

system to lose suction, just as it is difficult to drink through a straw with a hole in it. If product leaks from the line or drains back to the tank, the suction pump has lost its prime. When the suction dispenser loses its prime, the pump will hesitate after it is turned on. A suction pump that will not pump or frequently loses its prime may have a line leak, a faulty check valve, or both.

The type of leak detection that is required for your tanks depends on the tank category and on whether you have pressurized or suction piping. You can use the information above, or check with your service technician, to determine what type of piping system you have. Table 10.1 will help you determine the category of your tanks. This chapter describes acceptable methods of leak detection for each tank category and piping type.

Table 10.1 Tank Categories

Category	Installation Date
Category 1	Tank installed before December 27, 1986
Category 2	Tank installed from 12/27/86 through October 11, 2015
Category 3	Tank installed after October 11, 2015

If you replace 50% or more of a single piping run, and the existing piping does not meet new piping standards, then the entire run must be replaced. All piping installed after October 11, 2015 must meet new piping requirements.

Piping in Category 3 tank system piping or NEW (i.e. replaced) piping must have interstitial monitoring unless the system meets **"safe suction"** criteria.

10.2 Leak Detection: Category 3 Tank Systems and New Piping

Piping connected to a *Category 3 tank system* or *new piping* that is installed in a Category 1 or 2 tank system must meet the following requirements for leak detection.

Pressurized Piping Systems – Category 3 and New Piping

Pressurized piping connected to Category 3 tank systems, or new pressurized piping connected to Category 1 or 2 tank systems, must have TWO types of leak detection:

- an automatic line leak detector (mechanical or electronic); AND
- weekly interstitial monitoring of the tank top sump (electronic or manual).

These leak detection methods are described below.

Automatic Line Leak Detector

Automatic line leak detectors (LLDs) can detect leaks in pressurized piping. Typically, LLDs are installed on the submersible turbine pump (STP) head in the tank top sump.

There are two types of LLDs: mechanical and electronic.

Mechanical LLDs (MLLDs) are mechanically operated pressure valves that detect a loss in piping line pressure each time the pump is turned off. Mechanical LLDs WILL NOT completely shut off flow to the pipe if they detect a leak. A MLLD will not trigger an audible or visual alarm when a leak occurs. The only way to tell that the MLLD has been triggered is by noticing that the fuel is now being dispensed at a very slow rate. If your normal flow is around 7-10 gallons per minute (gpm) a leak will be indicated by flow restricted to about 3 gpm or less.

Figure 10.5: Mechanical LLD (Alaska DEC)

Figure 10.6: Mechanical LLD (Alaska DEC)

A MLLD device is threaded into the top of the submersible pump head and has no wiring connections. The LLD may have a round or hexagonal top as shown in Figure 10.5 and Figure 10.6. Newer models will also have copper lines attached.

If you experience a slow flow condition, the line leak detector may be indicating a leak in the pipe. Investigate the system and do not ignore the signs of a leak.

Common problems with mechanical LLDs are listed below.

- Slow flow may be caused by conditions other than leaks, such as plugged filters or defective pump motors. Call your service technican immediately to investigate the cause of low flow.
- Cold temperatures overnight can cause a mechanical LLD to slow product flow first thing in the morning. If slow flow persists after your first dispensing period, call your service technican.
- LLDs can wear out. Mechanical LLDs typically need to be replaced every few years.

Electronic LLDs have an electronic detection element that connects to an electronic control panel and monitors for releases by looking for pressure losses in the piping. Unlike mechanical LLDs, electronic LLDs will completely shut down the submersible pump if they detect a leak. The shutdown will usually appear as an alarm on your ATG console or other monitoring device. Typically, electronic LLDs check for leaks of three gallons per hour, although some can also perform a 0.1 or 0.2 gallon per hour test.

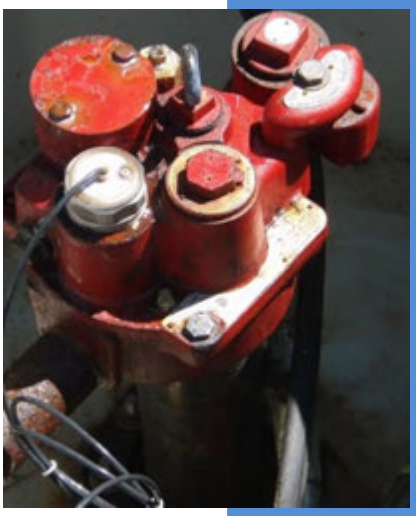


Figure 10.7: Electronic line leak detector on a submersible pump (EPA)

An electronic LLD is threaded into the submersible pump head. It is connected to the pump electrical system and is either hard wired or wirelessly connected. Figure 10.7 shows an electronic LLD on a submersible pump. Electronic LLDs are much more reliable indicators of leaks than mechanical LLDs.

If your pressurized piping does not have an LLD, then you must install one. Figure 10.8 is an example of submersible pump with no LLD. If your submersible pump is not equipped with an LLD, you should contact your service provider to discuss retrofit options.

Figure 10.8: Submersible pump with no LLD

Both mechanical and electronic LLDs must be designed to detect leaks of three gallons per hour.

You should check your records or check with your service provider to verify that your LLD meets the three gallons per hour requirement.

You are also required to test your LLD every year to ensure that it is operating properly. Records from LLD tests must be kept for three years.

Interstitial Monitoring for Double-walled Piping

Interstitial monitoring is the second leak detection method required for new pressurized piping systems.

Figure 10.9: Double-walled pipe

Remember from Chapter 3 that double-walled piping is a primary pipe encased inside a secondary pipe. Between the two walls is an interstitial space. The secondary pipe is designed to keep any leaks from the primary pipe contained inside the interstitial space. You must monitor the interstitial space in your double-walled piping for leaks at least weekly.

Leaks into the piping interstitial space will drain to liquid-tight sumps that are typically located where the piping connects to the tank top (tank top sump). Sumps are typically made of fiberglass or polyethylene plastic. Figure 10.10 shows a tank top sump with product from a piping leak.

Figure 10.10: Tank top sump with product

Figure 10.11 illustrates a typical double-walled piping system layout. The piping slopes down from the dispenser to the tank so that leaks from the primary pipe will drain down into the tank top sump. Leaks from equipment within the tank top sump will also be contained inside the sump. Leaks from piping inside the dispenser cabinet will be contained in the under-dispenser containment (UDC) sump.

Some systems may also include intermediate sumps, also known as transition sumps. Intermediate sumps are typically installed to break up long underground piping runs. Leaks from the primary pipe in these piping runs are contained in the intermediate sump.

Double-walled piping can be monitored electronically or manually.

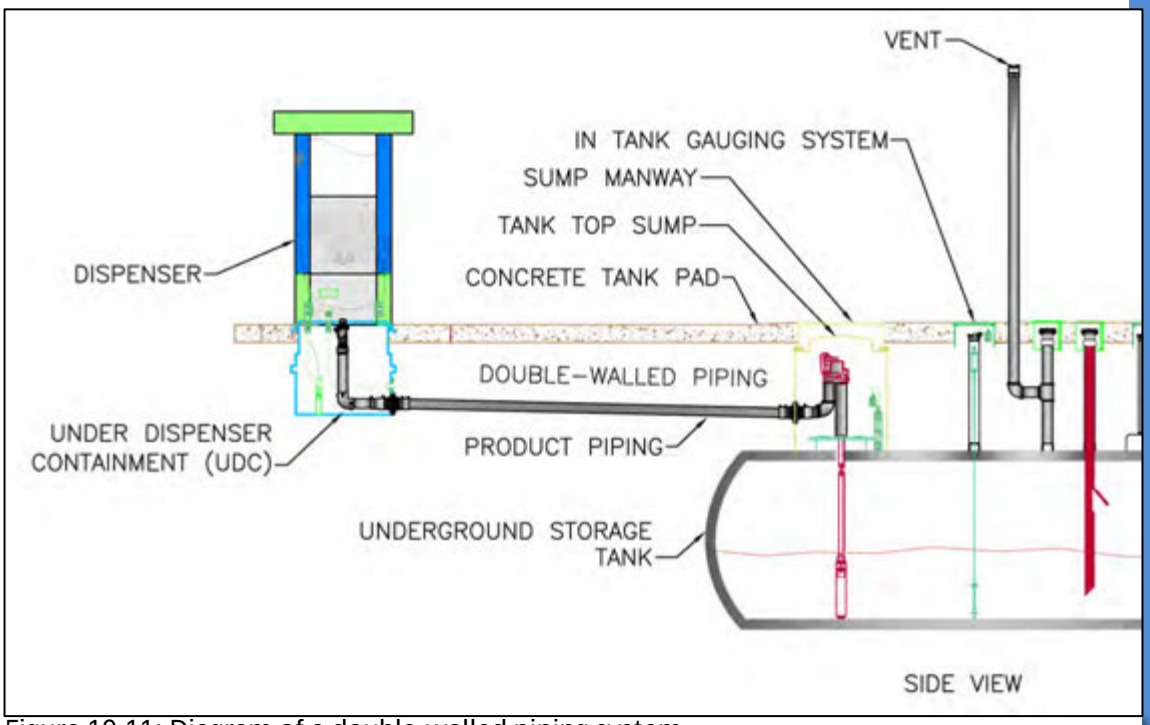


Figure 10.11: Diagram of a double-walled piping system

Electronic Interstitial Monitoring is often used to monitor piping systems for leaks. Many systems, like the one shown in Figure 10.12, combine fuel level monitoring by the automatic tank gauge (ATG) with continuous leak detection monitoring by leak sensors. Other systems may have a separate console just for leak detection. This particular system has sensors both in the tank top sump and in the UDC (Figure 10.13). The sensors will trigger an alarm at the console if liquid is detected in the sump or UDC.

Figure 10.12: Electronic monitoring console in alarm

There are two different types of leak detection sensors: discriminating and non-discriminating. Discriminating sensors can tell the difference between water and product and provide a separate alarm for each liquid. Non-discriminating sensors, which are more common, only tell you whether liquid is present. You will need to look in the sump to determine if it is product or water. If visual determination is difficult, you may find it helpful to test the liquid with sorbent pads that absorb only oil.

Sensors must be installed in accordance with manufacturer's instructions, which typically state that sensors must be installed vertically, with the bottom of the sensor within one inch of the bottom of the sump. Sensors should be tested each year to ensure they are in good working condition and are operating correctly.

Become familiar with your monitoring console and understand the alarm messages.

Tip: Keep a list of all the sensor locations with the sensor identification number posted close to your ATG console or release detection console. This will allow you or your service technician to easily locate which part of your piping system is causing the alarm.

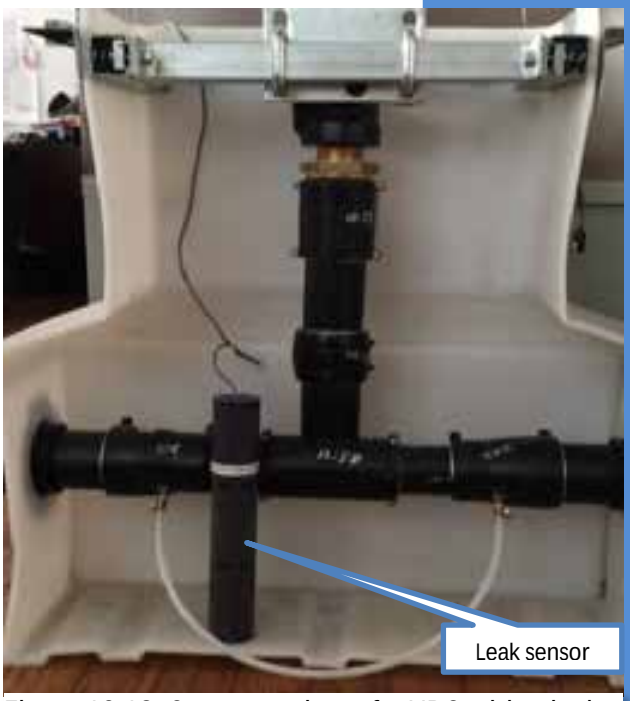


Figure 10.13: Cut-away view of a UDC with a leak sensor and plastic tubing connected to Schrader valves. Note the correct (vertical) orientation of the sensor.

Common problems with electronic interstitial monitoring:

- Water is present in the tank top sump. If you have frequent alarms due to water in your tank top sump, talk to your service technician about options to fix the problem.
- Sumps are not liquid tight. Leaks from your sumps can allow product to escape into the environment before the sensors detect them. It is a recommended practice to test your sumps periodically to make sure they are still liquid tight.
- Schrader valves are closed. Schrader valves are similar to the valves used to fill tires. They are typically installed where double-walled piping transitions to single walled piping. Two Schrader valves, which may be connected with plastic tubing, close off the interstitial space. These valves should ONLY be connected during tightness testing of the double-walled pipe. They *must* be opened or removed during normal operation in order for leaks to be detected.

  If the Schrader valves are not opened or removed, leaks from the primary piping will be trapped inside the interstitial space instead of flowing into the sump. This will prevent your sump sensors from triggering the alarm when you have a leak. To keep your system operating properly, you MUST open the Schrader valves and disconnect tubing between the valves during normal operation. This will allow leaks to reach your sump sensor and trigger your warning alarm.

If either your ATG console or leak detection console is in alarm take the following steps:

- Visually inspect all sumps to determine if product is present.
- Stop dispensing product until the alarm can be identified and corrected. Shut off power to the submersible pump to prevent additional releases to the environment. Otherwise, the submersible pump will pressurize the line each time a dispenser is used, potentially causing additional product to be released into the environment.
- Contact your service technician immediately to determine the cause of the alarm.
- Have a tightness test performed on the piping.
- Report any alarms or the presence of fuel or water in sumps within 2 hours to the DEC (see Chapter 14 for more information about reporting leaks).

Manual Interstitial Monitoring must be performed if you do not use an electronic monitoring system. To conduct manual interstitial monitoring you must open each sump weekly to visually inspect for water or fuel.

If you discover product in your sump:

- Turn off the pump

Never ignore piping leak detection alarms on your ATG console.

- Contact your service technician
- Have a tightness test performed on the line.
- Report any alarms or the presence of product in sumps within 2 hours to the DEC (see Chapter 14 for more information about reporting leaks).

If you discover water in your sump, you should remove and properly dispose of the water, then diagnose and fix the cause of the water intrusion.

Suction Piping Systems – Category 3 and New Piping

It is relatively easy to tell if a suction piping system has a hole in it because it will not operate properly. The pump may make unusual noises when it is first turned on and it will take longer than usual for product to come out of the nozzle. These symptoms are caused by air entering the hole in the pipe, known as losing the prime. Loss of prime could also be the result of a faulty check valve.

Figure 10.14: Suction system dispenser

Suction piping systems have a check valve to keep the piping and pump full of liquid when the pump is turned off. The check valve is a one-way valve that opens whenever product is flowing through the dispenser nozzle, and closes automatically when the pump is turned off, in order to keep product from flowing back to the tank.

You must monitor your suction piping, using a permitted leak detection method, UNLESS the system is designed to meet ALL the following safe suction (also known as *European suction*) criteria:

- The underground piping operates at less than atmospheric pressure (i.e.: under suction);
- The underground piping is sloped so that the contents of the pipe will drain back into the tank if the suction is released;
- there is only one check valve in each suction line;
- the check valve is located directly below and as close as possible to the suction pump (directly under the dispenser). Placement of the check valve is crucial to ensuring that product flows back to the tank and not into the environment.

Suction systems that do not meet the safe suction criteria are known as "American" suction systems and must be monitored for leaks.

New piping systems that do not meet the safe suction criteria must have weekly interstitial monitoring as the primary leak detection.

10.3 Leak Detection: Piping Connected to Category 1 or 2 Tank Systems

Existing piping connected to a Category 1 or 2 tank system must meet the following requirements for leak detection. New piping connected to a Category 1 or 2 tank system must meet the leak detection requirements for new piping.

Pressurized Piping Systems – Tank System Category 1 or 2

Pressurized piping connected to Category 1 or 2 tank systems must have two methods of leak detection.

- automatic line leak detector (mechanical or electrical)

AND one or more of the following:

- weekly interstitial monitoring (manual or electronic); OR
- other permitted type of weekly monitoring methods; OR
- annual line tightness test.

Automatic line leak detectors work for Category 1 and 2 systems in the same way as for Category 3 systems (see Section 10.2).

Interstitial monitoring is conducted for Category 1 and 2 systems in the same way as for Category 3 systems (again, see Section 10.2).

If you use one of the other weekly monitoring methods, monitoring must be conducted for all portions of piping that normally contain petroleum. The permitted alternatives include the following:

- Vapor monitoring
- Groundwater monitoring
- Statistical inventory reconciliation (SIR)

Vapor monitoring, groundwater monitoring, and SIR are described in Chapter 9. Groundwater and vapor monitoring rely on discovering product in the groundwater or soil AFTER product has leaked into the environment and are difficult to implement for piping leak detection. These two methods therefore are NOT RECOMMENDED.

Vapor monitoring and groundwater monitoring are not recommended piping leak detection methods.

If you use annual line tightness tests as your piping leak detection method, the test must be capable of detecting a leak at a rate of 0.1 gallons per hour. The tests must be performed by a certified technician, and you must retain the test documentation for three years.

Suction Piping Systems – Tank System Category 1 or 2

Suction piping connected to Category 1 or 2 tank systems must be monitored using:

- weekly interstitial monitoring (manual or electronic); OR
- other permitted type of weekly monitoring methods; OR
- line tightness test every three years.

Allowable weekly monitoring and line tightness testing methods are the same as for pressurized piping connected to Category 1 and 2 tank systems. Safe suction systems are exempt from piping leaking detection requirements.

10.4 Operation and Maintenance of Piping Leak Detection Equipment

All leak detection equipment (mechanical or electronic) must be installed, calibrated and maintained according to the manufacturer's instructions.

Automatic line leak detectors must be tested each year by a certified technician to ensure proper operation. You should also test your other monitoring system components (e.g., sensors, alarm, and console readouts) each year.

Any leak detection equipment that is not working properly must be repaired or replaced immediately.

10.5 Leak Reporting and Investigation

Reporting

Suspected leaks must be reported to DEC within 2 HOURS.

THE DEC SPILL HOTLINE NUMBER IS 1-800-457-7362

(518-457-7362 outside New York State)

The following are some unusual operating conditions related to piping which require reporting with 2 hours unless equipment is found to be defective and is IMMEDIATELY repaired or replaced:

- Dispensers operating at a restricted flow rate (around 3 gallons per minute or less) due to an automatic line leak detector restricting flow (tell-tale sign: customers complain about unusually long fill up times);
- Liquid (water/petroleum) in the tank top or intermediate sump;
- Sump sensor alarms;
- Failed line tightness test; or
- Suction dispenser loses suction (prime).

Never ignore signs of a leak from your piping. Suspected leaks must be reported even if they occur on a weekend or a holiday.

Leak Investigation and Confirmation

You must take certain steps to investigate possible leaks and to clean up confirmed leaks. See Chapter 14 for more information.

Maintain results of sampling, testing, and monitoring for at least 3 years.

10.6 Recordkeeping

The following records must be retained for at least 3 years:

- records of any sampling, testing or monitoring;
- all calibration, maintenance and repair records for all leak detection equipment that is permanently located on site and; and
- schedule of required calibration and maintenance provided by the leak detection manufacturer after installation.

Line tightness testing results must be retained AT LEAST until the next test is conducted.

You should keep all leak detection records in a log book. The book should be easily accessible and available at all times. In addition, consider creating a log of (or print out) all leak detection results from your electronic monitoring system. The thermal paper your ATG console prints on can fade, so you should make more permanent copies (e.g. electronic scans, paper photocopies, or written logs) that can be kept for the required three years.

Requirements for piping leak detection are summarized in Table 10.2.

Table 10.2 Piping Leak Detection Requirements

Tank System	Piping System	Leak Detection
Category 3[+]	Pressurized	ALLD AND Weekly interstitial monitoring
	Suction[++]	Weekly interstitial monitoring

Category 1 or 2	Pressurized	ALLD AND one of the following:
		• Annual line tightness test; OR
		• Weekly interstitial monitoring; OR
		• Weekly monitoring – one of:
		  ○ Vapor monitoring[+++]
		  ○ Groundwater monitoring[+++]
		  ○ SIR[+++]

	Suction[++]	Line tightness test every three years; OR interstitial monitoring; OR Weekly monitoring – one of: • Vapor monitoring[+++] • Groundwater monitoring[+++] • SIR[+++]

[+] Also includes new piping systems installed for Category 1 and 2 tank systems.
[++] Leak detection not required for suction systems that meet "safe suction" criteria (see text).
[+++]These leak detection methods are not recommended.

10.7 Summary

- Piping leaks can allow product to contaminate the soil and groundwater at your site. Piping leak detection methods allow you to monitor your underground piping to detect possible leaks. Leak detection is required for piping that routinely contains petroleum and is in contact with the ground.

- Category 3 tank systems and new piping connected to Category 1 and 2 systems must meet Category 3 requirements, including the requirement for double-walled piping (except "safe suction systems").

- Pressurized piping systems must have two types of leak detection:
  - an automatic line leak detector (mechanical or electronic); *and*
  - weekly monitoring (must be interstitial for Category 3 systems).
  - Category 1 or 2 systems may substitute annual line testing for weekly monitoring.

- Suction piping systems must be monitored weekly (must be interstitial for Category 3 systems), unless they meet criteria for "safe suction" systems.

  - Category 1 or 2 systems may substitute line testing at three-year intervals for weekly monitoring.

- Piping leak detection systems must be installed and calibrated according to the manufacturer's instructions. Piping without proper leak detection must be taken out-of-service.

- Never ignore any alarms from your piping monitoring system. Alarms indicate a possible leak in your system and should be investigated right away.

11.0 Cathodic Protection (Corrosion Protection)

Cathodic protection (CP) - also known as corrosion protection - applies to steel tank systems and steel piping. Without cathodic protection, underground metal tank systems will corrode (rust) and may leak product into the environment. Corrosion can attack the steel uniformly or create a hole in a small, localized area (see Figure 11.1). Localized corrosion is the most common form of corrosion. Given the right environmental conditions, localized corrosion can create a leak in an unprotected tank or pipe in a very short time. It is YOUR responsibility to maintain your CP system so that your UST system remains protected from corrosion.

New York's PBS regulations state that underground steel components and any other UST system components that are not corrosion resistant MUST be protected against corrosion.

Corrosion can be prevented by:

- using non-metallic components such as fiberglass,
- coating the metal to isolate it from soil and groundwater, and/or
- using a cathodic protection (CP) system.

Certain non-metallic materials, like fiberglass, do not corrode. Therefore, components made from these types of materials do not need CP.

Note: A CP system only protects the outside of the tank system that is in contact with soil. CP does not protect against corrosion that starts from the inside of your tank, which often occurs due to water in the tank. It is important to keep water out of your tanks.

Cathodic Protection
6 NYCRR 613-2.1(b)(1) and (613-2.2(b)

- Maintain your CP system to prevent leaks

Figure 11.1: Corroded tank

11.1 Cathodic Protection Requirements

Buried steel UST system components, including tanks or piping, that routinely contain petroleum must be protected from corrosion. CP systems must be designed, fabricated and installed according to one of the codes of practice listed in the PBS regulations. Every field-installed cathodic protection system must be designed by a corrosion expert.

For the cathodic protection system to work correctly, tanks must be electrically isolated from other metal objects unless the CP system is designed to also protect the other metal objects. A cathodic protection tester can determine if your system is electrically isolated.

All steel piping that routinely contains petroleum and is in contact with the ground MUST be cathodically protected. Cathodic protection for steel piping must:

- include a pipe coating system made of a suitable dielectric material,
- be designed and installed according to the codes of practice listed in the regulations,
- be designed by a corrosion expert, and
- be properly maintained and operated, including required testing.

Metal piping or fittings that have leaked petroleum due to damage or corrosion cannot be repaired, but must be replaced. For piping systems that do not meet new piping requirements, if 50% or more of a piping run needs to be replaced, then you must replace the entire piping run. The replacement piping must meet the standards in effect at the time of installation (including requirements for double-walled piping, if applicable).

Non-corrodible pipes and fittings may be repaired in accordance with manufacturer's specifications.

11.2 Galvanic Systems

Galvanic cathodic protection systems are the most common type of cathodic protection. They are relatively easy to install and maintain because they do not require a connection to an electrical power circuit. In galvanic CP systems, sacrificial anodes attached to the tank provide CP (Figure 11.2). Corrosion then occurs at the anodes instead of the tank or piping. However, the system may fail over time as the anodes corrode away. Therefore, these systems must be tested annually by a qualified corrosion tester.

Figure 11.2: Steel tank with sacrificial anodes (EPA)

It is difficult to check whether you have a galvanic corrosion system because all the components are buried. However, a CP tester can determine whether your steel tanks and piping are:

- cathodically protected;
- receiving adequate levels of protection; and
- electrically isolated from other metal components such as electrical conduits.

Figure 11.3: Rectifier

11.3 Impressed Current Systems

In contrast to galvanic systems, impressed current systems require an electric power source. These systems are typically connected through a rectifier to the same electric service as the pumps, dispensers, lights, etc. at your facility. The rectifier powers buried anodes that create electrical currents to protect your steel tanks and/or steel piping (see Figure 11.3 and Figure 11.4 for examples of rectifiers).

The rectifier MUST be powered on at ALL times to properly protect your tank from corrosion. Do NOT turn off the rectifier and do NOT shut off the circuit breaker it is connected to.

Most rectifiers are equipped with voltmeters and ammeters to monitor system voltage and electrical current/amperage (see figures). These readings will help you to determine if your system is operating properly.

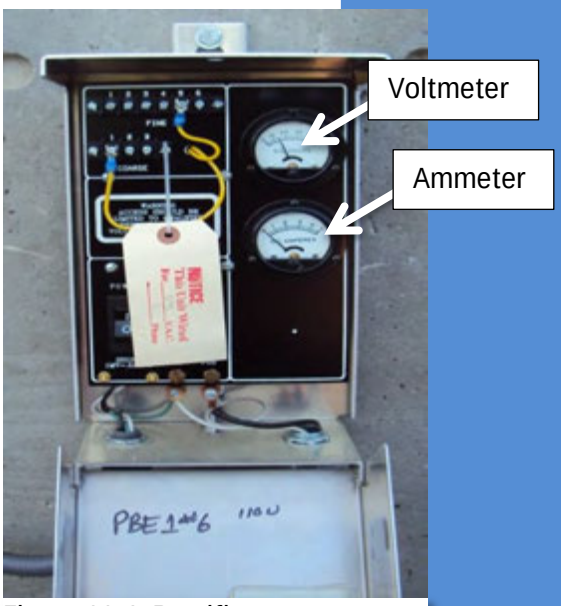


Figure 11.4: Rectifier

11.4 Inspection and Testing

All CP systems must be tested YEARLY by a qualified CP tester. The test must conform to one of the codes of practice listed in the PBS regulations.

In addition impressed current systems must be inspected every 60 days to verify that the rectifier is on and is operating properly. This inspection may be performed by facility personnel or a service contractor. 60-day inspections are not required for galvanic CP systems.

Galvanic and Impressed Current System Testing

Your CP system (impressed or galvanic) must be tested:

- six months after installation; and
- EVERY year, starting after the initial six month test.

The testing MUST be performed by a qualified CP tester. A qualified CP tester must have the training and experience to properly perform the testing.

The testing does not require any excavation. For an impressed current system, the rectifier MUST be turned off during the test. Be sure that your rectifier is not blocked by store merchandise or equipment, so that the CP tester can easily reach it. Also, keep access clear to the test port by your tank. Be sure that this port is not paved over when re-paving is done at your facility. Check that the rectifier is turned back on when the test is complete.

The CP tester will provide you with test results that indicate whether your system is adequately protected. Keep these records in accordance with Section 11.6. If your system is not adequately protected, make repairs immediately and retest the cathodic protection system within six months.

Your CP system must be tested YEARLY

All CP annual tests MUST be performed by a certified tester

60-Day Inspections for Impressed Current System Inspection

If you have an impressed current system, you MUST inspect your rectifier every 60 days. This inspection is in addition to the yearly CP test described in the previous section. You may do the 60-day inspection yourself, or have a contractor do it.

To perform your 60-day inspection you must:

1. Check to make sure your rectifier is on;
2. Record the volts shown on the voltmeter;
3. Record the amps shown on the ammeter;
4. Record the number of hours of operation;
5. Compare the volts and amps you recorded to the volts and amps that were recorded when the system was installed. There should be a sticker on your rectifier stating the voltage and amps recorded at installation;
6. Repair the CP system if the readings are outside the allowable range (see below);

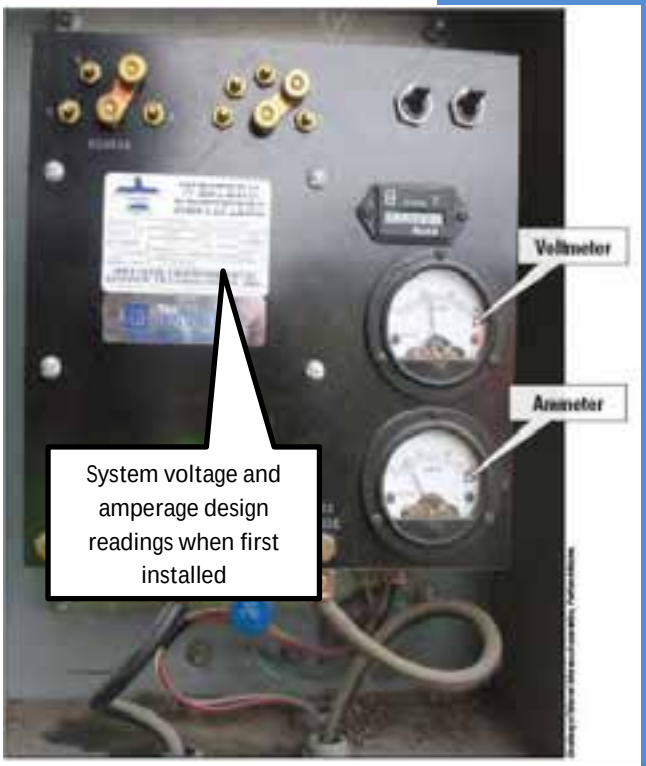


Figure 11.5: 60-day rectifier test (Maine DEP)

7. Compare the number of hours to the previous total hours to verify that the system has been on continuously (see below). Take appropriate action if it has not.
8. File your inspection report with your tank records and maintain it for at least 3 years.

See Appendix E for a sample 60-day inspection log.

To check voltage and current readings, you need to know the allowable range of the voltage and current/amperage readings.

The voltage and amperage readings on the rectifier will be different for every facility. However, the actual numbers are not important. What IS important is that the numbers do not change over time. This means that the numbers should be within 10% of the readings when the system was first installed. The installation readings will be printed or written on the sticker on your rectifier. If your readings are more than 10% higher or lower than the installation readings, then something is wrong with your CP system. Contact a corrosion expert to check your system.

To check for continuous operation, you need to know how long the impressed current system has been working.

After recording the current total hours, subtract the previous total from the current total. Divide the number of hours by 24 and compare to the number of days since the last reading. Note: 30 days = 720 hours; 60 days = 1440 hours. These numbers should be the same. If they are not, determine the cause and correct it. Be sure that facility employees know that they must not turn off the rectifier or the circuit breaker that controls it. If necessary, contact an electrician or CP technician to repair the system.

DO NOT ignore failing cathodic protection tests or 60-day rectifier inspections!

If your system fails a CP test or rectifier inspection, you must repair the system immediately. Without proper cathodic protection, steel tanks and piping can rapidly corrode and release petroleum to soil or groundwater at your facility.

11.5 Repairs to Cathodic Protection Systems

Eventually your CP system will need repairs. Repairs made to cathodic protection systems should be made by a certified cathodic protection expert and must be installed to the codes of practice listed in the PBS regulations. Once your CP system is repaired you must conduct a CP test within 6 months of the repair, and continue testing each year as described in Section 11.4.

Keep in mind that any repairs or upgrades being made to your site or UST system could damage your CP system. If you have an impressed current system, be especially aware of any site excavation work. Make sure that excavation work does not damage the underground wires that

travel from your rectifier to your tank. The CP system must be tested within 6 months after any repairs are made to the tanks or piping.

11.6 Recordkeeping

All cathodic protection testing results and inspection logs MUST be maintained for 3 years. Keep your documents well organized, and store them in a place where you can access them quickly. See Appendix E for a sample 60-day inspection log and Appendix F for a sample maintenance record form.

In addition to your testing records, maintain all records of repairs until the system is closed.

You are required to complete a CP system test within 6 months of any repair to the CP system

11.7 Summary

- Cathodic protection is vital to the maintenance of any steel UST systems at your site.
- Corrosion protection systems must be maintained to protect steel tanks and piping from rusting.
- Cathodic protection systems must be inspected by a certified cathodic protection tester within 6 months of installation and every year after that.
- Impressed current cathodic protection systems must be inspected every 60 days to ensure the system is operating properly.
- Cathodic protection compliance records must be kept for at least 3 years.
- Repairs to a cathodic protection system must be tested in accordance with a referenced standard within 6 months of the repair.

Cathodic protection records MUST be kept for 3 years

6 NYCRR 613-1.1 lists cathodic protection standards that apply to underground tanks. For additional information about cathodic protection systems and training of corrosion professionals see the NACE International website www.nace.org.

12.0 Dispensers

Most facilities with underground storage tanks are connected to dispensers by underground piping. In addition to piping, dispensers may contain filters, pumps, multiple joints, and valves. Each of these components is a potential site for leaks to occur. Understanding the components of your dispenser and performing proper maintenance can help you prevent leaks into the environment. Inspection and maintenance of dispensers is your responsibility. You should visually inspect your dispensing equipment daily to ensure it is working properly and leak free.

Figure 12.1, Figure 12.3, and Figure 12.2 show different types of dispensers that may be present at your site. Dispensers come in many different shapes, sizes and colors but they are all required to have some of the same features.

Dispensers
NYCRR 613-2.1(b)(5)

- UDCs are required for all new dispensers
- All pressurized systems must have a shear valve
- Dispensers must be calibrated to record the proper amount of fuel dispensed.

Figure 12.1: Typical fleet dispenser

Figure 12.3: Typical retail dispenser providing three different products

Figure 12.2: Typical retail dispenser

Typical Parts of a Dispenser

Typical dispensers are made up of the following parts:

- dispenser cabinet
- product hose
- breakaway
- swivel fitting
- nozzle
- shear/crash valve – must be properly anchored to the concrete island
- under-dispenser containment sump (UDC)

The locations of these parts are shown in Figure 12.4 In addition, most dispensers also contain a filter and a totalizer (which measures total product dispensed) inside the dispenser cabinet.

Make sure you have a key to your dispenser cabinet available at all times for maintenance and periodic inspection.

You should complete periodic inspections of your dispenser and dispensing equipment. The Petroleum Equipment Institute (PEI) publishes a document titled *Recommended Practices for Inspection and Maintenance of Motor Fuel Equipment (RP500)* that includes detailed instructions and checklists for completing daily, monthly and annual dispenser inspections.

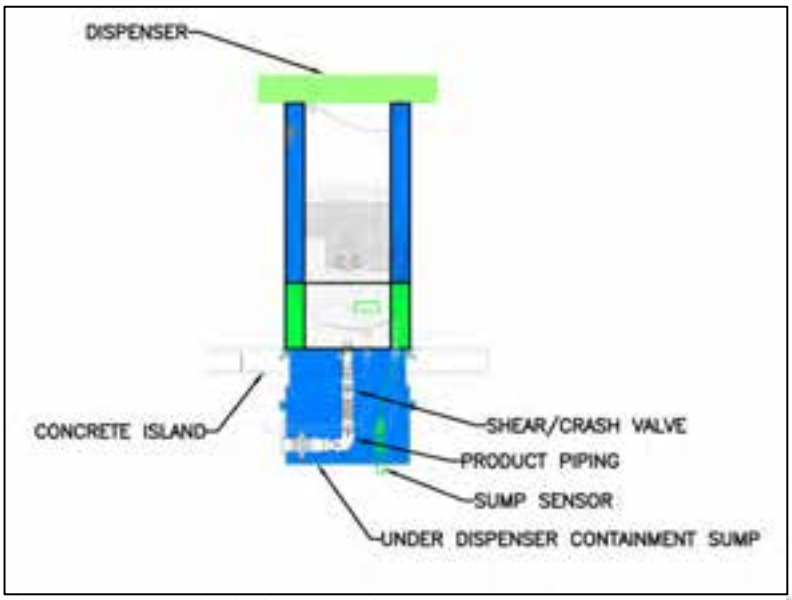


Figure 12.4: Typical dispenser layout

Make sure you have a key to your dispenser cabinet available at all times

12.1 Dispensing Equipment

Pumps: Pressurized vs. Suction Systems

Your dispenser is part of either a suction system or a pressurized system. In a suction system (see Figure 12.5), the system pump is inside the dispenser and "sucks" product from the tank.

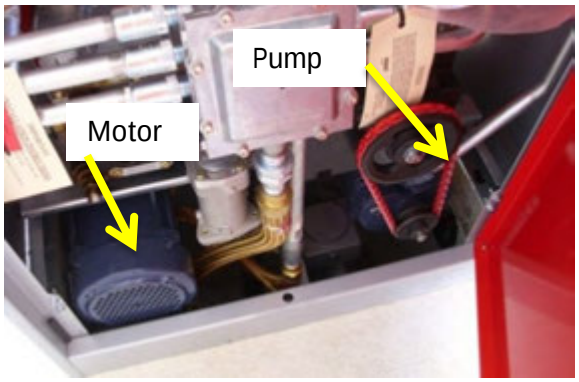


Figure 12.5: Suction system dispenser

Figure 12.6: Pressurized system dispenser

In a pressurized system, the system pump is inside the tank instead of inside the dispenser (see Figure 12.6) and the pump "pushes" product to the dispenser. Suction and pressurized systems must meet different regulatory requirements, so it is important to know which type of system you have. If you can see a pump and motor inside your dispenser, you have a suction system. You can also listen when you activate the dispenser. If you can hear a pump and motor start, then there is a good chance it is a suction dispenser.

Dispensers with Blended Products

Some dispensers are tied to blending systems that mix low- and high-grade products from separate tanks to create a midgrade product. These dispensers could have one nozzle, similar to the dispenser shown in Figure 12.7. Dispensers that provide blended fuels may also have three different product nozzles.

The blended mid-grade product is mixed inside the dispenser just before it is dispensed.

Figure 12.7: Typical retail dispenser with blending to dispense 3 grades of fuel

Piping

Buried steel pipe connected to the dispenser must be protected from corrosion by an approved protective coating and/or cathodic protection (see Chapter 11). Alternatively, the piping may be routed through a corrosion resistant sleeve that isolates the piping from soil and groundwater. Both ends of the sleeve must be protected from contact with soil.

12.2 Under-dispenser Containment

Under-dispenser containment (UDC) – or simply, a dispenser sump - is designed to contain leaks from the dispenser piping. The UDC sits beneath your dispenser as shown in Figure 12.8. UDCs typically contain the following:

- valves
- piping
- buried risers
- flex connectors
- sump sensor
- electrical conduit

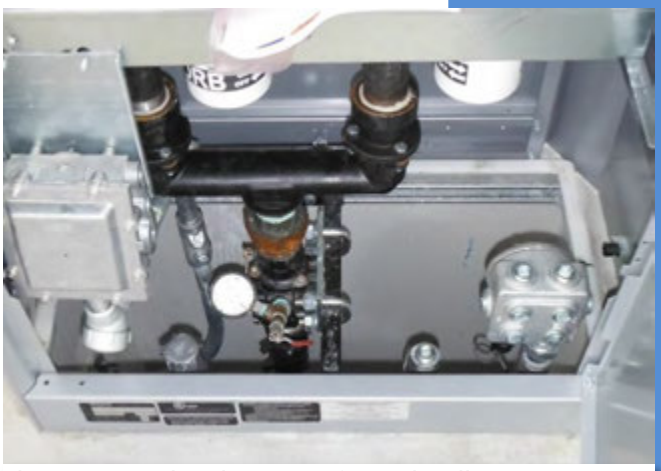


Figure 12.8: View into UDC from the dispenser cabinet

UDCs are required for all new dispensers. Dispensers are considered new when both the dispenser and the equipment needed to connect the dispenser to the UST are installed at a facility. The connecting equipment includes check valves, shear valves, unburied risers, flexible connectors, or other transitional components installed beneath the dispenser and connected to underground piping.

Figure 12.9 *shows a UDC before burial. Underground piping and conduit enter the UDC where they transition to dispenser piping.*

UDCs may be made of fiberglass, steel or HDPE plastic. When you open the door to your dispenser cabinet and look inside, you should be able to see your UDC.

UDCs MUST be liquid tight on all sides, on the bottom, and at any penetrations (i.e. where the underground piping and conduit enter the UDC). In addition, your UDC must allow for visual inspection and access to the components (dispenser piping) contained within the

Figure 12.9: UDC with a steel island before burial, showing underground piping and conduit connections.

UDC. If UDCs cannot be visually inspected then they are required to be continuously monitored for leaks from the dispenser system.

12.3 Valves

Shear Valves

Every dispenser that is part of a pressurized piping system must be equipped with a shear valve, also known as a crash valve or impact valve. When properly installed, a shear valve that meets NFPA 30A standards satisfies the regulatory requirement. The shear valve is designed to stop product flow from the pressurized pipe if your dispenser is dislodged or struck by a vehicle. In order to stop product flow, the shear valve must be located in the supply line at the inlet of the dispenser.

Figure 12.10: Proper shear valve placement

The valve must be properly anchored and installed at the correct height (usually at grade). Figure 12.10 shows a shear valve that has been properly anchored. You should have your shear valve inspected yearly.

Shear valves must not be modified or tampered with to keep them open. Figure 12.11 and Figure 12.12 show shear valves that have been tampered with to keep them open. These valves would not perform as intended in a collision, and would fail a DEC inspection.

Figure 12.11: Retrofitted shear valve. This defeats the safety purpose of the valve and would fail a DEC inspection.

Figure 12.12: Shear valve held open with a socket wrench and zip tie. This, like the shear valve in the previous figure, is a major fire and environmental hazard, and would fail a DEC inspection.

Figure 12.13 and Figure 12.14 illustrate the difference between a non-working shear valve and a working one. In Figure 12.13 the shear valve failed to close properly during a vehicle collision. Therefore, product continued to flow. The result was a damaging fire and costly clean up.

Figure 12.14 illustrates a vehicle collision where the shear valve closed properly. Product flow therefore stopped, and no fire occurred.

Figure 12.13: Accident where the shear valve failed to shut off fuel flow.

Figure 12.14: Accident where the shear valve properly shut off fuel flow.

Check Valves

A piping system is considered a "safe suction" system if it satisfies ALL of the following criteria:

- The piping operates at less than atmospheric pressure (i.e., under suction);
- it has a check valve at the bottom of the dispenser;
- there is no other check valve on the suction piping; AND
- the piping slopes down to the tank.

Safe suction systems - also known as European suction systems - are defined by the placement of the check valve (see Figure 12.15). The purpose of the check valve is twofold. First, the check valve keeps product flowing in one direction by preventing backflow. Second, if the piping in a safe suction system springs a leak, most of the product will likely flow back into the tank instead of through the leak into surrounding soil. If a suction system satisfies the criteria above, it does NOT require leak detection. You must be able to show that your safe suction system has only one check valve, and that the valve is properly located. However, it can be difficult to identify in-line check valves. If you do not have documentation of your check valve location, a service contractor may be able to investigate your system and provide a written report that documents the valve for your records.

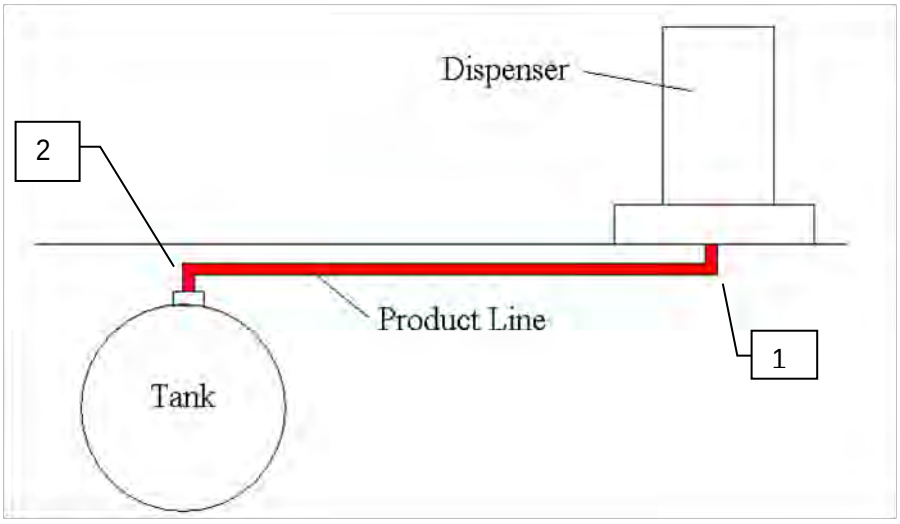


Figure 12.15 Diagram showing location of check valves for (1) European (safe) and (2) American suction system (Source: DEC)

Some suction systems have a check valve located at the tank, either near the top of the tank or at the bottom of the suction line in the tank. This type of system is called an "American suction" system. If the piping in this system leaks, the product in the piping will be blocked by the check valve and will not drain back into the tank. Instead, the product will be released into the environment. Therefore, this type of system requires leak detection (see Chapter 10).

If product is delivered to your tank using a pump (e.g. the on-board pump of a fuel delivery truck), and if the fill pipe is arranged such that product could flow back out of your tank through the fill pipe, then you MUST have a check valve on the fill pipe to prevent backflow.

Solenoid Valves

Gravity head systems are fuel systems where the UST sits at a higher elevation than the fuel dispenser. You may see this type of system, for example, at many marinas (see Figure 12.16). If the dispenser or hose has a leak, gravity can cause product to flow from the tank (up high) and out the leak (down low). The product can keep flowing until the tank is empty, creating a large spill at your facility. To prevent this type of spill you MUST install a solenoid valve, an anti-siphon valve, or similar device, to keep the pipe closed off when you are not dispensing fuel. The solenoid must be installed adjacent to and downstream of the tank's operating valve (usually in the tank top sump). A solenoid valve that meets NFPA 30A satisfies these requirements.

Your tanks must have operating valves to control the flow of product through tank connections

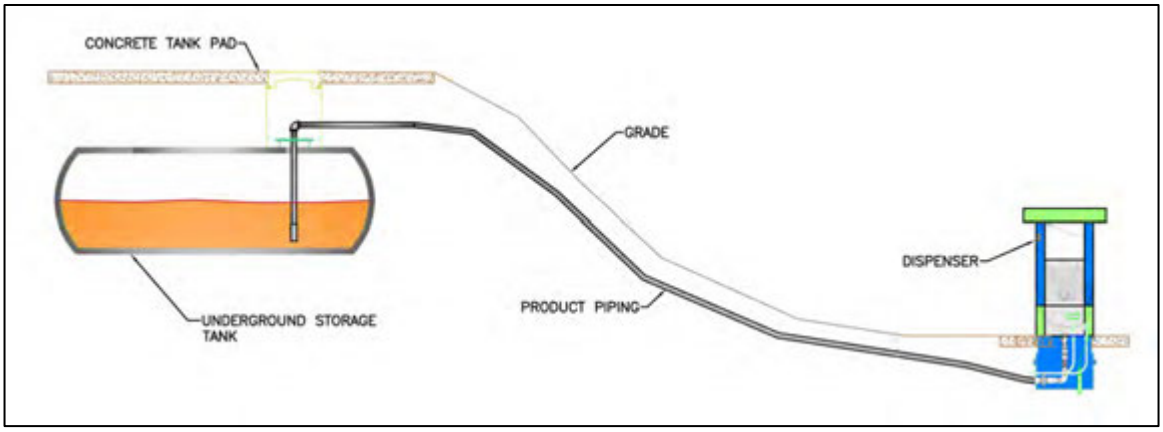


Figure 12.16: Typical gravity head system layout

Operating Valves

Your tanks must have operating valves to control the flow of product through tank connections, so that product flow can be stopped in situations such as maintenance, repair, or emergencies. An operating valve that meets NFPA 30 standards meets this requirement.

Breakaway Valves

The breakaway is located on your dispensing hose. The purpose of a breakaway is to prevent spills if a customer drives off with the nozzle still in their fuel tank. The breakaway will "break" and snap the hose shut to prevent product from escaping from the dispenser. The break occurs at the breakaway instead of shearing the hose open. Some breakaways are designed so that you can reconnect the hose. Other kinds must be replaced before you can use the hose again. In either case, you should look over the interior and exterior of the dispenser to make sure the dispenser or shear valve wasn't damaged during the incident.

Figure 12.17: Breakaway valve

12.4 Accidents

If a vehicle impacts your dispenser you should inspect your dispenser thoroughly before you continue to use it. You should do an inspection even if there appears to be no damage done.

Open your dispenser and verify the piping was not cracked or damaged during the collision. Also, make sure your shear valve was not damaged. Call a service contractor for assistance if you have any safety concerns about performing an inspection yourself.

Figure 12.18 Be sure to check your shear valve after an accident such as a vehicle hitting a pump

12.5 Calibration

All dispensers should be calibrated to properly record the amount of product you are dispensing. Proper calibration will help insure that your inventory and other records are correct.

Retail facilities must display a current Bureau of Weights and Measures seal (or Bureau of Consumer Affairs seal in New York City). Calibration is not required for non-retail dispensers but it can help you keep your inventory reports accurate and detect potential loss or theft of product.

12.6 Summary

- Understanding the components of your dispenser and performing proper maintenance can help you prevent leaks into the environment.
- Inspection and maintenance of dispensers is your responsibility. You should visually inspect your dispensing equipment daily to ensure it is working properly and leak-free.
- Suction and pressurized systems must meet different regulatory requirements, so it is important to know which type of system you have.
- Make sure you have a key to your dispenser cabinet available at all times for maintenance and periodic inspection.
- Buried steel piping connected to the dispenser must be protected from corrosion.
- UDCs are required for all new dispensers. UDCs MUST be liquid tight on all sides, on the bottom, and at any penetrations. In addition, UDCs must allow for visual inspection and access to the components contained within the UDC.

- Every dispenser that is part of a pressurized piping system must be equipped with a shear valve, also known as a crash valve or impact valve. Be sure the valve is properly anchored and is installed at the correct height. Shear valves must not be modified or tampered with.
- If you have a safe suction system, you must be able to show that it has only one check valve and that the valve is properly located.
- If product can flow by gravity from your tank to your dispenser, then you must install a solenoid valve or similar device, to keep the pipe closed off when you are not dispensing fuel.
- Your tanks must have operating valves to control the flow of product through tank connections, so that product flow can be stopped in situations such as maintenance, repair, or emergencies.
- If product is delivered to your tank using a pump (e.g. the on-board pump of a fuel delivery truck), and if the fill pipe is arranged such that product could flow back out of your tank through the fill pipe, then you must have a check valve on the fill pipe to prevent backflow.
- If a vehicle impacts your dispenser or breaks the hose, you should inspect your dispenser thoroughly before resuming use of the dispenser in order to verify that all components, including the shear valve, are in proper working condition.
- All dispensers should be calibrated to properly record the amount of product you are dispensing.

13.0 Spill Prevention and fill ports

Spill prevention devices are used at fill ports to prevent small drips or spills from entering the environment. The most common spill prevention device is a spill bucket. A spill bucket is a liquid tight container that surrounds the fill port and is designed to catch small leaks, drips or spills from the delivery hose that may occur during a delivery. Spill buckets are commonly located underground within the tank pad.

Note: Spill buckets are also sometimes called "catch basins". Do not confuse them with the "catch basins" that drain to storm sewers.

Figure 13.1: Fill hose connected to fill port inside a spill

Figure 13.2: Fill port inside spill bucket

Figure 13.3 Dirty spill bucket in need of cleaning

Spill Containment Requirements
6 NYCRR 613-2.2 (a)

- Ensure that releases do NOT occur
- Report and investigate all spills
- Label fill ports
- Color code fill ports

13.1 Maintenance

It is YOUR responsibility to keep spill buckets CLEAN and DRY at all times. Any water or fuel left in your spill bucket may damage the spill bucket over time, causing the bucket to rust or rot and potentially leak product into the environment.

Figure: 13.4 Spill bucket and hand pump.

Spill bucket and their lids/plow rings should also be inspected to ensure they create a water tight seal. Any chips or cracks in the lid or plow ring will allow water to enter the spill bucket. Cracks or holes in the spill bucket will allow water or fuel to leak out. Damaged spill buckets must be replaced.

Most spill buckets are equipped with a drain valve. The drain valve is located at the bottom of the bucket and when used, drains any liquid contained in the spill bucket into the tank. Fuel in a clean bucket can be returned to the tank by opening the drain valve.

If your spill bucket contains water or a fuel/water mixture, the liquid must be disposed of properly. Contact your UST service provider for assistance in disposing this waste.

Many spill buckets either do not have a drain valve or have a valve that has been plugged to prevent water from draining into the tank. When the spill bucket does not have a functional drain valve, the operator must have a method to remove the liquid from the spill bucket. This is often done using a hand pump.

Double-walled spill containment buckets can also be installed. These buckets are easily replaced and may be equipped with a mechanical or electronic gauge to monitor the interstitial space between the spill bucket and the containment bucket.

Figure: 13.5 Double-walled spill bucket

Spill buckets must be properly maintained.

13.3 Common Issues

Figure 13.6: Damaged spill bucket

It is important to be aware of some common issues related to spill buckets and to address them immediately:

Spill bucket contains liquid:

- Clean spill bucket before and after delivery
- Any product remaining more than 2 hours is considered a reportable spill and must be reported to the DEC immediately.

The spill bucket is no longer water tight:

- Inspect the spill buckets for holes or cracks and replace if needed.

Damaged plow ring:

- Repair or replace

Broken caps or gaskets:

- Caps should lock tightly
- Gasket should create a liquid-tight seal
- Repair or replace as needed

If water continues to build up in a spill bucket it needs to be replaced or regraded.

- Contact your service provider to discuss.

Ice in spill bucket:

- Take care to avoid damaging spill bucket when removing the ice.

Tank fill ports must be properly tagged and color coded.

13.4 Tank Tags

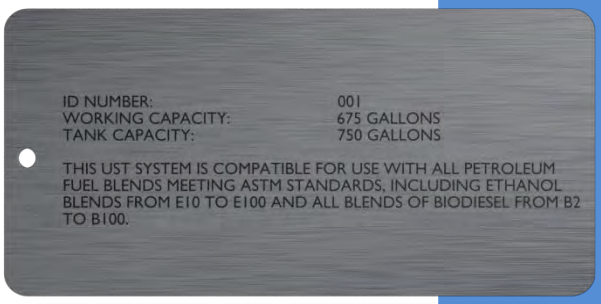


Figure: 13.7 Fill port tag

The fill port on Category 2 and 3 tanks must have a label containing the following:

- registration identification number
- tank design capacity
- tank working capacity
- product that is able to be stored

The tank tag must be visible before any deliveries can be made to your tank. The

label or tag must be permanently fastened to the fill port (i.e. bolted, chained, zip tied). If the tag is not present, contact your service provider to provide a tag with the required information.

13.5 Fill Port Color Coding

Every tank system fill port must be permanently marked and color coded in accordance with API RP 1637. The colors to be used are:

Table 3 Fill Port Color Coding in Accordance with API 1637

Product	Color/symbol
High-grade unleaded gasoline	Red circle w/white cross
Mid-grade unleaded gasoline	Blue circle w/white cross
Low-grade unleaded gasoline	White circle w/black cross
Vapor recovery	Orange circle
Diesel	Yellow hexagon
#1 fuel oil	Purple hexagon w/yellow bar
#2 fuel oil	Green hexagon
Kerosene	Brown hexagon
Used oil / waste oil	Purple square
#4 fuel oil	Green hexagon w/ black or white '4'
#6 fuel oil	Green hexagon w/ black or white '6'
Ultra low sulfur diesel	Yellow hexagon w/ black 'U'
Ultra low sulfur kerosene	Brown hexagon w/ black 'U'
Alcohol-blended fuels	Bronze "home plate" symbol w/ black lettering, e.g., 'E85'
Biodiesel	Bronze hexagon w/ yellow outer band & black or white lettering, e.g., 'B20'
Monitoring well	Black equilateral triangle on white background

A border must be painted around the symbols in the above table for fuel products containing extenders such as alcohol. The border will be black around a white symbol and white around all other colors.

Any monitoring wells located at the facility must be properly identified to prevent accidental delivery of petroleum to the well. Additional protection can be provided by marking the well with a "Do Not Fill" label.

Figure 13.8: Properly colored fill port for unleaded low-grade gasoline (white with black cross) and vapor recovery port (orange circle).

14.0 Spill Reporting and Response

Spills and releases of petroleum from any source at your facility must be addressed immediately. Even small spills can contaminate drinking water supplies, lakes, rivers or streams. Small continuous drips, for example, can add up to a lot of spilled product over time.

There are many potential spill sources from an underground storage tank system. Spill can occur due to tank overfills, customer errors, dispenser leakage, leaking hose or nozzles, piping failure, tank failure, and other causes.

Make sure you are familiar with your system and all of its components so that you are prepared to respond if a spill occurs.

It is your responsibility to identify, report, investigate and respond to spills.

Spill Reporting and Response Actions
6 NYCRR 613-2.4
and Subpart 613-6

- Suspected leaks must be reported within 2 hours
- Suspected leaks MUST be investigated

Spill Response Planning

Your facility should have a spill and emergency response plan in place. The plan should outline what you will do in the event of a spill. Be sure to review the plan with your staff periodically to make sure that they are familiar with their responsibilities. If you don't yet have a spill response plan, NOW is a good time to create one.

Make sure all Class C operators have been trained on leak/spill identification, response, and reporting before they begin work. Their completion of training must be documented and kept in a log for as long as they work at your facility, and a minimum of three years after they leave.

You should have a spill kit on hand to clean up minor spills. These kits are readily available and contain absorbent towels and material. Be sure to properly dispose of any material used to clean up a spill.

Figure 14.1: Keep a spill kit available at all times for minor spill cleanup

14.1 Signs of a Spill or Release

The terms "spill" and "leak" are both defined to mean any escape of petroleum from the container (e.g. the tank, piping, and dispensers) that is ordinarily used for storage, transfer, processing, or use. This definition includes any escape of petroleum into containment (e.g. into a spill bucket, a sump, or the tank interstitial space). A spill that enters the environment is called a "release".

Figure 14.2: Stain from a spill that was not immediately cleaned up

You should always be mindful of the operations at your site. Be alert for any unusual operating conditions, especially those that indicate that something is wrong with the system and that a spill or release could result.

Typical signs of a leak include the following:

- exceedance of the allowable inventory variance;
- tank monitor alarms;
- tank or line test failure;
- slow product flow;
- vapors in your facility or nearby buildings/basements/sewers; and
- presence of product in any location that is not designed to store product.

Figure 14.3: Vehicle that drove off with the fuel nozzle

If you see any signs of a leak or spill, you must take action immediately. Always assume that the sign indicates an actual leak. For instance, if your ATG console is in alarm, don't assume that your leak detection is malfunctioning and that you can ignore the alarm. You must respond to the alarm as a possible spill.

Ignoring signs of a leak or assuming a false alarm may:

- allow the leak to become worse;
- cause harm to people and/or the environment; and
- cost more to clean up.

14.2 Investigating Possible Spills

If there are signs of a spill or leak at your site, do an immediate investigation to determine if you have a situation that needs to be reported to DEC.

To investigate the possible spill or leak, follow the steps below:

- Check the tank top sump, transition sumps and dispenser sumps for product or water.
- Check your inventory records and the math on your inventory monitoring. Did you make a mistake?
- Check your leak detection equipment. Is it operating properly? If not, can it be replaced or repaired immediately?
- Look around your site for other signs of a leak or spill.

If you determine you may have a leak, take action:

- Identify fire, explosion, and vapor hazards.
- Take appropriate safety measures.
- Stop the leak and contain any releases if feasible and safe to do so.
- Report the leak.
- Discontinue use of the system/activate the emergency stop.
- If necessary, call a service provider to investigate the leak.
- Test the tank and/or piping.
- Empty the tank if necessary.

To report the leak:

- Notify the Class A and Class B Operators.
- Notify DEC.
- Notify your local fire department, if needed.
- Call designated staff within your company who can help you with spill response (i.e. corporate safety officer or manager).

Any product found where it **shouldn't be is** considered a spill

14.3 Reporting Spills and Releases

Any product found where it shouldn't be is considered a spill. This includes, but is not limited to:

- product in the tank top sump, dispenser sump or transition sump;
- accidental overfills during deliveries; and
- spills by consumers filling their tanks.

You must report spills to DEC within 2 HOURS of discovery.

THE DEC SPILL HOTLINE NUMBER IS 1-800-457-7362

(518-457-7362 outside New York State)

A spill MUST be reported unless ALL of the following are true:

- the spill is less than 5 gallons in total volume, *and*
- is contained and under control, *and*
- has not reached and will not reach the State's waters (including groundwater), or any land, *and*
- is cleaned up within two hours after discovery.

Some examples:

- If a quart of fuel is spilled into the spill bucket during a delivery, but none is spilled outside the spill bucket and all the fuel is cleaned up immediately, then the spill is not reportable.
- If five gallons or more are spilled into the spill bucket, OR if any of the fuel is spilled to soil, OR if it takes longer than two hours to clean up all the fuel, then the spill MUST be reported.
- If you are excavating during the removal/replacement of a tank, or for any other reason, and find petroleum staining in the soils or sheens on the groundwater, this MUST be reported.

You must report releases of petroleum outside of the tank system such as free product or vapors in soil, basements, utility lines, sewers or nearby surface water within 2 hours after discovery.

NEVER ignore leak detection alarms

You must report the following conditions within 2 hours after discovery unless they were NOT caused by an actual reportable spill AND any equipment found to be defective is IMMEDIATELY repaired or replaced:

- Monitoring results, including alarms, which indicate a possible leak.
- Unusual operating conditions:
  - Erratic behavior of dispensing equipment
  - Sudden loss of product from the tank system
  - Unexplained presence of water in the tank
  - Liquid (water/petroleum) in the dry interstitial space of the tank or any secondarily contained system
  - Liquid (water/petroleum) in the piping containment sump
  - Product in the spill bucket
  - Loss or gain of fluid in wet interstitial space
  - Leak alarms
  - Failed ATG test
  - Failed tank tightness test
  - Suction dispenser loses suction
  - Any other conditions that indicate a leak or possible leak

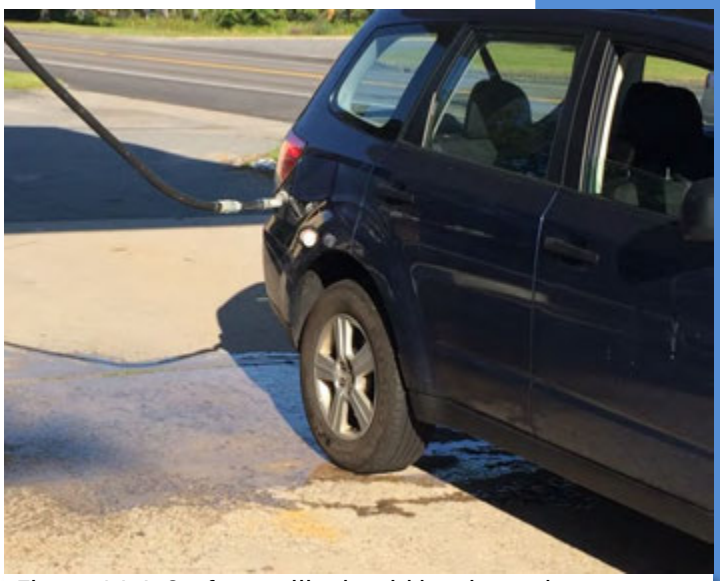


Figure 14.4: Surface spills should be cleaned up immediately. Petroleum can travel a long way in a short time.

You must report within 48 hours any indications of a leak based on:

- statistical inventory reconciliation (SIR) (see Chapter 9); or
- ten-day inventory reconciliation (see Chapter 8).

Once you discover a spill you must contain the spill and begin corrective action as detailed in rest of this chapter.

You must immediately discontinue the operation of any leaking UST system and take the system out of service, or permanently close the UST system. It is important to clean up a spill as soon as possible to mitigate the risk to people and the environment.

14.4 Minor Spill Response Actions

If a minor spill occurs at your site you may be able to clean up the spill yourself. But you should only attempt to clean up the spill IF you can do so safely.

Call 911 and/or contact a spill contractor if you do not feel that you can clean up the spill on your own. You should reach out to a spill contractor NOW to determine their availability and pricing in preparation for a spill that needs professional assistance.

Figure 14.5: Workers cleaning up a spill with "Speedi-dri" and absorbent pads

Figure 14.5 shows workers cleaning up a spill with "Speedi-dri" and absorbent pads. "Speedi-dri" and other similar products are similar to cat litter and will soak up spilled petroleum. However, these products will not absorb any oil if they become saturated with rain or if they otherwise become wet.

Petroleum-specific absorbent pads will only soak up petroleum. They repel water and can be used to soak up spills even if it is raining or the spill occurs in a wet area.

Use "Speedi-dri" or absorbent pads to soak up as much of the spill as possible. Never leave fuel-soaked materials lying around, since they are a fire hazard. Fuel-contaminated soils and fuel-soaked materials must be disposed of properly. Due to the potential presence of fuel, the disposal of these materials may need to be treated as a regulated or hazardous waste. The operator should be:

- familiar with applicable waste disposal laws and regulations; and
- able to determine when spill clean-up wastes require disposal as a regulated or hazardous waste.

THE OPERATOR IS RESPONSIBLE FOR PROPER DISPOSAL OF CLEAN-UP MATERIALS.

Never use a garden hose to clean up any spills. The water will wash product into the soil and/or storm sewer system or nearby water bodies and will contaminate an even larger area.

Figure 14.6: Your spill kit should contain absorbent pads or Speedi-dri which can be used to clean up minor spills

14.5 Release Response, Investigation, and Corrective Action

For spill or leaks without an obvious cause or that cannot be quickly contained and cleaned up, your response must include: an initial response; leak investigation and/or site check; initial abatement; site characterization; free product removal; and corrective action.

Leak investigations must start within 48 hours of reporting a suspected leak.

Initial Response

First: perform the safety, reporting, and action steps listed in Sections 14.2 and 14.3. Then, unless you can completely contain and clean up the spill using the steps in section 14.4, you must complete the measures below, or other measures as directed by DEC.

Leak Investigation: System Tightness Test and Site Check

You must conduct a leak investigation that meets the requirements of 6 NYCRR 613.-2.4(c) if

1. you suspect a leak at your facility, OR
2. your tank system may be the source of impacts that are observed by (or reported to) DEC on a nearby property.

Signs of environmental contamination on another property include conditions such as the presence of free product or vapors in any of the following:

- soil,
- basements,
- sewers,
- utility lines,
- nearby surface water, or
- drinking water.

Figure 14.7: Technician performing a tank test

If a leak or spill is suspected on your site or another property, you must begin an investigation within 48 hours and complete it within 7 days.

If evidence of a leak is not based on environmental contamination (e.g. equipment-based alarms or leak monitoring results), then you must do a tightness test on your tank system.

For a tightness test to be valid it must:

- be capable of detecting a leak from a tank system at 0.1 gallons per hour;
- have a probability of detection of at least 95% and probability of false alarm of no more than 5%; and

- be performed by a person who has been trained and certified or credentialed by the manufacturer/vendor of the test method.

If the results of the tightness test do not indicate a leak and there is no evidence of environmental contamination, then no further investigation is required.

If the tightness test confirms a leak, you must conduct a site check as described below. A site check must also be performed if the results of the tightness test do not indicate a tank leak but environmental contamination is the basis of the leak investigation.

A site check requires the facility to measure for the presence of a release where contamination is most likely to be present. You must consider the location, methods of storage and type of petroleum stored to be sure the investigation can identify the source of the release.

As an example, some sites may have existing monitoring wells on site. These wells could be used to measure for contamination as long as the release is likely to be discovered through those wells. Facilities may need to install monitoring wells or excavate the subsurface to determine if the tank system is leaking.

If the site check does not reveal a release, further investigation is not required. Be certain to document any investigation and the results of the investigation.

If the site check does reveal a release, the DEC must be notified within 2 hours after the discovery.

A corrective action may be required if a release has occurred. Steps to develop and implement a corrective action plan include: initial abatement, site characterization, free product removal, investigations for clean-up, and plan development/implementation.

Initial Abatement Measures (613-6.3)

Once a release is confirmed, you must perform the following initial abatement measures, unless directed otherwise by DEC.

1. Remove as much of the petroleum from the tank system as necessary to prevent further release.
2. Visually inspect aboveground releases or exposed below-ground releases and prevent further petroleum migration.
3. Continue to monitor any fire or safety hazards posed by vapors or product that have migrated from the excavation zone.

Respond immediately to spills or leaks.

Identify and mitigate any fire or explosion hazards during your initial spill response.

Prevent release of additional product.

4. Remedy hazards posed by contaminated soils that are excavated or exposed during response, investigation, or corrective action.

5. Complete a site check, as described above, unless the location of the release has already been determined.

6. Investigate to determine the amount of free product that has been released and begin free product removal as soon as possible (see "Free Product Removal" below).

Within twenty days after release confirmation, you must submit a report to the DEC summarizing the initial abatement steps you have taken as well as any resulting information/data.

All free product removal must be conducted according to the standards outlined in the PBS regulations.

Initial Site Characterization

Unless otherwise directed by DEC, you must perform an initial site characterization by gathering required information about the site and the nature of the release. You must include information gained during the initial abatement and site check. Required information includes all of the following:

- the nature and estimated quantity of the release;
- data from available sources and/or site investigations concerning:
  - the surrounding populations
  - water quality
  - use and approximate locations of wells potentially affected by the release
  - subsurface soil conditions
  - locations of subsurface sewers
  - climatological conditions
  - land use;
- results of the site check; and
- results of the free product investigations (see below).

The above information must be submitted to DEC within 45 days after the release is confirmed or another reasonable period of time determined by DEC.

Free Product Removal (613-6.5)

If you discover free product during your site check, it must be cleaned up. You may contact a local spill clean-up consultant to complete the free product removal for you.

You should establish an agreement with a local spill clean-up contractor before you ever experience a spill. Develop an understanding of their pricing and availability if you were to require their assistance.

All free product removal must be conducted according to the standards outlined in the PBS regulations.

Unless otherwise directed by DEC, within 45 days after confirming a release you must prepare and submit a free product removal report that contains at least the following:

- Name of the person(s) responsible for the clean-up measures;
- Estimated quantity; type and thickness of free product observed or measured;
- Type of free product the system used;
- Whether any discharge will occur during clean-up (and where);
- Type of treatment applied to the clean-up as well as the resulting effluent quality;
- The steps being taken to obtain necessary permits for any discharge; and
- Disposition of the free product.

Investigations for Soil and Groundwater Clean-Up

You must conduct soil/groundwater investigations of the release, your site, and surrounding areas that may be affected if:

- you find free product on your site; OR
- there is evidence that a release at your site may affect surface water or groundwater; OR
- DEC requests an investigation, based on potential impacts to surface water or groundwater.

The investigations must determine the full extent and location of soils contaminated by the release and the concentrations of dissolved product in the groundwater. These investigations must be conducted according to the guidelines presented in the PBS regulations. You will likely need to hire a contractor to complete the investigations.

The facility must present the information to DEC as soon as practicable or in accordance with a schedule established by DEC.

14.6 Corrective Action Plan

At any point during your spill response and investigations, DEC may require you to submit additional information. You may also be required to develop and submit a corrective action plan for responding to contaminated soils and groundwater.

Your plan must provide adequate protection for public health and the environment and must address the factors listed in the regulations. You must modify your plan as required to provide this protection. Once DEC approves your plan, you are responsible for implementing, monitoring, evaluating, and reporting the results according to the schedule and format established by DEC.

14.7 Public Participation

If a release from your facility requires a corrective action plan, DEC will require an opportunity for public involvement by anyone who may be affected by the spill or the corrective action. Notice of the opportunity may include public notices in local newspapers, block advertisements, public service announcements, e-mail, publication in a state register, letters to individual households, or personal contacts by field staff.

DEC will ensure that site release information and decisions about corrective action will be available to the public upon request.

Before approving a corrective action plan DEC may hold a public meeting to consider comments on the proposed corrective action plan. Public notice will be required if the corrective action plan fails to achieve its clean-up goals and DEC is considering termination of the plan.

Spill clean-up plans may be disclosed to the public.

14.8 Recordkeeping

The following records regarding spills or leaks must be maintained for at least 3 years:

- Your ten-day inventory reconciliation sheets;
- Results of any sampling, testing or monitoring (for tanks and piping);
- Written documentation for all calibration, maintenance and repair of leak detection equipment;
- Manufacturer's schedules for calibration and maintenance of leak detection equipment following installation;
- Calibration, maintenance and repair records for all leak detection equipment that is permanently located on site;
- Schedule of required calibration and maintenance provided by the leak detection manufacturer after installation; and

- Tank closure records.

Line or tank tightness testing results must be maintained until the next test is conducted, while the LLD operability test records must be maintained for three years. In addition, you must make the last 30 days of weekly leak monitoring available to DEC at the time of request.

You should keep all leak detection results in some type of log book. The book should be easily accessible and available at all times.

Note: Many ATG systems use thermal printer paper to print test results and sensor status. This paper can fade over time and the necessary records may not be available. Along with maintaining copies of ATG print-outs, consider creating a written log with leak detection results, or create longer lasting copies by photocopying or scanning the print-outs.

The last 30 days of leak monitoring results MUST be available to DEC at the time of request.

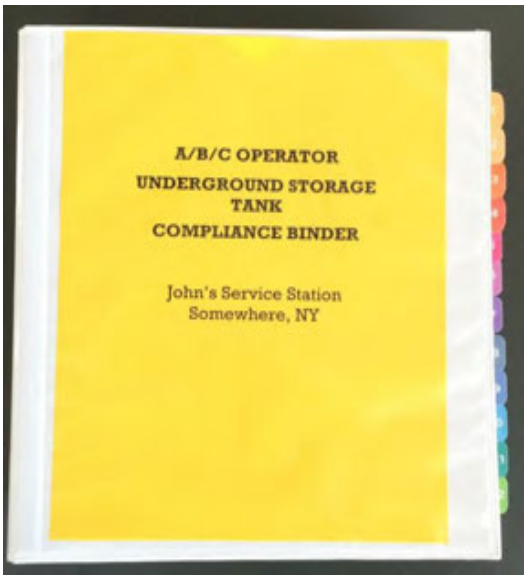


Figure 14.8: Keep all spill or leak detection documentation in a log book

14.9 Summary

- It is your responsibility to identify, report, investigate and respond to spills.
- Any product found where it shouldn't be is considered a spill.
- Spills and releases from any source at your facility must be addressed immediately.

- You must report spills to the DEC Spill Hotline within 2 HOURS after discovery.
- Make sure you are familiar with your system and all of its components so that you will be prepared to respond if a spill occurs.
- Your facility should have a spill and emergency response plan in place. The plan should outline what you will do in the event of a spill.
- Make sure all Class C Operators have been trained on leak/spill identification, response, and reporting before they begin work.
- Be alert for any unusual operating conditions. An unusual operating condition may indicate that something is wrong with the system and that a spill or release could result.
- For spill or leaks without an obvious cause or that cannot be quickly contained and cleaned up, you may be required to conduct some or all of these actions: leak investigation and/or site check; initial abatement; site characterization; free product removal; investigations for clean-up; and corrective action.
- If a release from your facility requires a corrective action plan, DEC will require an opportunity for public involvement by anyone who may be affected by the spill or the corrective action.
- Most records regarding spills or leaks must be maintained for at least 3 years.

15.0 UST System Recordkeeping

Incomplete or missing paperwork is one of the most frequent causes of regulatory citations. Keeping your UST system records in order is important so you can demonstrate to an inspector that you are in compliance with the PBS regulations. Organized records will help your inspection go smoothly and will help you - and the inspector - determine whether your system is in compliance.

The person keeping your records should know what records need to be kept and should keep them up-to-date and in a neat, well-organized manner. A 3-ring binder with divider tabs is a good way to organize UST system information so that it can be easily located when needed.

Operators must make records available to DEC within three business days after a request by DEC. However, the results of leak detection monitoring for the past thirty days MUST be made available to DEC at the time of the request.

The operator, facility owner or tank system owner must allow a designated employee or agent of DEC to review and copy any requested books, paper, documents or records related to PBS compliance. Any designated employee or agent of DEC may enter and inspect a facility to ensure compliance.

UST System Record-keeping
6 NYCRR 613-1.5

- Keep organized records of your UST system
- All records should be available to DEC at the time of the request.

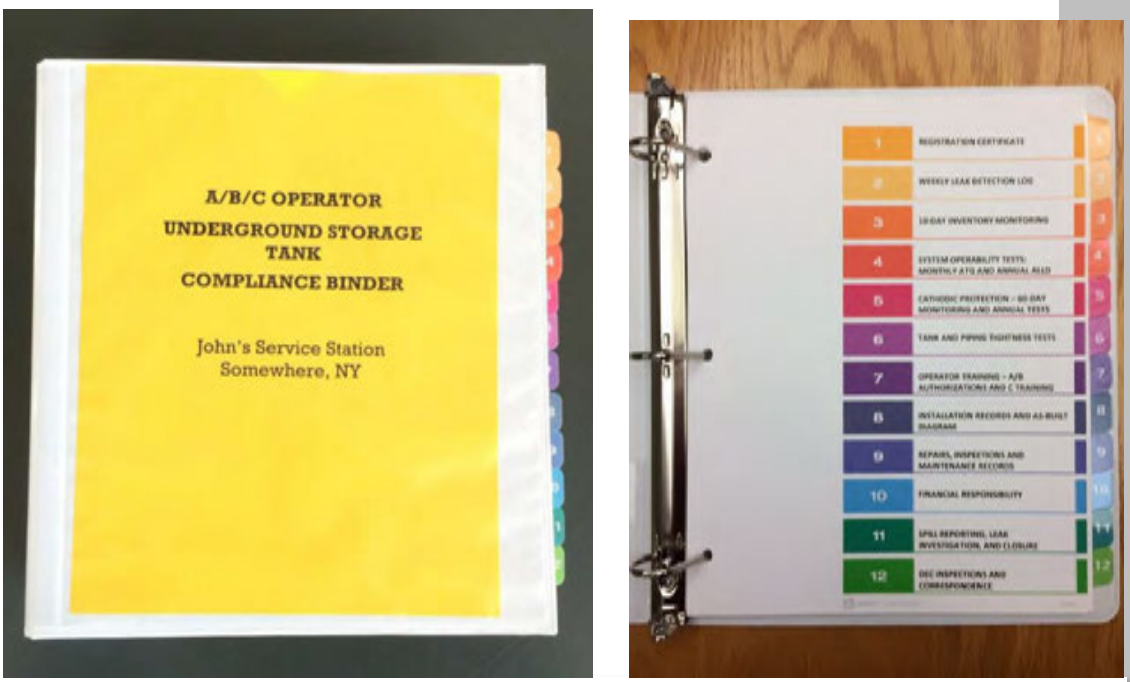


Figure 15.1: An organized compliance binder will make inspections go much more smoothly

15.1 Record Storage

The following are tips to keep your records organized:

- Keep records organized in a 3-ring binder or similar file organizer.
- Create a table of contents for your binder. Figure 15.2 shows a sample Table of Contents for a compliance binder. Note: This is an example only - not every site will need the same table of contents. Be sure you have the correct documents for your site in your binder.
- Keep all logs in your compliance binder organized and legible. ATG consoles often print on thermal paper that will fade over time, similar to retail receipts. You should transfer inventory reports printed on thermal paper to a computerized spreadsheet or handwritten inventory form so that they remain legible.
- Insert documents into your compliance binder right away so that they will not get lost or ruined. You may find it easiest to keep documents in your compliance binder in page protectors, so that documents do not need to be hole punched and can be inserted directly into the binder.
- Make sure that your record keeper maintains the binder in a neat and organized manner and keeps records up-to-date. Make sure they know what records need to be kept and for how long.

Figure 15.2: Sample table of contents for a compliance binder

15.2 Record Accessibility

Records must always be accessible to DEC.

- Operators MUST know where the information is located.
- Records should be located where operators can easily access them.
- Any records not available at the time of DEC's request MUST be provided to DEC within three business days.
- If you have permanently closed any tanks or changed their service (e.g. switched to an unregulated product) within the last three years, then you must keep records that document compliance with closure requirements, including a site assessment, if required. Copies of those records must also be transmitted to DEC within ninety days after the tank is physically closed or changes service.

Figure 15.3: Organized compliance binders make inspections easier

Note: The last 30 days of leak detection documentation MUST made be available to DEC at the time of request. If an inspector asks for this documentation, you must be able to produce it immediately.

15.3 Required Records

Table 15.1 lists the records your facility is required to keep and how long they must be kept. The records should be kept in a compliance binder or otherwise organized so that they are neat and easily accessible.

Figure 15.4: Create a binder with a colorful cover and spine to make it easy to find

Table 15.1: Required Records

Record	*Timeframe the record must be retained*
Operator Training (Chapter 2)	
Operator Training	For as long as the Class A, Class B, and Class C operators are designated AND for an additional 3 years
Tank Registration (Chapter 4)	
Registration Certificate	5 years from date issued
Financial Responsibility (Chapter 5)	
Financial Responsibility	Life of tank system
Tank Closure (Chapter 6)	
Closure Record	Forward copies of the permanent closure record(s) with the site assessment to DEC within 90 days after closure; keep originals of both records for at least 3 years (recommended to keep as permanent record)
Site Assessment	
10-day Inventory Monitoring (Chapter 8)	
Daily Readings	3 years
Reconciliations	3 years
Tank Leak Detection (Chapter 9)	
Tank Tightness Testing	Until next test is conducted
Weekly Monitoring	3 years
Leak Detection Repair	3 years after the repair
Piping Leak Detection (Chapter 10)	
Line Tightness Testing	Until next test is conducted
Weekly Monitoring	3 years
Annual Line Leak Detector Operability Test	3 years
Leak Detection Repair	3 years after the repair

Record	*Timeframe the record must be retained*
Cathodic Protection (Chapter 11)	
60-Day Rectifier Readings (impressed current system only)	3 years
Annual Cathodic Protection System Test	3 years
Spill Reporting (Chapter 14)	
Reporting of Suspected Leaks	3 years
Equipment Compatibility (Chapter 17)	
Compatibility	No records required
General System Records	
Installation Records (i.e. as-built diagrams, manufacturer details)	Life of tank system
Lining Inspection	5 years
Repairs	Life of tank system

15.4 Summary

- Incomplete or missing paperwork is one of the most frequent causes of regulatory notices of violation (NOVs).
- Keeping your UST system records in order is important so you can demonstrate to an inspector that you are in compliance with the PBS regulations.
- The person keeping records should know what records need to be kept and should keep them up-to-date and in a neat, well-organized manner. A 3-ring binder with divider tabs is a good way to organize UST system information so that it can be easily located when needed.
- Operators must make records available to DEC within three business days following a request by DEC. However, the results of leak detection monitoring for the past thirty days MUST be made available to DEC at the time of request.

16.0 Operation and Maintenance

It is important to follow the proper operating procedures and maintain your tank system to prevent spills and leaks. Know the components and operating requirements of your tank system. Record your required inspection observations and test results.

Establish a regular routine to inspect and maintain your tank system. Consider setting a calendar reminder or assigning the task of inspecting and recording information to an employee to help you meet required deadlines.

Operation and Maintenance

EPA Grant Guidelines, Solid Waste Disposal Act Section 9010(a)

- Understand how your UST system works to prevent spills.
- Maintain the various components of your UST system to ensure proper operation.

16.1 Day to Day Operations - What Do I Need To Do?

The activities in this section should be performed every day to ensure that your tank system is operating properly.

Complete inventory and reconciliation

Ten-day inventory reconciliation is required at certain sites and is a good management practice for other sites with metered tanks. See Chapter 8 for more information. Daily inventory tasks include:

- Check your entries daily to catch any inconsistencies before you complete your 10-day inventory reconciliation.
- Reconcile your inventory at least every 10 days.
- Investigate variances that exceed the allowable limit as soon as you notice them.
- Report any unexplained variances to DEC within 48 hours following the end of the 10-day inventory reconciliation period.

Measure water in your tank

Water in your tank is a sign that your tank may be leaking.

- The best way to detect water is to measure it with a gauging stick and water-finding paste. Manually sticking your tank for water is a good practice even if your automatic tank gauge is set up to read water levels. See Chapter 8 for more information.

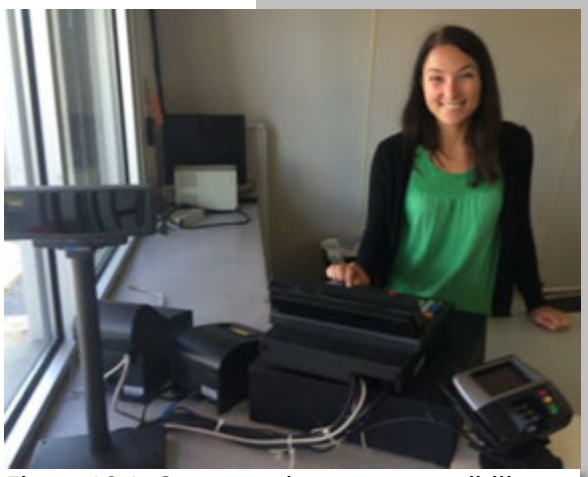


Figure 16.1: Operators have a responsibility to maintain and operate their system according to the PBS regulations

Inspect and clean spill buckets

- Spill buckets should be inspected and cleaned (if necessary) every day. They should be free or water and debris. Ensure that buckets are repaired when necessary to avoid water intrusion and to make sure any spills will be contained. See Chapter 13 for more information.

Look for any spills around the delivery area and dispensing area

- Remember that spill buckets, tank top sumps, and dispenser sumps should be kept free of product at all times.

Inspect leak detection equipment

- Check and respond to any alarms on your ATG. See Chapters 9 and 10 for more information.
- Make sure the leak detection system is powered on and operating.
- Test the overfill alarm.

Be sure your class C Operators are trained for:

- Emergency stop procedures
- Spill response
- Leak detection alarms response
- Contacting A/B operator when required
- Reporting unusual operating conditions
- Making sure that necessary contact numbers are current and readily available
- Knowing the location of compliance binder/record information

Figure 16.2: Accurate inventory monitoring is crucial to preventing leaks from your UST system

Be sure your impressed cathodic protection is on (if present at your site)

- Your rectifier should be on at all times.
- Make sure that the breaker to the rectifier is properly labeled and doesn't get turned off at night.
- Read and record rectifier amperage and voltage every sixty days. See Chapter 11 for more information.

Check your compliance requirements for:

- Annual tank tightness, line tightness and leak detector tests
- Annual cathodic protection testing
- Weekly leak detection inspection

16.2 Inspections

Weekly Leak Detection

Weekly interstitial monitoring is required for all Category 2 and 3 tanks and for newly installed piping or piping connected to Category 3 tanks. Weekly monitoring may also be used for Category 1 tank systems. Many systems are equipped with continuous electronic monitoring systems. Monitoring results from electronic monitoring systems must be documented at least weekly.

- You must keep the last thirty days of leak monitoring results at the facility at all times.
- All leak detection records must be available for three years.
- Records of any maintenance, repairs alarms, calibration or investigations must be available for three years.
- Keep your weekly leak detection reports in a log and be sure it is accessible at all times.
- Systems that conduct continuous monitoring must be set up to print or record weekly results.
- All operators (Classes A, B AND C) should know where to find the leak detection reports.

To properly demonstrate compliance be sure to record all inspections, training and investigations.

Annual Tests

Annual tests that may be required at your site include:

- Automatic line leak detector (LLD) operability test. Remember that pressurized piping (piping connected to a pump in your tank) must be equipped with an automatic LLD. See Chapter 10 for more information.
- Cathodic protection system operability test. This requirement applies to impressed current and galvanic systems. The test must be performed by a qualified cathodic protection tester. See Chapter 11.
- Tank tightness testing. This requirement may apply to Category 1 and 2 tanks in lieu of weekly tank leak detection. See Chapter 9.
- Line tightness testing. This requirement applies to piping connected to Category 1 and 2 tanks if weekly pipe leak detection is not performed. If these tanks have “safe suction”

systems, then tightness testing is only required every three years. Testing must be performed by a certified tester. See Chapter 10.

Note that:

- Cathodic testing reports must be retained for three years.
- Tank and piping tightness test reports must be retained until the next tightness test.
- Test reports must be made available within three days of a request by DEC.
- It is also a good practice to test your shear valves annually.

16.3 Maintenance and Repairs

All of the equipment within your tank system should be properly installed and maintained. Maintenance is essential to prevent spills and to prolong the life of your system.

You must ensure that repairs to your tank system will prevent releases of product due to structural failure or corrosion. Repairs made to your tank system must be conducted in accordance with one of the codes of practice listed in the PBS regulations. In addition, any repairs to your cathodic protection system or leak detection equipment should be completed by certified technicians.

A tightness test may be required after repairs of tanks that do not have weekly leak detection monitoring. A cathodic protection test is required within six months of repairs to a cathodically protected tank system.

Keep good records. If you are conducting the necessary inspections and providing the proper training, be sure these items are recorded and documented. Without records there is no way to demonstrate compliance.

Records from any repairs made to your tank system must be kept until your system is permanently closed or undergoes a change in service. Make sure that these records are accessible at all times.

Records from any repairs made to your tank system must be kept until your system is permanently closed or undergoes a change in service.

16.4 Reminder of Required Ongoing Activities for USTs

Use the checklists provided in this section as a resource to complete the required daily and ongoing activities for your tank system. You should make them part of your regular routine.

Table 16.1: Daily Checklist

Daily Checklist- What to Do Each Day	
Complete inventory reconciliation	
Inspect and clean spill buckets	
Look for any spills around the delivery area	
Inspect leak detection equipment	
Be sure your class C operators are trained	
Verify that your impressed current cathodic protection is on (if applicable:)	
Stick your tank for water	

You should also keep up with the ongoing activities needed to maintain your tank system (see table, next page).

Table 16.2 Required Ongoing Activities

Required Ongoing Activities Keep the proper records for these activities		
Method	Activity	Minimum Frequency
Release Detection		
Inventory monitoring (Ch 8)	Inventory measurements (ATG or manual)	Daily
	Water measurements (ATG or manual)	Daily
	Measure dispensed fuel	Daily
	Measure the amount of fuel delivered	Daily
	Reconcile daily measurements	Every 10 days
	Check variance	Every 10 days
	Check for recurring accumulation of water	Every 10 days
Tank Leak Detection (Ch 9)	Weekly monitoring	Weekly
	Tank tightness testing	Yearly
Piping Leak Detection (Ch 10)	Weekly monitoring	Weekly
	Line tightness testing	Yearly (every 3 years for non-exempt suction systems)
Cathodic Protection		
Impressed Current	Rectifier inspection	Every 60 days
Impressed Current and Galvanic	Cathodic protection test (performed by a qualified cathodic protection tester)	Within 6 months of installation and then annually
		Within 6 months of any repairs and then annually

You should maintain your tank system in accordance with manufacturers' recommendations.

16.5 Summary

- Maintenance is essential to prevent spills and to prolong the life of your system. You should establish a regular routine to inspect and maintain your tank system.
- All of the equipment within your tank system should be properly installed and maintained.
- Repairs made to your tank system must be conducted in accordance with one of the codes of practice listed in the PBS regulations.
- Any repairs to your cathodic protection system or leak detection equipment should be completed by certified technicians.
- Records from any repairs made to your tank system must be kept until your system is permanently closed or undergoes a change in service.

17.0 Tank System Compatibility

Underground storage tanks and piping systems may not be able to safely store all types of petroleum products. With many new blended and alternative fuels on the market, such as ethanol and biodiesel, it is more important than ever to verify that your UST system and components are compatible with the types of product stored at your site. Tank system compatibility can also be a problem when switching between types of product stored.

Product that is not compatible with your system may degrade your tank, piping, seals, gaskets and other components of the equipment and could result in product being released into the environment.

Compatibility
6 NYCRR 613-2.2(c)

- Tanks, piping and all components of your UST system must be compatible with the product stored.

17.1 Definition of Compatibility

All the components of the tank system must be compatible with a stored product. The manufacturer certifies the product compatibility of the tank system components. When product is used with system components that are not compatible, it can cause the tank, piping, or system components to rust, soften, weaken, or otherwise degrade. Some blends of gasoline, such as ethanol blends, are more corrosive than others, and may require special materials or tank linings to prevent the tanks from failing over time.

Because there are so many blends and combinations of products, you must know which products are being delivered to your site. What is the percentage of ethanol or biodiesel? Has the product delivered to your site changed or are the products going to change? Contact your supplier for specific product information.

Figure 17.1: Is your UST system compatible with the product you are storing?

17.2 Why Does Compatibility Matter?

Use of UST system equipment to store incompatible products or blends is not permitted. Using incompatible equipment can cause equipment failure and result in releases into the environment.

Ethanol

Ethanol has a corrosive effect on soft metals such as lead and galvanized zinc. It also has a tendency to deteriorate or dissolve gaskets, alcohol-based glues, sealants, fittings, O-rings, bushings, couplings and boots in your UST system. The components of your UST system were built and designed for a certain level of ethanol in the product. Do not store a higher ethanol blend than your system is designed to store. Also be aware that equipment that is compatible with certain ethanol blends may not be compatible with all other ethanol blends. You should confirm compatibility for your system before adding any blends to your tanks (see Section 17.4, below).

Blends of gasoline, diesel and other petroleum products frequently change.

In addition, system components such as overfill prevention and leak detection may need to be calibrated for the specific ethanol blend you are storing, even if they are otherwise compatible with a range of blend ratios.

Ethanol can also cause problems if water enters your UST system. The ethanol in your fuel system will bond with water. If enough water is present in the fuel, phase separation of the fuel and ethanol/water mixture can occur. The water/ethanol mixture leaves the fuel in the tank without the proper ethanol blend. This reduces the octane of the fuel. Off-specification fuel is illegal to sell and fuel mixed with water can damage vehicle engines.

Small amounts of water can enter your UST system through regular tank operation and maintenance, for instance as a result of condensation of humid air. If enough condensation occurs to cause a measureable accumulation of water in your tank, you may have a serious problem. DO NOT ignore such accumulations, since they are likely to indicate a larger problem that may result in equipment failure or spills.

Accumulated water can circulate through the piping system as well, because product is drawn off the tank bottom, where water accumulates. If fuel is contaminated with water, then the piping system must be flushed out to ensure that all contaminated product is removed. Contaminated fuel and/or water must be properly managed and disposed.

Biodiesel

Like ethanol, biodiesel can degrade tank system components such as hoses, seals, and gaskets. Biodiesel itself is less stable than regular diesel, and tends to break down when exposed to air, water, and metals including copper, brass, bronze, lead, tin, and zinc. Exposure to water can cause microbial growth in the fuel (*bio-fouling*) and make the fuel unfit for use. In addition, water that accumulates in the bottom of the tank can cause metal tanks to rust. You should confirm compatibility for your system before adding any blends to your tanks.

17.3 Types of Equipment Compatibility

All of the equipment in your UST system must be compatible with the type of product stored. This includes:

- tanks;
- tank lining;
- piping;
- line leak detector;
- ATG sensors and probes and floats;
- STP (submersible pump) and components;
- drop tube;
- flexible connectors;
- spill and overfill prevention equipment;
- fill and riser caps;
- dispensers;
- product shear valves;
- hoses and nozzles;
- sealants (including pipe dope and thread sealant), fittings, gaskets, O-rings, bushings, couplings and boots; and
- containment sumps (including tank top sumps and under-dispenser containment)

Figure 17.2: Corroded STP

17.4 Steps to Confirm Compatibility

You are responsible for verifying that your system is compatible with the products you store. To confirm compatibility of your components you may need to do one or more of the following:

- Check that components are independently certified, such as equipment that is listed by Underwriters Laboratory (UL), for use with your product. You should maintain this equipment information onsite (e.g. in your Compliance Binder) or in a readily available location.

- Confirm that you have a manufacturer's written certification of product compatibility that specifies the range of product compatibility.
- Check the manufacturer's installation instructions for your system and components. You should maintain this information in your onsite documentation (e.g. in your Compliance Binder).
- Have your service technician or equipment supplier help determine the model and manufacturer of your fuel system components and/or to help research your equipment compatibility.

The installer or distributor can help you gather the proper information, but you should document compatibility with information specifically from the manufacturer.

See Chapter 20 for links to additional resources.

17.5 When Does Compatibility Matter?

New tank systems should be designed for compatibility with the product to be stored. However, blends of gasoline, diesel and other petroleum products frequently change. Before changing products or introducing a new blend of product to your system, verify that the components of the system are compatible with the product.

Use compatible parts and equipment for repairs or upgrades to your facility. Work with a qualified service technician or engineer to make sure your new parts or components will be compatible with the product stored.

USTs and components MUST be compatible with the type of product stored

17.6 Summary

- Underground storage tanks and piping systems may not be compatible with all types of products.
- Using incompatible equipment can cause equipment failure and result in releases into the environment.
- The components of your gasoline UST system were built and designed for a certain level of ethanol in the product. Do not store a higher ethanol blend than your system is designed to store.
- Use compatible parts and equipment for repairs or upgrades to your facility. Work with a qualified service technician or engineer to make sure your new parts or components will be compatible with the product stored.

- You are responsible for verifying that your system is compatible with the products you store. Confirm tank system compatibility BEFORE storing a new/different product in your UST. You should document compatibility with information from the manufacturer.

18.0 Training of Class C Operators

You should have a trained Class C Operator onsite any time your UST system is operating and an A or B Operator is not present. Class C Operators are individuals who have been trained to take appropriate actions in response to emergencies and alarms caused by spills or releases from the UST system. Typically, these operators are individuals who control or monitor the dispensing or sale of petroleum. They must be trained by a Class A or B Operator BEFORE being designated as Class C Operator. This training can minimize the risks and impacts of petroleum leaks and spills.

Alternatively, the designated Class C operators can be:

- Class A operators who also meet the Class C Operator requirements; or
- Class B Operators (who are considered qualified to be Class C Operators without further training).

The training should include appropriate responses to:

- product spills and releases;
- tank monitoring system alarms;
- fire; and
- other situations that pose an immediate danger to the public or to the environment.

Since there are many types of registered facilities, there is no "one size fits all" plan. Your facility is responsible for developing a site specific emergency spill response plan and for training your Class C Operators. There is little time to think when a spill occurs. Your Class C Operator should understand your facility's plan and be ready to follow it immediately. The plan should describe immediate steps to protect human health and the environment. It should also provide contact information for appropriate emergency personnel, spill responders and Class A and B Operators. See Appendix A for a sample contact information form.

Training C Operators
6 NYCRR 613-2.5(d)(2)

- It is the responsibility of the Class A and B Operators to train all Class C Operators at their site.
- Class C Operators must know what to do in case of an emergency, alarms or spills.

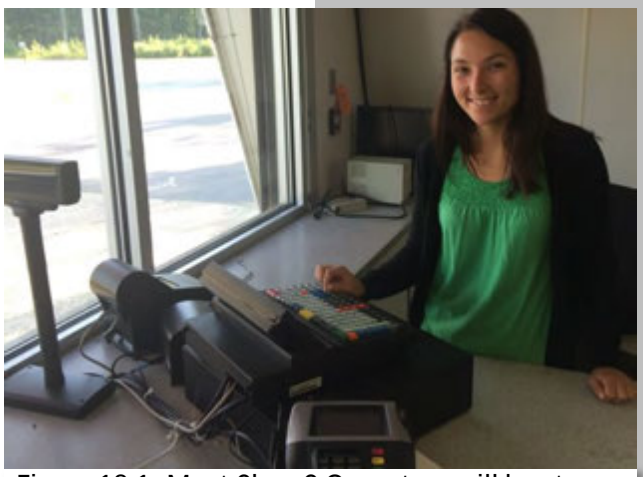


Figure 18.1: Most Class C Operators will be store clerks or the person monitoring fuel dispensing

18.1 Training

Your Class C Operators will be the individuals watching over the UST system when you aren't around. Ask yourself: Will they know what to do in the event of a spill? An emergency? A leak alarm? The proper response to alarms, spills and releases can minimize the risk to people and the environment. Knowing what to do BEFORE an emergency occurs can make all the difference. Class C Operators must be trained before they can be assigned operator duties.

If the training of a Class C Operator is meaningful and comprehensive, the operator will be better equipped to respond and communicate in the event of a spill or emergency. Knowledge of the UST system can help the Class C Operator communicate to responders what is happening at the site. Typically, Class C Operator training should include the following:

1. <u>Basic overview of UST system components:</u>

   A basic overview of the UST system components can help the Class C Operator assist emergency response workers in the event of an emergency.

   Class C Operators should generally know:

   - UST location, size, and type of product;
   - How the tanks are monitored for leaks. If you have an automatic monitoring system, the Class C Operator should know where the control panel is. They should be able to see and hear an alarm and know what to do if the alarm is activated;
   - Location of fire suppression pull station (if present) and when to use it;
   - Location of emergency stop (if present) and when to use it;
   - How breakaway valves work and who to call to reconnect or replace them (if present);
   - Location of spill response supplies and how to use them, or who to call for clean-up; and
   - Location of safety data sheets.

Do NOT neglect Class C Operator training. As a Class A or B or A/B Operator, you will have to rely on your Class C Operators when you are not onsite.

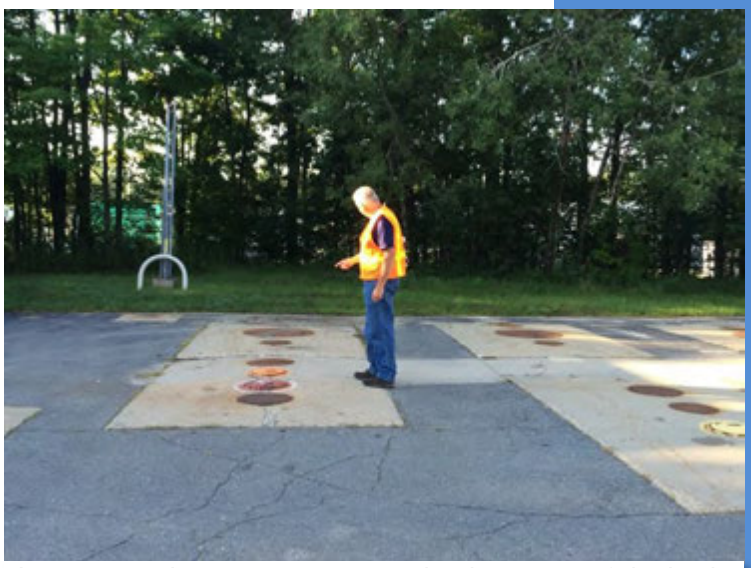


Figure 18.2: Class C operators need to be aware of the basic system components. Class A or B operators should explain the onsite equipment during training.

You may use the information, photos and drawings from Chapter 3 of this Guide in your training program.

When training Class C Operators, take the time to familiarize them with the various tank system components located at your site. It is important for an operator to know what they are seeing

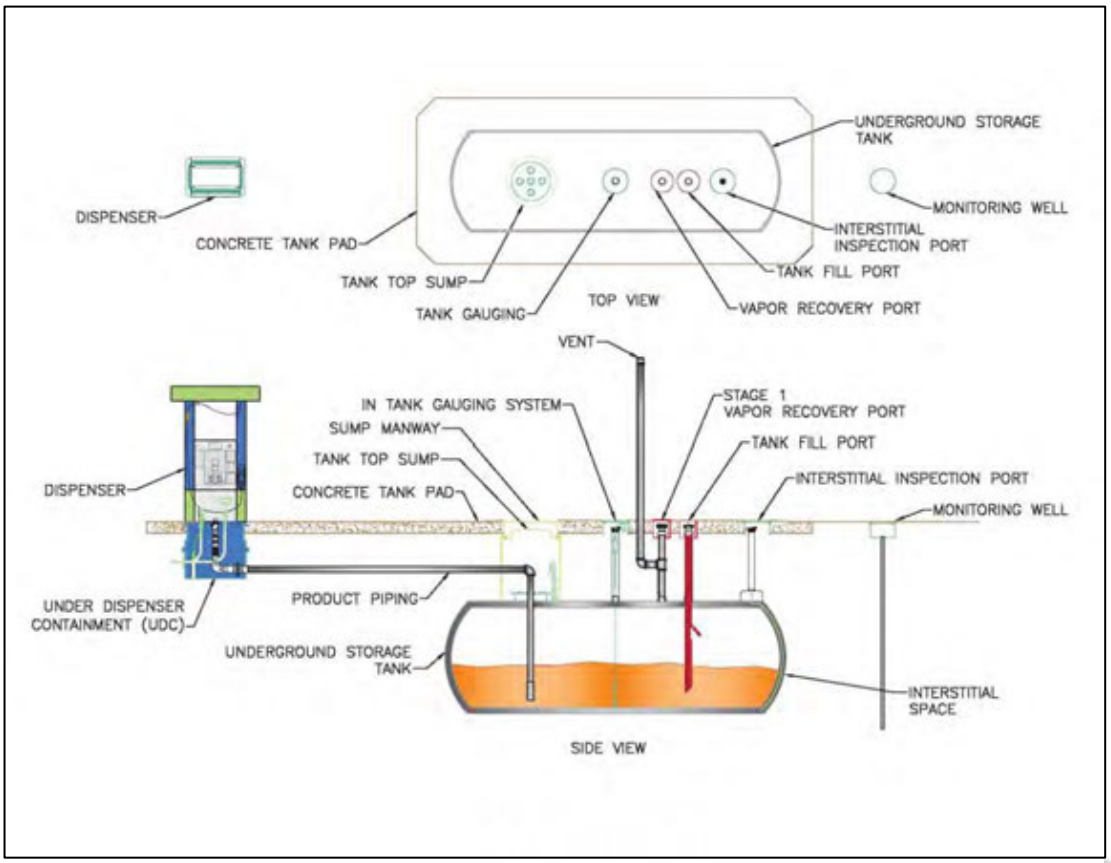


Figure 18.3: Tank top layout and side view. Explain your tank system to your Class C Operator. Walk the operator around your site and show them the basic tank system components.

and what the components do so that they can be better prepared to assist inspectors or emergency responders.

2. <u>Emergency Contact Information:</u>

   Class C Operators need to know whom to contact in the event of an emergency, leak, or spill/release. If they cannot reach the Class A or B Operator, whom should they call next? When should they call emergency responders (911)?

Class C Operators should have an understanding of your UST system to better respond during emergencies.

Class C Operators should have an emergency contact list posted and accessible.

- Provide your Class C Operators with a contact list. This list should include names, job titles, phone numbers and whom to contact first, second and so on.
- Make sure your Class C Operators know whom to contact and when. In an emergency, if they cannot reach a Class A or B Operator they need to keep making calls until they reach a responsible individual. Waiting "until tomorrow" or just leaving a message with someone is NOT an adequate response.

3. <u>How to respond to spills or emergencies:</u>

Spills or leaks can happen at any time, not just while the Class A or B Operator is onsite. You need to feel confident your Class C Operator is trained to respond to emergencies correctly when you are not there to direct them.

Information you should consider including in your C Operator training includes how to:

- recognize spills, leaks, and emergency situations;
- recognize leak alarms;
- isolate spills and keep people away;
- stop the flow of product if possible (many sites have an emergency stop for this purpose);
- activate the fire suppression system if appropriate;
- contact the Class A or B Operator;
- know when to contact emergency responders (911); and
- locate and use the spill clean-up kit, and/or contact the appropriate clean-up responder.

Figure 18.4: Spill kit. Do you have one of these at your site? Do your employees know where to find it?

Class C Operators may be trained on how to use a spill kit for small spills. This can keep the spill from getting worse. They should also know how to stop the flow of product. Make sure they know where the emergency shut-off switch or valve is located.

Class C Operators should also know what to do in the event of emergencies such as a:

- broken dispenser hose;
- spill during product delivery;
- vehicle colliding with a dispenser or canopy; or

Figure 18.5: Workers put spill absorbent on a spill. Should your Class C Operators know how to use absorbent in a spill situation?

- fire.

If an alarm goes off when the Class A and B Operators are away from the site, the Class C Operator should know what the alarm means and what to do. Alarms can include:

- tank monitoring system alarms;
- slow product flow; and
- loss of prime for a suction system.

If you have a tank monitoring system, your Class C Operators should know where the panel is and where your sensors are located. The should also have a basic understanding of what the control panel does and what the lights, audio alarms and status read outs mean.

Finally, the Class C Operator should know where your facility stores its tank operation records. The Class C Operator may need to produce these documents for DEC inspectors and emergency responders. These records include:

- compliance records (Compliance Binder);
- operator training records; and
- the last 30 days of leak detection records.

You must keep the last 30 days of leak detection records stored onsite and it is a good idea for other records, as well. You should make sure all Class C Operators know where this information is kept and keep the records accessible to them (not in a locked back room).

Before you sign off on your Class C Operator's training, they must demonstrate that they understand and can perform their duties. You can check their understanding by asking them questions such as: "What should you do if the monitoring system alarm light goes on?" or "How would you turn off the fuel flow in an emergency?" It is a good idea to ask similar questions from time to time to make sure that your operators remember the emergency procedures.

18.2 Recordkeeping:

You must keep records showing that your Class C Operators have been trained. You must provide the records to DEC, upon request, within three business days. Appendix G has a sample training log you can use to record the training of the operators at the site. The log should include:

- Name of the operator;
- Class of the operator;
- Date the operator was designated as a Class C Operator;
- Date the operator completed testing and/or training;

Training records for Class C Operators must be available to demonstrate compliance.

First responses are critical to dealing with spills and emergencies. Make sure your Class C Operator is trained to respond properly to emergencies.

- Name and signature of trainer;
- Name, address, and phone number of the trainer's employer; and
- Date of any retraining.

You must also keep operator records as long as the operator is designated at a facility and for at least three years after they leave.

18.3 Summary:

- First responses to spills and leaks are critical to reduce the potential for injuries and to minimize releases to the environment.
- Your Class C Operators must know what to do in case of an emergency. Your emergency contact list should be posted where it is immediately accessible at all times.
- Operators should never ignore an alarm or a spill. They should address the situation immediately; waiting "until tomorrow" or just leaving a message with someone is NOT an adequate response.
- Class C Operators must be trained BEFORE they can be assigned operator duties.
- You must maintain records of Class C Operator training.

19.0 Chemical Bulk Storage Requirements

In addition to regulatory requirements related to bulk storage of petroleum products, all Class A and B Operators need to be generally familiar with requirements related to bulk storage of hazardous substances in underground tanks. This chapter describes some important chemical bulk storage (CBS) requirements that differ from requirements for PBS facilities.

Operators who are authorized at CBS facilities should refer to regulations for details of regulatory requirements applicable to their facility and to the particular chemicals stored there. CBS operators will typically require specialized training at their facility in addition to receiving authorization as a Class A and/or B Operator.

Chemical Bulk Storage
6 NYCRR 596-599

- Class A and B Operators need to be generally familiar with requirements related to bulk storage of hazardous substances in underground tanks.
- CBS operators will typically require specialized training at their facility in addition to receiving authorization as a Class A and/or B Operator.

19.1 Definition of Hazardous Substance

As defined in the New York State CBS regulations (6 NYCRR 596-599), *hazardous substance* means:

- a substance included on the list provided under Part 597.3 of the CBS regulations; or
- a hazardous substance mixture.

A *hazardous substance mixture* means a:

- a mixture of any hazardous substances as defined above; or
- certain mixtures of petroleum and hazardous substances not otherwise defined as petroleum.

Mixtures containing less than a total of 1% of any listed hazardous substances are not subject to CBS regulations, though they may be subject to PBS or other requirements. Mixtures containing any amount of hazardous waste are subject to a different set of regulations. Part 597 provides more information on determining whether a substance is subject to CBS requirements.

19.2 CBS Registration

Facilities with underground CBS tanks must be registered, regardless of the tank size. Tanks must be registered prior to the delivery of a hazardous substance to any tank system.

Registrations must be renewed every 2 years (not 5 years, as for PBS facilities) until the facility has been permanently closed, or ownership of the facility has been transferred. In most cases, you must notify DEC at least 3 days prior to installing a new tank.

If ownership of the real property on which a facility is located is transferred, the new owner must submit an application to register the facility within 30 days after the transfer.

Registration fees are assessed per tank and are based on the size of each tank. The fees per tank range from $50 to $125 and there is a cap of $50,000 on the total registration fee for a single facility.

Registrations must be renewed every two years

19.3 Sale of Hazardous Substances

The manufacturer or distributor of a hazardous substance must provide the tank system owner or operator with technical guidance and recommended practices for the storage and handling of the substances purchased. Minimum requirements for this information are listed in the CBS regulations at Part 596.4.

The manufacturer or distributor of a hazardous substance must provide the tank system owner or operator with technical guidance and recommended practices for its storage and handling.

19.4 Inspections and Monitoring

Inspections and monitoring of underground CBS tank systems are similar to the requirements for PBS systems, but there are some differences. Operators should refer to the regulations at Part 598.6.

19.5 Spills and Releases

Reportable quantities have been determined for each listed hazardous substance and are listed at 6 NYCRR 597.4. The following must be reported to DEC's Spill Hotline within 2 hours:

Reportable quantities have been determined for each listed hazardous substance.

1. the release of a reportable quantity that occurs within any 24 hour period;
2. the release of a quantity that is less than a reportable quantity if any of the following conditions exist:
    (a) such release results, or may reasonably be expected to result, in a fire with potential off-site impacts;
    (b) such release results, or may reasonably be expected to result, in an explosion;
    (c) such release results, or may reasonably be expected to result, in a contravention of air quality standards;
    (d) such release results, or may reasonably be expected to result, in vapors, dust and/or gases that may cause illness or injury to persons, not including persons in a building where a release originates; or

(e) runoff from fire control or dilution waters may reasonably be expected to result in or contribute to a contravention of water quality standards.

A release of a hazardous substance mixture is subject to the following reporting requirements:

1. If the quantity of the hazardous constituents of the hazardous substance mixture is known, notification is required where a reportable quantity or more of any individual hazardous constituent is released.
2. If the quantity of one or more of the hazardous constituents of the hazardous substance mixture is unknown, reporting is required where the total amount of the mixture released equals or exceeds the reportable quantity for the hazardous constituent with the lowest reportable quantity.

It is not necessary to report a spill of a reportable quantity of a hazardous substance if all of the following conditions are met:

1. there is control over the spill and it is completely contained;
2. the spill has not and will not reach the land or waters of the State;
3. the spill is cleaned up within two hours after discovery;
4. the total volume of the spill is recovered or accounted for; and
5. the spill will not result in any of the conditions requiring reporting (see list under first paragraph of this section).

It is not necessary to report the release of a hazardous substance that is continuous and stable in quantity and rate, provided that the person responsible for reporting the release submits to DEC a duplicate of the written notification made to the United States Environmental Protection Agency (EPA) pursuant to 40 CFR 302.8. This submission must be made at the same time as the notification is submitted to the EPA.

19.6 Spill Response Plan and Annual Compliance Evaluations

The owner or operator of any facility must prepare and maintain a Spill Prevention Report (SPR) for preventing and responding to spills, releases and accidents at the facility. The report must be filed on the premises of the facility at all times and must be updated at least annually. Requirements for the SPR are listed in Part 598.1(k) and additional guidance is provided in DEC's publication *DER-26 / How to Prepare a Spill Prevention Report for a Chemical Bulk Storage Facility*. Some of those requirements differ from PBS requirements, including provisions for secondary containment of product transfer areas, prevention of mixing incompatible substances, and requirements for a pump and valve maintenance program.

The owner or operator of any facility must prepare and maintain a Spill Prevention Report (SPR) for preventing and responding to spills, releases and accidents at the facility.

19.7 Other Requirements

Requirements for construction, installation, recordkeeping, maintenance, closure, financial responsibility, delivery prohibition, and operator training for CBS tank systems are similar to the PBS requirements, but many details may differ, and operators should refer to the applicable sections of the CBS regulations.

19.8 Summary

- In addition to regulatory requirements related to bulk storage of petroleum products, all Class A and B Operators need to be generally familiar with requirements related to bulk storage of hazardous substances in underground tanks.
- CBS operators will typically require specialized training at their facility in addition to receiving authorization as a Class A and/or B Operator.
- Facilities with underground CBS tanks must be registered, regardless of the tank size.
- Registrations must be renewed every 2 years (not 5 years, as for PBS facilities).
- The manufacturer or distributor of a hazardous substance must provide the tank system owner or operator with technical guidance and recommended practices for the storage and handling of the substances purchased.
- Reportable quantities have been determined for each listed hazardous substance. However, releases of smaller quantities must be reported under certain circumstances. Operators at CBS facilities must be familiar with the details of reporting requirements.
- The owner or operator of any facility must prepare and maintain a Spill Prevention Report (SPR) for preventing and responding to spills, releases and accidents at the facility.

20.0 References And Web Links

New York State Laws, Regulations, and Regulatory Guidance

Environmental Conservation Law Article 17, Title 10, *Control of the Bulk Storage of Petroleum*.

6 NYCRR Part 613, Petroleum Bulk Storage regulations, October 11, 2015.
http://www.dec.ny.gov/regs/2490.html

PBS Registration Worksheet (to determine whether a facility must be registered)
http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsform.pdf

Petroleum Bulk Storage Application
http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsrenewal.pdf

PBS Bulk Storage Application Instructions
http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinstr.pdf

DER-18 / *Petroleum Bulk Storage – New Nonmetallic Underground Piping*,
http://www.dec.ny.gov/regulations/2387.html

DER-25 / Petroleum Bulk Storage (PBS) Inspection Handbook (draft)
http://www.dec.ny.gov/regulations/2387.html

DEC Petroleum Bulk Storage Inspection Form. Note: As of late 2015, DEC was updating this form – check for the most recent edition.
http://www.dec.ny.gov/regulations/2387.html

DEE-22 *PBS Inspection Enforcement Policy*
http://www.dec.ny.gov/regulations/2379.html

Article 12 of the Navigation Law Section 170 et. seq.

6 NYCRR Part 596-599, Chemical Bulk Storage regulations, October 11, 2015.
http://www.dec.ny.gov/regs/2490.html

Federal (EPA) Laws, Regulations, and Regulatory Guidance

40 CFR Part 280, *Federal Underground Storage Tank regulations*, United States Environmental Protection Agency. October 13, 2015.

USEPA publications, available at http://www.epa.gov/oust/pubs/

USEPA, *Musts For USTs: A Summary Of Federal Regulations For Underground Storage Tank Systems*, EPA 510-K-95-002 July 1995] Note: As of late 2015, EPA was updating this publication – check for the most recent edition.

USEPA, *UST Systems: Inspecting and Maintaining Sumps and Spill buckets,* EPA 510-R-05-001, May 2005

USEPA, Source Water Protection Practices Bulletin: Managing Above Ground Storage Tanks to Prevent Contamination of Drinking Water: EPA 916-F-01-022, July 2001

USEPA, Automatic Tank Gauging Systems For Release Detection Reference Manual For Underground Storage Tank Inspectors, EPA 510-B-00-009, August 2000

USEPA, *Doing Inventory Control Right For Underground Storage Tank Inspectors,* EPA 510-B-93-004, November 1993

USEPA, *Straight Talk on Tanks Leak Detection Methods for Petroleum Underground Storage Tanks and Piping,* EPA 510-B-05-001, September 2005

USEPA, *Introduction to Statistical Inventory Reconciliation for Underground Storage Tanks*, EPA 510-B-95-009, September 1995

USEPA, *Volumetric Tank Testing: An Overview* , EPA 625-B-89-009, April 1989

Standards

Underwriters Laboratories, 2600 N.W. Lake Rd., Camas, WA 98607-8542 http://www.ul.com/global/eng/pages/]

Underwriters Laboratories of Canada, 7 Underwriters' Road, Toronto, Ontario, Canada M1R 3B4 [http://www.ul.com/canada/eng/pages/]

American Petroleum Institute, 1220 L Street NW, Washington, DC 20005-4070 [http://www.api.org/Standards/]

Steel Tank Institute, 944 Donata Ct., Lake Zurich, IL 60047 [https://www.steeltank.com]

National Association of Corrosion Engineers, 1440 South Creek Drive, Houston, TX, USA 77084-4906 [http://www.nace.org/content.cfm?parentid=1001&currentID=1001&CFID=2314675&CFTOKEN=64165521]

National Fire Protection Association (NFPA),1 Batterymarch Park, Quincy, MA 02169-7471 [http://www.nfpa.org]

Other References

American Petroleum Institute's Worksafe Service Station Contractor Safety Qualification Program may be found on their website: [https://worksafe.api.org]

National Working Group on Leak Detection Evaluations (NWGLDE) *List of Leak Detection Evaluations for Storage Tank Systems* [http://www.nwglde.org/downloads.html]

New England Interstate Water Pollution Control Commission publishes LUSTLine, a national bulletin on underground storage tanks: [http://www.neiwpcc.org/lustline/] (free online)

Petroleum Equipment Institute, [http://www.pei.org/]

Appendix A
Sample Emergency Contact Placard

Note: this form is an example for reference only. Each facility is responsible for preparing a form that will meet their individual requirements. You MUST customize the form with the appropriate procedures and contact information for your site.

EMERGENCY PETROLEUM SPILL PROCEDURES

Facility Name	DEC PBS #
Facility Address (street address, town, state, and zip code)	
Primary Emergency Coordinator	Back-up Emergency Coordinator
Cell phone number	Cell phone number
Other phone number(s)	Other phone number(s)
Fire Department Telephone	
Location of Tank System Emergency Stop (E-stop)	
Location of Fire Extinguishers and/or Fire Suppression Pull Station (be specific)	
Location of Spill Control Materials (be specific)	
Corporate Emergency Call Center	
NYS **SPILL "HOTLINE"** 1-800-457-7362	Local Health Department
Spill Response Contractor Name and Phone number	

EMERGENCY ASSEMBLY POINT (employees to meet here if evacuated from the building):

IN THE EVENT OF A SPILL EMERGENCY

- Activate the Emergency Stop
- Stop using the underground storage tank system
- Call 911 if needed
- Mitigate any fire, safety or health hazards arising from the release
- Call the Emergency Coordinator(s)
- Call Spill Response Contractor if directed by Emergency Coordinator
- Investigate the discharge source and control if safe to do so
- Notify NYSDEC within two hours of discovering the spill

EXAMPLE

Appendix B
Sample Ten day Inventory Reconciliation form

10-DAY INVENTORY RECONCILIATION WORKSHEET FOR METERED USTs

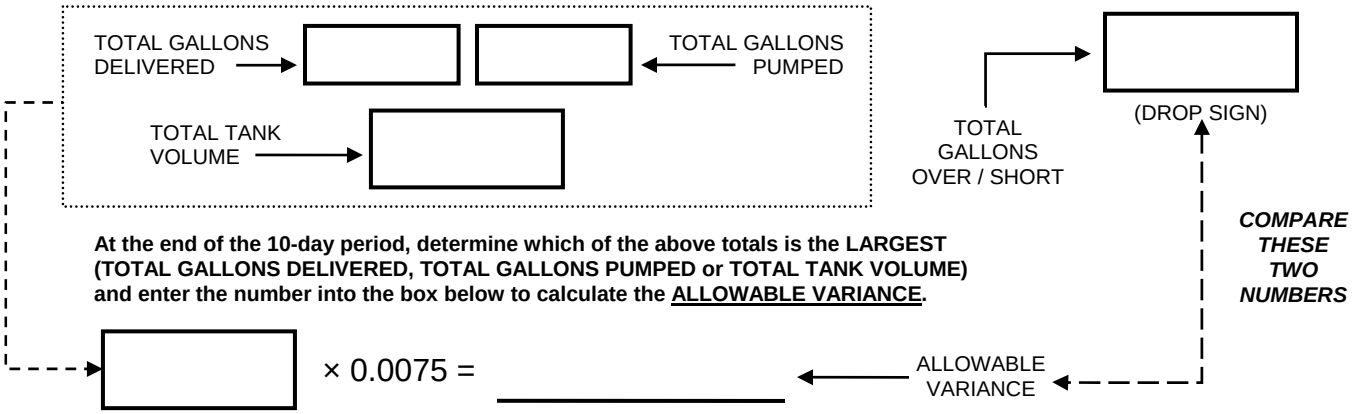
Facility Name: _____ PBS Number: _____

Address: _____ Tank ID No: _____

_____ Product Stored: _____

Inventory record for period from _____/_____/_____ to _____/_____/_____

DAY	DATE	START STICK INVENTORY (GALLONS)	GALLONS DELIVERED (GALLONS)	GALLONS PUMPED (GALLONS)	BOOK INVENTORY [A] (GALLONS)	END STICK INVENTORY (INCHES)	END STICK INVENTORY [B] (GALLONS)	DAILY OVER (+) or SHORT (-) (*END - BOOK*) [B] - [A]	WATER (INCHES)
1		(+)	(-)	(=)					
2		(+)	(-)	(=)					
3		(+)	(-)	(=)					
4		(+)	(-)	(=)					
5		(+)	(-)	(=)					
6		(+)	(-)	(=)					
7		(+)	(-)	(=)					
8		(+)	(-)	(=)					
9		(+)	(-)	(=)					
10		(+)	(-)	(=)					



☞ Is the TOTAL GALLONS OVER/SHORT **LARGER** than the ALLOWABLE VARIANCE? (*circle one*) YES (*see below**) NO

☞ Is there an INCREASE/FLUCTUATION/RECCURENCE of water in the bottom of the tank? (*circle one*) YES (*see below**) NO

* If you answered YES above, if the TOTAL GALLONS OVER/SHORT is **LARGER** than the ALLOWABLE VARIANCE, or if there was an INCREASE/FLUCTUATION/RECCURENCE of water in the bottom of the tank – in accordance with 6 NYCRR Part 613.4(d), the operator MUST initiate an investigation into possible causes. If **WITHIN 48 HOURS** the cause CANNOT be explained by inaccurate recordkeeping, temperature variations, or other factors not related to leakage, the operator MUST notify the owner and the New York State Department of Environmental Conservation (**SPILL HOTLINE: 1-800-457-7362**). The tank MUST be taken temporarily out-of-service in accordance with Part 613.9(a) UNTIL such time that inspections and/or tightness tests are performed, the cause is determined and necessary repairs or replacements are made.

EXPLANATION OF EXCEEDANCE OF ALLOWABLE VARIANCE

Cause determined to be: _____

_____

Describe required action taken (i.e., inspection/repairs/tests, etc.) on ____/____/____ (*date*): _____

_____

_____

_____

_____

_____

_____

Appendix C
Sample Manual Tank Gauging Worksheet

Note: this form is an example for reference only. Each facility is responsible for preparing a form that will meet their individual requirements.

MANUAL TANK GAUGING RECORD

6 NYCRR 613-2.3

DEC PBS #	Year	Tank ID

Completed by (name)

Facility name and address

CIRCLE your tank size, test duration, and weekly/monthly standards in the table below:

Tank Size	Minimum Test Duration (hours)	Weekly Standard 1 test (gallons)	Monthly Standard 4-test average (gallons)
Up to 550 gallons	36	10	5
551-1000 gallons (when tank diameter is 64")	44	9	4
551-1000 gallons (when tank diameter is 48")	58	12	6

Compare your weekly readings and the monthly average of the 4 weekly readings with the standards shown in the table on the left.

If either the weekly or monthly standards have been exceeded, the UST may be leaking. Follow your facility spill response plan, including reporting to the DEC Spill Hotline, 1-800-457-7362.

Keep this record for at least three years.

Start Test (month, day, and time)		First Start Stick Reading (inches)	Second Start Stick Reading (inches)	Average Start Stick Reading (inches)	Average Start Gallons (convert inches to gallons) [a]	End Test (month, day, and time)		First End Stick Reading (inches)	Second End Stick Reading (inches)	Average End Stick Reading (inches)	Average End Gallons (convert inches to gallons) [b]	Change in Tank Volume (gallons) [a – b] Show minus sign if less than zero	Tank Passes Test* (circle YES or NO)
Date: Time:	AM/PM					Date: Time:	AM/PM						Y N
Date: Time:	AM/PM					Date: Time:	AM/PM						Y N
Date: Time:	AM/PM					Date: Time:	AM/PM						Y N
Date: Time:	AM/PM					Date: Time:	AM/PM						Y N
											Add the 4 weekly changes in tank volume		
											Divide the sum by 4 and enter result here. Compare the result to the monthly standard (ignore any minus sign).		Y N

EXAMPLE

Appendix D
Sample Monthly Automatic Tank Gauge Operability worksheet

Note: this form is an example for reference only. Each facility is responsible for preparing a form that will meet their individual requirements.

In- Tank (Auto Tank Gauge) Monitoring System Log

New York tank systems registered with "in-tank system (auto tank gauge)" as their leak detection method must pass a 0.2 gallon per hour (gph) leak test at least once each month. Use this form to record your test results. Also note whether the monitoring system is showing a leak alarm. If your monitoring system is not operating, shows a leak alarm, or fails to pass a leak test you *must report a possible spill* to the NYS Spill Hotline unless the equipment is found to be defective, is IMMEDIATELY repaired or replaced, and additional monitoring does not indicate occurrence of a leak.

SPILL HOTLINE NUMBER: 1-800-457-7362

DEC PBS #:	Owner/Operator:
Facility Name:	Facility address (street, city, state, zip code):

Date	Operational Y/N	Leak Alarm Y/N	Passes 0.2 GPH Test Y/N	Action (*Required* for non-operational system, alarm, or failed test)	Signature of person performing test
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		
	☐ Yes / ☐ No	☐ Yes / ☐ No	☐ Yes / ☐ No		

EXAMPLE

Appendix E
Sample 60-Day Impressed Current Rectifier Inspection Form

Note: this form is an example for reference only. Each facility is responsible for preparing a form that will meet their individual requirements.

IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM: 60-Day Inspection Log. Complete at LEAST every 60 days.		
DEC PBS #:	Rectifier design volts:	Rectifier design amps:
Facility Name	90% design volts:	90% design amps:
Facility address: (street, city, state, zip code):	110% design volts:	110% design amps:
	Location of Rectifier at facility:	

NOTE: If a rectifier is turned on and the Volts and/or Amps readings are zero, **or if any answer in the last three columns is "No",** *immediately* contact a cathodic protection tester or expert to repair the cathodic protection system

Year:	Date Inspected	# Days since last Inspection	Inspector Initials	Rectifier Turned On?	Rectifier DC Output		Rectifier Clock Reading (Hours)	Volts between 90-110% design?	Amps between 90-110% design?	(Hours since last reading)/24= days since last reading?
					Volts	Amps				
January										
February										
March										
April										
May										
June										
July										
August										
September										
October										
November										
December										

Date of any repairs	Description of Repairs

Keep this record for at least 3 years (per 6 NYCRR 613-2.3).

Example

Note: this form is an example for reference only. Each facility is responsible for preparing a form that will meet their individual requirements.

Instructions for completing the Impressed Current Cathodic Protection System 60-Day Inspection Log

If you have an impressed current cathodic protection system, the system rectifier must be inspected every 60 days. To perform the 60-day test inspection:

Rectifier design volts (or amps): Record the "design" volts and amps. These are the volts and amps recorded when the system was installed. There should be a sticker on your rectifier stating the voltage and amps recorded at installation.

90% design volts (or amps) and 110% design volts (or amps): Record the 90% and 110% volts and amps. To calculate: multiply design volts by 0.90 to get 90% volts, then multiply design volts by 1.10 to get 110% volts. Do the same for amps.

Make sure all facility information is filled in on the form.

Date Inspected: Record the date.

Days since last Inspection: Calculate the number of days since the last inspection (should be no more than 60 days). For the first reading on this sheet, refer to the prior inspection sheet. Remember that some months have less than 31 days.

Initials: Enter your initials

Rectifier turned on? Check to make sure your rectifier is on and record Y (yes) or N (no). If the rectifier is turned off, your tank is not protected, and your facility may be in non-compliance with New York State regulations at 6 NYCRR 613. Be sure that facility employees know that they must not turn off the rectifier or the circuit breaker that controls it.

Rectifier DC Output: Record the volts and amps shown on the voltmeter and ammeter display

Rectifier clock hours: Record the number of hours of operation from the clock.

Volts (or amps) between 90-110% design? Compare the volts (or amps) you recorded to the 90% and 110% volts (or amps). If the value you recorded is greater than the 90% value and less than the 110% value, then enter "Y" (yes). Otherwise enter "N" (no).

(Hours since last reading)/24=days since last reading? Subtract the last clock reading from today's clock reading. Divide that number by 24 to get the number of days the rectifier was on (round the number to the ones place). Compare it to the number of days since the last inspection. If they are the same, enter "Y" (yes). If not, enter "N" (no).

If a rectifier is turned on and the volt and/or amp reading recorded is zero, or if any answer in the last three columns is "No", *immediately* contact a cathodic protection tester or expert to repair the impressed current cathodic protection system.

File your inspection report with your tank records and maintain it for at least 3 years.

Example

Appendix F
Sample Maintenance Record Log

Note: this form is an example for reference only. Each facility is responsible for preparing a form that will meet their individual requirements.

Petroleum Bulk Storage Tank Maintenance Record

Petroleum bulk storage facilities (PBS) registered in New York State must keep records of repairs to their tanks. Keeping accurate and complete records will help facilities maintain their tanks, prepare for inspections, and stay in compliance with PBS regulations. Records for each tank must be maintained until the tank is permanently closed or undergoes a change in service, and must be made available to the NYS Department of Environmental Conservation (NYSDEC) upon the Department's request. (Reference: 6 NYCRR 613-1.5)

DEC PBS #:	Owner/Operator:	
Facility Name:	Facility address (street, city, state, zip code):	
Tank ID:	Product stored:	Volume:

Date mm/dd/yyyy	Repair description: state reason and type of repair. State where technician reports and invoices are filed.	Repair performed by	Reported by (Name)
		Company:	
		Name of repairer:	
		Phone #:	
		Address:	
		Company:	
		Name of repairer:	
		Phone #:	
		Address:	
		Company:	
		Name of repairer:	
		Phone #:	
		Address:	

Appendix G
Sample Training Log

C Operator – PBS/CBS Underground Storage Tank Training Record

Facility Name_____ DEC PBS # _____

Facility Owner _____ Facility phone # _____

Address (street, city, state, zip) _____

Name of C Operator (print): _____

is designated as a Class C Operator for the underground storage tanks at this facility. This person has received training from the Class A or B operator listed below, and understands the Class C Operator MUST:

- have specific knowledge of this facility's emergency procedures and alarm response procedures.
- immediately and properly respond to alarms and other indications of emergencies caused by leaks or releases from underground storage tank systems.

List location of written emergency procedures for this facility, including C Operator responsibilities: _____

C Operator was trained by (A or B Operator Contact Information):

Name (print):_____

Title/Department: _____

NYSDEC Authorization #_____ Class A or B (Circle One or Both)

Address:_____

Phone: _____ Secondary Phone: _____

Email: _____

Signature: _____

Date of C Operator training completion: _____ Date operator assumed duties: _____ Retraining: _____

Keep this record for as long as the above Operator performs C Operator duties at this facility, and for at least three years thereafter.

Example