Siegel Energy Company AST Compliance Packet

Siegel Energy Corporation has put this compliance packet together to help your company stay with the Colorado Department of Labor and Employment Division of Oil and Public Safety Storage Tank Regulations 7 C.C.R. 1101-14. We have pulled the most pertinent information and put it into one single document for you to access. Regulation 7 C.C.R 1101-14 can be read in its entirety at https://www.colorado.gov/pacific/ops/RegulationsStatutes.

Aboveground storage tank (AST) systems in Colorado are regulated to protect the people and environment of Colorado from the potentially harmful effects of the regulated substances contained within AST systems. The purpose of the Regulation is to present to owner/operators of AST systems a description of the minimum general standards for design, construction, location, installation and operation of these systems to be in compliance with these regulations and Colorado statutes.

Did you know?

- All AST systems must meet local fire district rules, zoning rules, and requirements of other authorities having jurisdiction over AST systems.
- (ii) C.R.S. § 8-20-231 requires that the design, construction, location, installation, and operation of all liquid fuel product tank systems greater than 60 gallons conform to the minimum standards prescribed by the applicable sections of NFPA fire code. This includes the testing and inspection requirements contained therein.
- AST tanks cannot exceed 660 gallons and must adhere to the following regulations:
    - All ASTs and facility data must be registered, re-registered or updated on a form (form enclosed) regardless of whether the ASTs and facilities are currently in service or in temporary closure;
    - Each owner/operator of an AST must register the AST within 30 days of the after the first day on which any AST is actually used to contain a regulated substance;
    - This registration must be renewed annually during the month designated by the Oil and Public Safety, and during the same month in each succeeding year thereafter.
    - All steel ASTs shall be inspected and maintained in accordance with STI SP001, *Standard for the Inspection of Aboveground Storage Tanks*, or API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*, whichever is applicable;
        - Monthly Inspections: The owner/operator must conduct visual inspections of the tank system each month and document the results of the inspection on a form (form enclosed);
        - Annual Inspections: Shall be performed during one month of the year and then the same month each year after (form enclosed);
        - Periodic Inspections: (form enclosed).
    - Owners/operators must maintain the following records for an AST site as applicable:
        - Installation permits for newly installed tanks, reinstalled used tanks or permits for upgrading existing tanks must be maintained for 5 years.
        - Tank registration records or record of facility ID number retained until closure.
        - Records of repairs that have been performed within the last 5 years.
        - Monthly and annual visual inspection records of the AST system must be kept for one year. Formal inspection reports and supporting documents shall be retained for the life of the tank.
        - Most recent underground piping precision test records must be maintained.
        - Records showing the history of each AST in terms of which Class and type of product has been stored in that tank, shall be maintained for at least one year.
        - Tank ullage documentation (form enclosed) must be kept for one year.
        - Records of the operation of the cathodic protection.
- Any facility that could be reasonably expected to discharge oil into navigable waters of the United States or adjoining shorelines must have and Spill Prevention Containment and Countermeasure Plan and it is the facility owner/operators responsibility to make that determination. For more info, read the attached FACT SHEET on the next page!

Spill Prevention, Control and Countermeasure Plan (SPCC) Program

Bulk Storage Container Inspection Fact Sheet

The inspection requirements of the SPCC rule are designed to detect oil leaks, spills, or other potential integrity or structural issues before they can result in a discharge of oil to navigable waters of the U.S. or adjoining shorelines. Regularly scheduled inspections, evaluations, and testing of bulk oil storage containers by qualified personnel are critical parts of discharge prevention. A container integrity inspection and/or testing program may involve one or more of the following: an external visual **inspection** of containers, foundations, and supports; non-destructive **testing** (examination) to evaluate integrity of certain containers; and additional **evaluations**, as needed, to assess the containers' fitness for continued service. The type of inspection program and its scope will depend on site specific condition and the application of good engineering practices and this can be accomplished by following applicable industry standards.

What oil storage containers do I have to inspect at my facility?

Conduct integrity testing and routinely inspect the following aboveground bulk storage containers with a capacity of 55 gallons or more:

- Large (field-constructed or field-erected) and small (shop-built) bulk storage containers;
- Containers located on, partially in (partially buried, bunkered, or vaulted tanks), and off the ground wherever located; and
- Double-walled containers.

Oil filled equipment is not a bulk storage container and, therefore, not subject to the integrity testing requirements of the SPCC rule.

§§112.8(c)(6), 112.12(c)(6)(i)
Test or inspect each aboveground container for integrity on a regular schedule and whenever you make material repairs. You must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections, which take into account container size, configuration, and design (such as containers that are: shop-built, field-erected, skid-mounted, elevated, equipped with a liner, double-walled, or partially buried). Examples of these integrity tests include, but are not limited to: visual inspection, hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or other systems of non-destructive testing. You must keep comparison records and you must also inspect the container's supports and foundations.

In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices satisfy the recordkeeping requirements of this paragraph.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

How do I inspect aboveground bulk storage containers?

The SPCC rule requires that you:

- Test or inspect **each** container for integrity on a regular schedule and whenever you make material repairs; and
- Frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. This visual inspection is intended to be a routine walk-around and include the container's supports and foundations.
- Identify in your SPCC Plan the type and frequency of testing and inspection for each container and the appropriate qualifications of personnel performing the tests and inspections. You must retain testing and inspection records for 3 years. EPA recommends that formal test records or reports be retained for the life of the container.

Integrity testing is required for all aboveground bulk storage containers located at onshore facilities (except oil production facilities). Integrity testing is necessary to determine if the container (e.g. a tank) is suitable for continued use until the next formal inspection.

Depending on the type of container, integrity testing may be as simple as an external visual inspection or may involve more complicated methods of non-destructive testing such as Magnetic Flux Leakage (MFL) or ultrasonic thickness (UT) measurements, vacuum box testing, and weld inspection in order to adequately assess the container condition.

While frequent external visual inspections can often be completed by trained facility personnel, the requirement to conduct regular integrity tests or inspections may involve hiring specialized personnel (as specified by the applicable industry standard). For example, integrity testing of field-erected aboveground storage tanks in accordance with API 653 involves formal in-service external inspections and formal out-of-service internal inspections to be conducted by an API 653 certified inspector. A formal in-service external inspection involves visual inspection and UT measurements of the shell. A formal out-of-service internal inspection determines the condition of the tank's floor, walls and structure, but should also include the shell, roof, nozzles, and tank appurtenances. The out-of-service inspection typically includes non-destructive testing such as MFL scanning of the floor, vacuum box testing floor welds, helium leak testing, UT measurements, and tank bottom settlement measurements.

How do I develop a program for inspecting and/or testing my containers?

First, you, or a registered Professional Engineer (PE), determine which industry standards are applicable. Then, in accordance with the industry standards determine:

- The appropriate qualifications for personnel performing tests and inspections; and
- The frequency and type of testing and inspections. This must take into account the aboveground container size, configuration, and design (i.e., shop-built, field-erected, skid-mounted, elevated, equipped with a liner, double-walled, or partially buried).

Industry standards describe procedures to identify the condition of the container through formal internal and external inspections conducted by certified personnel. For internal inspections, the container must typically be taken out of service, cleaned, and made ready for personnel to enter the container. Examples of these integrity tests include, but are not limited to: visual inspection, radiographic examination, UT, MFL scanning, helium leak testing, magnetic particle examination, liquid penetrant examination, acoustic emissions-testing, hydrostatic testing, inert gas leak testing or other methods of non-destructive examination. Acoustic emission testing and UT robotic measurement are non-destructive examination methods that can be used while the tank is in-service. Acoustic emission testing is used to determine if there is a leak but does not determine if there is corrosion or metal loss. Hydrostatic testing is typically performed on new tanks and on existing tanks that have had major repairs or alterations. Industry standards may use one, or a combination, of these non-destructive examination methods or tests as part of an integrity testing program.

What are industry standards?
Industry standards are technical guidelines created by experts in a particular industry for use throughout that industry. Standards-developing organizations use a consensus process to establish the minimum accepted industry practice. The SPCC rule requires that the Plan be prepared in accordance with good engineering practice. Standards play a role in determining good engineering practice when developing spill prevention procedures and an inspection program for an SPCC-regulated facility.

The use of a particular standard is up to the owner/operator. When an owner/operator indicates in the SPCC Plan that he intends to use a standard to comply with a particular rule requirement (e.g. integrity testing), then it is mandatory to implement the relevant portions of the standard (i.e. those that address integrity testing of the container).

The American Petroleum Institute (API) Standard 653, "Tank Inspection, Repair, Alteration, and Reconstruction" and the Steel Tank Institute (STI) "SP001 Standard for the Inspection of Aboveground Storage Tanks" (STI SP001) are two commonly used inspection standards for aboveground bulk storage containers.

If you have containers that have never been inspected for integrity then, depending on their size and configuration, industry standards may require that you assess baseline conditions for these containers.

The industry standard you or your PE identifies in your SPCC Plan outlines the specific inspection and integrity testing protocol for the containers at your facility. These protocols may vary depending on the size and configuration of your containers. For example, portable containers (e.g. a drum) have fewer inspection requirements than shop-built and field-erected containers.

Who can help me establish an integrity inspection and/or testing program for my bulk storage containers?

If your SPCC Plan will be certified by a Professional Engineer (PE) then the PE will work with you to establish an inspection and/or testing program that is appropriate for the types of containers at your facility. The PE may consider industry standards and consult with tank inspectors to determine the frequency, type of testing and inspections and the appropriate qualifications for personnel performing the tests and inspections.

If you have a qualified facility and are planning to self-certify your SPCC Plan, then you can develop your inspection and/or testing program by following the protocols identified in the industry standards applicable for your oil storage containers or by contacting tank inspection professionals. Industry standards, such as API 653 and STI SP001 contain requirements to inspect aboveground containers.

More information on industry standards:

API Standard 653
API-653 covers steel storage tanks built to design specifications in the API 650 standard and its predecessor API12. It provides minimum requirements for maintaining the integrity of tanks after they have been placed in service and addresses inspection, repair, alteration, relocation, and reconstruction. This standard is typically used to establish an integrity testing program for field-erected tanks.

Go to the API website for more information on their standards: http://www.api.org/

STI Standard SP001
This standard focuses primarily on inspection of welded, metal, shop-fabricated and small field-erected tanks. Also included is the inspection of smaller, portable containers such as 55-gallon drums, intermediate bulk containers (IBCs) and other such containers that may be of metal or plastic construction.

Go to the STI website for more information on the SP001 standard: http://www.steeltank.com/

If you deviate from the requirements of the standards, then you can do so in accordance with the environmental equivalence provision in §112.7(a)(2) and have a PE certify that portion of your SPCC Plan.

How often do I have to perform inspections or tests?

Testing on a 'regular schedule' means testing per industry standards or at a frequency sufficient to prevent discharges. Industry standards establish the scope and frequency for inspections that considers the particular conditions of the aboveground container. These conditions may include the age, service history, original construction specifications (e.g., shop-built vs. field-erected, welded steel vs. riveted steel), prior inspection results, and the existing condition of the container. It may also consider the degree of risk of a discharge to navigable waters or adjoining shorelines, e.g. containers that are located near saltwater where an accelerated corrosion rate would be expected. The frequency of inspections is based on changing conditions of the container (e.g., corrosion rates, settling, etc.) and the interval between inspections may vary over the lifetime of the container.

Once you determine an inspection schedule for your aboveground containers (based on applicable industry standards), document the schedule in your Plan and conduct inspections according to that schedule. You should also include a description of the conditions of the container that led to the specific inspection schedule identified in the Plan.

How do I establish a baseline condition for my aboveground container?

Industry standards, such as API 653 and STI SP001, contain minimum requirements to inspect aboveground containers and criteria to assess each container's suitability for continued service. The baseline and suitability evaluation provides information on the container's existing condition relative to the design metal thickness and the rate of metal loss from corrosion as well as the anticipated remaining service. In some cases, where baseline information is not known, the testing program may include two data collection periods, one to establish a baseline of the container's existing shell and bottom plate thicknesses, and a second inspection to establish corrosion rates in order to develop the next inspection interval. These inspection intervals establish the frequency of the 'regular schedule' required for testing under the SPCC rule.

When no or only partial baseline information is available for a container(s) at the facility, then the owner/operator needs to schedule integrity testing as soon as possible. One time frame you may consider is that the SPCC Plan be reviewed at the facility every five years. As an example, when no or only partial baseline information is available for a container, the Plan preparer should schedule integrity testing within the first five-year review cycle of the SPCC Plan to establish a regular testing schedule based on current container conditions and the applicable industry standard. For this example, the review cycle would begin on the revised rule implementation compliance date of November 10, 2011 and the first (baseline) container inspection or integrity test would be completed by November 10, 2016.

The implementation of the testing program should be in accordance with industry standards and establish appropriate inspection priorities among multiple containers at a facility. For instance, special consideration may be discussed in the Plan for containers for which the age and existing condition is not known (no baseline or only partial information exists); older containers; or those in more demanding service. These higher priority containers may be targeted for inspection in the schedule before other aboveground containers where the baseline information is known.

Section 112.7 of the rule states that if the Plan calls for additional facilities or procedures, methods, or equipment not yet fully operational, you must discuss these items in separate paragraphs, and must explain separately the details of installation and operational start-up. Therefore, if an owner or operator has yet to implement the integrity testing program, the SPCC Plan should establish and document a schedule (in accordance with good engineering practice and the introductory paragraph of 112.7) that describes the projected implementation of the integrity testing program for the aboveground bulk storage containers at the facility. The owner or operator must then implement the inspection program in accordance with the SPCC Plan.

Do I need to establish a baseline when the standard requires only visual inspections?

No, if the industry standard only requires visual inspections for the container (e.g., certain shop-built containers) then a baseline is not necessary. The standard establishes a frequency for visual inspections rather than basing the interval on the container's corrosion rate. On the other hand, a baseline is necessary for most non-destructive testing protocols, because the container's corrosion rate impacts the frequency/interval of future formal integrity testing inspections.

Owners and operators need to refer to the particular industry standard identified in the SPCC Plan to determine the scope of inspection and testing requirements. For example under the STI SP001 standard, visual inspection is allowed for portable containers such as drums and totes. A baseline determination of metal thickness of a portable container is not required prior to implementing the visual only integrity testing inspection protocol.

How do I demonstrate in my SPCC Plan that I have an inspection and/or testing program for containers that I have not yet inspected?

The introductory paragraph of §112.7 of the SPCC rule allows for the owner or operator to describe procedures, methods, or equipment that are not yet operational in the SPCC Plan and in this event, requires the owner or operator to include a discussion of the details.

The Plan preparer must provide details in the Plan including a timeline to gather the necessary baseline data to establish a regular schedule of integrity testing in accordance with §§112.8(c)(6) and 112.12(c)(6). The Plan preparer may need to consult with a tank professional and/or PE to determine the scope of the integrity testing program for the containers. Include in your Plan a description of the inspection program including:

- The type of integrity inspection that will be conducted (i.e., visual or another non-destructive method),
- The applicable industry standard that the serves as the basis for program
- The implementation schedule for inspecting containers, and
- Any other considerations that went into the development of the inspection program.

Ensure that your containers fall within the scope of the industry inspection standard that you elect to follow and include a description of the inspection procedures in the SPCC Plan. Finally, include information on recordkeeping procedures in the Plan.

What are my recordkeeping requirements?

The facility integrity testing and inspection program must be documented in the Plan, including the schedule for conducting inspections and tests. The SPCC rule requires that you keep a record of the inspections and tests, signed by the appropriate supervisor or inspector, for a period of three years. However, industry standards often advise that records for formal inspections and tests be maintained for the life of the container.

EPA strongly recommends that you keep comparison records of integrity inspections and tests as directed in the standard, but no less than three years in accordance with the SPCC record retention requirement, in order to identify changing conditions of the oil storage container. Records of inspections and tests kept under usual and customary business practices satisfy the recordkeeping requirements.

Can I visually inspect large shop-built oil storage containers to satisfy the integrity inspection and testing requirements of the SPCC rule?

Yes, under certain circumstances visual inspection alone may suffice. However, the SPCC rule requires that inspections be in accordance with industry standards. For tanks larger than 5,000 gallons, most industry standards require more than a visual inspection by the owner or operator.

The SPCC Guidance for Regional Inspectors[1] published in 2005 describes an example that may be environmentally equivalent to the integrity testing requirements of the SPCC rule at that time. The example indicates that visual inspection plus certain additional actions to ensure the containment and detection of leaks may be appropriate for bulk oil storage containers with a capacity up to 30,000 gallons. This example is based on a policy that described the environmental equivalence flexibility available to a PE with respect to integrity testing in a letter to the Petroleum Marketers Association of America (PMAA).[2] This policy was established at a time when the rule specifically required that integrity testing include more than just a visual inspection. While the policy and approach for the use of environmental equivalence described in this letter is still valid, EPA revised the integrity testing provision in 2008 to allow inspection requirements outlined in industry standards to be used without the need for environmental equivalence determinations certified by a PE. A major industry standard for integrity testing (STI SP001) was modified since the letter to PMAA was written to outline "good engineering practice" for integrity testing of shop-built containers. This may affect a PE's decision whether to certify an environmentally equivalent approach as described in the PMAA letter, or to follow an industry standard.[3]

If an owner or operator wants to deviate from applicable industry standards to develop an integrity testing program, then a PE must certify an environmentally equivalent alternative in the SPCC Plan.

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[1] *SPCC Guidance for Regional Inspectors*, December 2, 2005 (http://www.epa.gov/osweroe1/content/spcc/spcc_guidance.htm)

[2] Letter to Daniel Gilligan, President, Petroleum Marketers Association of America, from Marianne Lamont Horinko, Assistant Administrator, Office of Solid Waste and Emergency Response, EPA, May 25, 2004.

[3] Further details can be found in the Federal Register; 73 FR 74265 (December 5, 2008).

Furthermore, the Plan must provide the reason for the deviation, describe the alternative approach, and explain how it achieves environmental protection equivalent to the applicable industry standard.

How do I inspect mobile or portable bulk storage containers?

Industry standards (such as STI SP001) refer to specific conditions for which visual inspection alone is an appropriate method for verifying the integrity of certain smaller shop-built containers (e.g., portable containers such as drums and totes). These conditions include container type, size, and configuration (such as whether the container is in contact with the ground or has appropriate secondary containment). For example, according to STI SP001, when portable containers have adequate secondary containment then visual inspection of these containers is acceptable and will satisfy the integrity testing requirements of the rule.

Do I have to use an industry standard?

No. Although the rule requires that you consider industry standards when developing an inspection program, you can incorporate an environmentally equivalent inspection protocol when you and the certifying PE decide that another approach would be more appropriate or cost effective, based on site-specific factors. You can use an environmentally equivalent alternative when you include in your SPCC Plan the reason for deviating from the rule requirements and describe the alternative method in detail, including how it is environmentally equivalent.

An environmentally equivalent approach to following the applicable industry standard may be a site-specific inspection program that is based on elements designed to minimize the risk of container failure and allow detection of leaks before they impact navigable waters or adjoining shorelines. These elements may be based on a combination of various industry standards and good engineering practice.

Can I deviate from portions of an industry standard?

Yes, under certain circumstances it may be appropriate to deviate from portions of an industry standard. As you develop your inspection and/or testing program, you must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections, which take into account container size, configuration and design. However, you and the certifying PE can decide to deviate from a portion of a standard when another approach would be more appropriate or cost effective, based on site-specific factors.

You must document your environmentally equivalent alternative, the reason for deviating from the rule requirement, and describe the alternative method in detail, including how it is environmentally equivalent in your SPCC Plan.[4] An environmentally equivalent approach to following the applicable industry standard may be a site-specific inspection program based on a combination of elements from various industry standards and good engineering practice, or other measures that effectively minimize the risk of container failure and that allow for the detection of leaks before they impact navigable waters or adjoining shorelines.

What if no industry standard applies to my container?

If no industry standard applies to a particular container (e.g. Animal Fats and Vegetable Oils (AFVOs) containers, containers storing oils that have a specific gravity greater than 1.0, or oil containers operated at elevated temperatures), then the Plan preparer should consider the manufacturer's specifications and instructions for the proper use and maintenance of the equipment, appurtenance, or container. If no industry standards or manufacturer's instructions apply, the Plan preparer may also call upon his/her professional experience and/or consult with tank inspection professionals to develop site-specific inspection and testing requirements for the facility or equipment that are in accordance with good engineering practice and document them in the Plan.

A customized, site-specific inspection program based on relevant industry standards (in whole or in part) and other good engineering principles is often referred to as a 'hybrid' program. A PE does not need to provide and certify an environmental equivalence justification for implementing a hybrid

[4] See 73 FR 74264 (December 5, 2008)

inspection program when industry standards do not apply to a container or the container is outside the scope of the standard. However, you must describe the procedures for this inspection program in your SPCC Plan and keep a record of inspections and tests for three years. EPA recommends that formal test records or reports be retained for the life of the container.

What are some recommended elements for a site-specific integrity inspection and/or testing program (hybrid testing program)?

The components of a hybrid inspection program would likely include frequent visual inspections by the owner, as well as periodic inspections (plus testing as appropriate) by a certified inspector. Any hybrid inspection program should include an evaluation of the principal elements that would cause a tank to fail, and how the inspection program addresses finding such conditions, or prevents such conditions from continuing to the point of failure. For example, internal and external corrosion conditions must be considered, and a testing method developed to assure that the condition is identified and measured. Conditions that may lead to a structural failure should be identified, for example a failing foundation, and evaluation methods developed to identify the condition.

In all cases, careful consideration should be given to discovering such conditions that may not be identifiable from visual examination, such as the bottom of floor plates. Hybrid programs should also include evaluation of container modifications made since last examination that may degrade integrity or lead to failure.

Recommended Elements for a Hybrid Inspection Program

Here is a partial list of items to consider regarding the elements of a hybrid inspection program.

For shop-built tanks:

- Visually inspect exterior of tank;
- Evaluate external pitting;
- Evaluate “hoop stress and longitudinal stress risks” where corrosion of the shell is present;
- Evaluate condition and operation of appurtenances;
- Evaluate welds;
- Establish corrosion rates and determine the inspection interval and suitability for continued service;
- Evaluate tank bottom where it is in contact with ground and no cathodic protection is provided;
- Evaluate the structural integrity of the foundation;
- Evaluate anchor bolts in areas where required; and
- Evaluate the tank to determine it is hydraulically sound and not leaking.

For field-erected tanks:

- Evaluate foundation;
- Evaluate settlement;
- Determine safe product fill height;
- Determine shell corrosion rate and remaining life;
- Determine bottom corrosion rate and remaining life;
- Determine the inspection interval and suitability for continued service;
- Evaluate welds;
- Evaluate coatings and linings;
- Evaluate repairs for risk of brittle fracture; and
- Evaluate the tank to determine it is hydraulically sound and not leaking.

How do I inspect and/or test containers that store animal fats or vegetable oils (AFVO)?

The inspection and/or testing requirements for AFVO at §112.12(c)(6)(i), are identical to those described above at §112.8(c)(6). The SPCC rule also provides differentiated, more flexible, alternative requirements at §112.12(c)(6)(ii) for AFVO containers that meet certain criteria to address differences in the way certain AFVOs may be stored and handled at a facility.

Facility owners with AFVO containers that meet the following criteria can conduct visual inspections of their containers when the following criteria are met:

- Are subject to the Food and Drug Administration (FDA) regulations in 21 CFR part 110, *Current Good Manufacturing Practice in Manufacturing, Packing or Holding Human Food*;
- Are elevated;
- Are made from austenitic stainless steel;
- Have no external insulation; and
- Are shop-built.

The owner or operator is required to document the procedures for inspections and testing in their SPCC Plan, including those for AFVO bulk storage containers that are eligible for these differentiated requirements.

§§112.12(c)(6)(ii)
For bulk storage containers that are subject to 21 CFR part 110, are elevated, constructed of austenitic stainless steel, have no external insulation, and are shop-fabricated, conduct formal visual inspection on a regular schedule. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. You must determine and document in the Plan the appropriate qualifications for personnel performing tests and inspections. Records of inspections and tests kept under usual and customary business practices satisfy the recordkeeping requirements of this paragraph (c)(6).

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

In addition, when an AFVO bulk storage container falls outside the scope of an industry standard then the owner or operator may develop a site-specific inspection and testing program for the equipment that is in accordance with good engineering practice and documented in the Plan. A PE does not need to provide and certify an environmental equivalence justification for implementing a hybrid inspection program when industry standards do not apply to a container or the container is outside the scope of the standard. However, the hybrid inspection program must be in accordance with good engineering practice.

What are the requirements to test completely buried tanks?

You must regularly leak test completely buried metallic storage tanks installed on or after January 10, 1974. ‘‘Regular testing’’ means testing in accordance with industry standards or at a frequency sufficient to prevent leaks. Appropriate methods of testing should be selected based on good engineering practice and tests conducted in accordance with 40 CFR part 280 or a State program approved under 40 CFR part 281 are acceptable. Describe the method and schedule for testing your completely buried tanks in the SPCC Plan. For more information on preventing and detecting underground storage tank system leaks see http://epa.gov/oust/prevleak.htm.

§§112.8(c)(4), 112.12(c)(4)
Protect any completely buried metallic storage tank installed on or after January 10, 1974 from corrosion by coatings or cathodic protection compatible with local soil conditions. You must regularly leak test such completely buried metallic storage tanks.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

What are the requirements to inspect bulk storage containers at an onshore oil production facility?

You must periodically and upon a regular schedule visually inspect each bulk storage container (e.g. oil stock tanks[5], flow-through process vessels, and produced water containers) for deterioration and maintenance needs in accordance with §112.9(c)(3),

§112.9(c)(3)
…periodically and upon a regular schedule visually inspect each container of oil for deterioration and maintenance needs, including the foundation and support of each container that is on or above the surface of the ground.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

[5] A stock tank is storage tank for oil production after the oil has been treated (Schlumberger Oil Field Glossary http://www.glossary.oilfield.slb.com/default.cfm)

including the foundation and support of each container that is on or above the surface of the ground. This inspection is intended to be a routine walk-around where you look at the container and supports and foundations for any evidence of damage, corrosion, or leaks. Document the inspection procedures and schedule in the Plan and conduct inspections in accordance with the Plan.

EPA recommends that the inspection occur on an ongoing routine basis and be conducted by qualified personnel. Before the PE certifies the SPCC Plan in accordance with §112.3(d), he must consider applicable industry standards when developing the Plan and establishing procedures for inspections and tests. API has developed Recommended Practice 12R1 "Recommended Practice for Setting, Maintenance, Inspection, Operation and Repair of Tanks in Production Service" that includes inspection procedures for tanks employed in onshore oil production service.

More information on industry standards:

API RP 12R1
API RP 12R1 (R2008) Recommended Practice for Setting, Maintenance, Inspection, Operation and Repair of Tanks in Production Service contains recommendations for good practices in:

- The collection of well or lease production,
- Gauging,
- Delivery to pipeline carriers for transportation, and
- Other production storage and treatment operations.

This recommended practice is intended primarily for applications to tanks fabricated to API Specs 12B, 12D, 12F, and 12P when employed in on-land production service; but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. API 12R1 is available for purchase at:

Additionally, the owner or operator of an onshore oil production facility must conduct *integrity testing* for any bulk storage containers for which he determines secondary containment is impracticable. The Plan must follow the provision of §112.7(d) and clearly explain why such measures are not practicable; for bulk storage containers, conduct both periodic integrity testing of the containers and periodic integrity and leak testing of the valves and piping; and, unless you have submitted a response plan under §112.20, provide the following in the Plan:

- An oil spill contingency plan following the provisions of part 109 of this chapter, and
- A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.

For More Information

Review the Oil Pollution Prevention regulation (40 CFR part 112):
http://www.gpoaccess.gov/cfr/

Call the Superfund, TRI, EPCRA, RMP, and Oil Information Center:
(800) 424-9346 or (703) 412-9810
TDD (800) 553-7672 or (703) 412-3323
http://www.epa.gov/superfund/resources/infocenter

To Report an Oil or Chemical Spill Call the National Response Center:
(800) 424-8802 or (202) 267-2675
TDD (202) 267-4477

Colorado Department of Labor and Employment
Division of Oil and Public Safety – Compliance Section
633 17th Street, Suite 500
Denver, CO 80202-3610

Phone: 303-318-8525
Fax: 303-318-8488
Email: cdle_oil_inspection@state.co.us
Web: www.colorado.gov/ops

Aboveground Storage Tank System: ☐ Installation or ☐ Upgrade Application

A site plan (electronic or less than 11"x17") that includes the name and address of facility, lot dimensions and distances from tanks to the nearest important building, roads, railroads, property lines, dikes or impoundment areas, existing tanks and dispensers must accompany this application. We encourage you to submit this application via email to cdle_oil_inspection@state.co.us.

☐ E-Generator ☐ Bulk Plant ☐ Fleet/Commercial ☐ Bulk & Retail Motor Fueling ☐ Retail Motor Fueling

Facility Information		Owner Information	
Facility Name:		Owner Name:	
Address:		Address:	
City/State/ZIP:		City/State/ZIP:	
Facility Contact Name:		Contact Name:	
Email Address:		Email Address:	
Phone Number:		Phone Number:	

Description of Work

Type of Facility

☐Retail ☐Bulk Plant ☐Commercial/Industrial ☐Airport ☐Federal ☐State Government ☐Emergency Generator ☐Other

Tank Information						OPS Use Only
Tank Installation Type						☐ Yes ☐ No ☐ N/A
(OPS Use) Tank ID Number						☐ Yes ☐ No ☐ N/A
Tank Manufacturer						☐ Yes ☐ No ☐ N/A
Tank Material Construction						☐ Yes ☐ No ☐ N/A
Tank Wall Type						☐ Yes ☐ No ☐ N/A
Total Capacity	gal		gal		gal	☐ Yes ☐ No ☐ N/A
Tank Orientation						☐ Yes ☐ No ☐ N/A
Serial Number						☐ Yes ☐ No ☐ N/A
Compartmentalized Tank?	☐Yes	☐No	☐Yes	☐No	☐Yes	☐No	☐ Yes ☐ No ☐ N/A
Compartment Sizes							☐ Yes ☐ No ☐ N/A
Product						☐ Yes ☐ No ☐ N/A
Product (Second Compartment)						☐ Yes ☐ No ☐ N/A
Manifolded Tank?	☐Yes	☐No	☐Yes	☐No	☐Yes	☐No	☐ Yes ☐ No ☐ N/A
Vaulted Tank?	☐Yes	☐No	☐Yes	☐No	☐Yes	☐No	☐ Yes ☐ No ☐ N/A
Delivery Spill Containment Manufacturer						☐ Yes ☐ No ☐ N/A
Delivery Spill Containment Size	gal		gal		gal	☐ Yes ☐ No ☐ N/A
Delivery Spill Containment Type						☐ Yes ☐ No ☐ N/A
Overfill Prevention Method						☐ Yes ☐ No ☐ N/A
Overfill Prevention Manufacturer						☐ Yes ☐ No ☐ N/A
Emergency Relief Vent Type						☐ Yes ☐ No ☐ N/A
Emergency Relief Vent Size	in		in		in	☐ Yes ☐ No ☐ N/A
Tank Corrosion Protection						☐ Yes ☐ No ☐ N/A
Interstitial Monitoring (Tank)?	☐Yes	☐No	☐Yes	☐No	☐Yes	☐No	☐ Yes ☐ No ☐ N/A
Interstitial Monitor (Double Wall)						☐ Yes ☐ No ☐ N/A
Automatic Tank Gauge (ATG)?	☐Yes	☐No	☐Yes	☐No	☐Yes	☐No	☐ Yes ☐ No ☐ N/A
ATG Manufacturer						☐ Yes ☐ No ☐ N/A
ATG Model						☐ Yes ☐ No ☐ N/A
ATG with CSLD?	☐Yes	☐No	☐Yes	☐No	☐Yes	☐No	☐ Yes ☐ No ☐ N/A
Tank/Facility Fencing (Security)						☐ Yes ☐ No ☐ N/A
Periodic Inspection Information						
Diking/Impounding Description						☐ Yes ☐ No ☐ N/A
Spill Control Method						☐ Yes ☐ No ☐ N/A
Floor Material Type						☐ Yes ☐ No ☐ N/A
Wall Material Type						☐ Yes ☐ No ☐ N/A
Continuous Release Detection Method						☐ Yes ☐ No ☐ N/A
Release Prevention Barrier Type						☐ Yes ☐ No ☐ N/A
Periodic Inspection Category Type						☐ Yes ☐ No ☐ N/A

Distance Information				
Tank-to-Building Distance	ft	Tank-to-Property Line Distance	ft	☐ Yes ☐ No ☐ N/A
Tank-to-Important Building Distance	ft	Tank-to-Dispenser Distance	ft	☐ Yes ☐ No ☐ N/A

Piping Information				
Piping Installation Type				☐ Yes ☐ No ☐ N/A
Total Piping Length	ft in	ft in	ft in	☐ Yes ☐ No ☐ N/A
Repair or Replacement?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐ Yes ☐ No ☐ N/A
Replacement Piping Length				☐ Yes ☐ No ☐ N/A
Piping Type				☐ Yes ☐ No ☐ N/A
Piping System Type				☐ Yes ☐ No ☐ N/A
Piping Material				☐ Yes ☐ No ☐ N/A
Piping Wall Type				☐ Yes ☐ No ☐ N/A
UG Piping Manufacturer				☐ Yes ☐ No ☐ N/A
Model (Pisces, Red Thread)				☐ Yes ☐ No ☐ N/A
Leak Detector Manufacturer				☐ Yes ☐ No ☐ N/A
Leak Detector Type (UG Piping)				☐ Yes ☐ No ☐ N/A
STP Piping Connector (Tank)				☐ Yes ☐ No ☐ N/A
STP Corrosion Protection				☐ Yes ☐ No ☐ N/A
STP Containment Manufacturer				☐ Yes ☐ No ☐ N/A
STP Containment Model				☐ Yes ☐ No ☐ N/A
Interstitial Monitoring (Pipe)?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐ Yes ☐ No ☐ N/A
Interstitial Monitoring Type				☐ Yes ☐ No ☐ N/A
Stage #1 Vapor Recovery?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐ Yes ☐ No ☐ N/A
Stage #1 Piping Size				☐ Yes ☐ No ☐ N/A

Dispenser Information				
New Dispenser Installed?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐ Yes ☐ No ☐ N/A
Dispenser Manufacturer				☐ Yes ☐ No ☐ N/A
Dispenser Model				☐ Yes ☐ No ☐ N/A
NTEP Certificate of Conformance Number				☐ Yes ☐ No ☐ N/A
Number of Dispensers				☐ Yes ☐ No ☐ N/A
Blender Dispensers?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐ Yes ☐ No ☐ N/A
Meters per Dispenser				☐ Yes ☐ No ☐ N/A
Under Dispenser Containment (UDC)?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐ Yes ☐ No ☐ N/A
UDC Manufacturer				☐ Yes ☐ No ☐ N/A
UDC Model				☐ Yes ☐ No ☐ N/A
UDC Piping Connector (Dispenser)				☐ Yes ☐ No ☐ N/A
UDC Corrosion Protection				☐ Yes ☐ No ☐ N/A

Installer Information			
Company Name:		Contact Name:	
Address:		City/State/ZIP:	
Email Address:		Phone Number:	

Fire Department Information			
Fire Department Name:		Fire Protection District Notified?	
Contact Name:		Phone Number:	

Calibration Company Information			
Company Name:		Calibration Certification Number:	
Contact Name:		Phone Number:	

Owner Authorization	
Owner/Representative Name:	
Date:	

For OPS Use Only					
FID#:			OID #:		
Date Received:		Reviewed By:		Decision Date:	
Decision Made:	☐ Approved	☐ Denied	☐ Deficiency	☐ Modified	
Additional Date Received:		Reviewed By:		Additional Decision Date:	
Additional Decision Made:	☐ Approved	☐ Denied	☐ Deficiency	☐ Modified	

Buried Piping Test			
Test Method	Test Date	OPS Inspector	Results

Secondary Containment Test			
Test Method	Test Date	OPS Inspector	Results

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Aboveground Storage Tank Registration Form

(Revised 12/2015)

Any person who owns an aboveground storage tank (AST) system must complete the form and submit it to OPS (Division of Oil and Public Safety) within 30 days of operation.

Date of First Fuel Delivery:	The date the fueling system was installed and operational. Without this date, the form is considered invalid.

Facility Information

Facility Type:	☐ Retail ☐ Bulk Plant ☐ Commercial/Industrial ☐ Airport ☐ Federal ☐ State Government ☐ Other					
Facility Name:		Company ID #:		**OPS Facility I.D. #:**		
Facility Address:	Street:					
	City:	County:			ZIP:	
Contact Name:			Phone #:			
Email Address:			# of ASTs:			

Owner/Operator Information

Owner Type:	☐ Federal Government ☐ State Government ☐ Local Government ☐ Commercial ☐ Private				
Are the ASTs located on land within an Indian Reservation or Trust Lands outside reservation boundaries? ☐ Yes ☐ No	*If the answer is yes:* *Are the ASTs owned by a Native American Nation or Tribe?* ☐ *Yes* ☐ *No* *Is there a Tribe or Nation where the ASTs are located?* ☐ *Yes* ☐ *No*				
Owner/Operator Name:		Contact Phone #:		Cell Phone #:	
Contact Name:		Email Address:			
Mailing Address:	Street/PO Box:				
	City:	State:		ZIP:	

Primary Contact Information ☐ **Same As Owner Information**

Company Name:		Contact Phone #:		Cell Phone #:	
Contact Name:		Email Address:			
Mailing Address:	Street/PO Box:				
	City:	State:		ZIP:	

Financial Responsibility Information

I have met the financial responsibility requirements (in accordance with 40 CFR 280 Subpart B) by using one of the following mechanisms:

Insurance Type:	☐ Self-Insurance	☐ Commercial Insurance	☐ Risk Retention Group	☐ Local Government Financial Test	☐ Guarantee
	☐ Letter of Credit	☐ Bond Rating Test	☐ State Funds	☐ Trust Fund	☐ Other

Tank Information

OPS Tank ID #:				**OPS Use Only**
Tank Release Detection Method:				☐ Yes ☐ No ☐ N/A
Piping Release Detection Method:				☐ Yes ☐ No ☐ N/A
Tank Corrosion Protection Method:				☐ Yes ☐ No ☐ N/A
Piping Corrosion Protection Method:				☐ Yes ☐ No ☐ N/A

Owner/Operator Certification

I certify that I am familiar with the above information, and I believe that this information is true, accurate and complete.

Printed Name:		Title:	
Owner/Operator Signature:		Date:	

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UST CLASS A/B OPERATOR DESIGNATION

(REVISED 11/2013)

Owner ID#:		Owner Business Name:		Owner/Primary Contact Name:	
Street Address:		Form Completed By:		Date:	

List the Certified Operator(s) that will be designated to the facility/facilities. The first row is an example.

Designated Operator							Operator Training		
ID#	Operator Name	Operator Company	Operator Address	Operator Phone	Operator Fax	Operator Email	Training Company	Certificate #	Date Trained
1	Joe Smith	Example Oil Co.	45678 E. Example Street Denver, CO 80202	303-303-3030	303-303-3031	jsmith@example.com	XYZ Training Co. (OPS approved)	A123456	11/1/09
2									
3									
4									
5									
6									

Designate the operator type for the facility/facilities. The first row is an example.

OPS Facility ID #	Facility Name	Facility Address	Designated Operator Type (A, B, or A/B)	ID# (from above)
12345	Example Oil Co.	45678 E. Example Street, Denver, CO 80202	A/B	1

The Owner or Operator signing below certifies, under civil and criminal penalties for making a false submission to the State of Colorado, that the information listed above is accurate.

Tank Owner/ Operator Name:		Tank Owner/ Operator Signature:		Date:	

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OPS Approved A/B Operator Trainers

(Revised 12/2015)

Classroom Training

CGRS, Inc.
1301 Academy Court
Fort Collins, CO 80524
Contact: Tim Goodrich
Phone: (800) 288-2657
Email: tim@cgrs.com
Website: www.cgrs.com

Palmetto Environmental Group
4995 York Street
Denver, CO 80216
Contact: John Drafts, PG
Phone: (303) 825-8117
Email: mail@palmetto-environmental.com
Website: www.palmetto-environmental.com

Petro Classroom
9237 Ward Parkway, Suite 220
Kansas City, MO 64114
Contact: Katie Gonzales
Phone: (844) 303-6752
Email: kmg@petroclassroom.com
Website: www.petroclassroom.com

Petroleum Testing, LLC
430 Gardenia Drive
Cheyenne, WY 82009
Contact: Robert Lucht
Phone: (800) 376-4091
Email: lucht@bresnan.net
Website: www.ptllc.org

Tait Environmental Services
Phone: (800) 530-5683
Website: www.pstinstruction.com

Wasteline, Inc.
Phone: (605) 348-0244 or (970) 564-1380
Contact: Nathan Barton
Email: SDLiberty@aol.com
Website: www.ptllc.org

Webinar and Computer-Based Training

Petro Classroom
Contact: Patrick Vuchetich
Phone: (844) 303-6752
Email: info@petroleumclassroom.com
Website: www.petroclassroom.com

Practical American Safety Solutions (PASS) Training
Contact: Raymond Rees
Phone: (765) 281-5588 or (866) 735-0201
Email: contact@passtesting.com
Website: http://passtesting.com

UST Training
Contact: Ben Thomas
Phone: (866) 301-8265 or (360) 321-4776
Email: Ben@USTtraining.com
Website: http://www.usttraining.com

Retraining Only: Computer-Based Training

Antea Group Training
3855 Precision Drive, Suite 160
Loveland, CO 80538
Phone: (800) 477-7411 or (970) 292-1889
Website: www.anteagroup.com

Company-Specific Training

Western Refining (Classroom Training for Western Refining Employees Only)
Contact: Richard Groot
Phone: (505) 899-7389
Website: www.wnr.com

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AST Inspectors

(From STI website list - updated 5/23/2016)

LAST	FIRST	ID#	COMPANY	CITY	ST	PHONE	EMAIL	LICENSE EXPIRES
Banbury	Patrick	AST 12154	Tait Environmental Services	Anaheim	CA	714-560-8222	pbanbury@tait.com	January 13, 2017
Bell	Ryan	AST 40110	CGRS, Inc.	Fort Collins	CO	970-493-7780	ryan@cgrs.com	November 19, 2020
Benton	Phillip	AST R11183	HDR Environmental	Fort Collins	CO	970-419-4388	phillip.benton@hdrinc.com	November 10, 2016
Bigham	Bernard	AST 11402	Chesapeake Environmental	Baltimore	MD	410-686-8070	bernardbigham@comcast.net	October 14, 2016
Burr	Eugene Ray	AST 50409	Eaton Sales & Service LLC	Denver	CO	303-672-0120	geneb@eatonmetal.com	October 2, 2014
Christensen	Michael	AST R10141	Xcel Energy	Minneapolis	MN	612-630-4221	michael.t.christensen@xcelenergy.com	July 20, 2015
Coleman	Wacey	AST 990425	CGRS, Inc.	Fort Collins	CO	970-493-7780	wacey@cgrs.com	March 27, 2020
DeCianne	Vincent	AST 40610	URS Corporation	Denver	CO	303-796-4755	vincent.decianne@urs.com	November 19, 2015
Formanek	Brian	AST 912608	Palmetto Environmental	Denver	CO	303-825-8117	brian@palmetto-environmental.com	September 14, 2017
Franz	Edward J.	AC 25010	Industrial Inspectors, Inc.	Canon City	CO	719-275-1623	edfranz67@gmail.com	October 10, 2020
Harris	Les	AST 912613	Les Harris & Associates, Inc.	Aurora	CO	303-693-6699	lesharrisinc@earthlink.net	September 14, 2017
Hart	Richard	API 23943	JD2 Environmental Inc.	West Chester	PA	610-430-8151	rhart@jd2env.com	October 31, 2014
Heller	Walt	AST 135009	CGRS, Inc.	Fort Collins	CO	970-493-7780	walter@cgrs.com	October 25, 2018
King	Mike	AST-990376	Burgess Spring Environmental	Longmont	CO	720-201-2191	miking4321@gmail.com	October 3, 2019
Modlin	Matt	AST 61809	OCCU-TEC, INC.	Riverside	MO	816-994-3437	mmodlin@occutec.com	December 18, 2014
Nowicki	Scott	AC 19009	TTI Inspections	Moorestown	NJ	856-840-8800x11	scottn@ttienv.com	December 5, 2019
Peters	Josh	AST 121282	JD2 Environmental Inc.	West Chester	PA	610-430-8151	jpeters@jd2env.com	December 14, 2017
Piercey	David	AST 121283	JD2 Environmental Inc.	West Chester	PA	610-430-8151	dpiercey@jd2env.com	December 14, 2017
Posey	Chris	API 43847	Applus RTD	Longmont	CO	970-624-6051	Chris.Posey@applusrtd.com	May 31, 2015
Redd	Brett	AST 912624	STTI	Grand Junction	CO	970-243-1642	brett@sttienviro.com	September 14, 2017
Ridgway	Bill	AST 1274-12	Wm. C. Ridgway	Laveen	AZ	267-625-7504	wmcridgway@yahoo.com	July 7, 2017
Skidmore	Stephen	API 2051	Skidmore Inspection Services	Keenesburg	CO	281-682-6426	SSkidmore@suncor.com	April 30, 2017
Slack	Phillip A.	AC32312	Acuren Inspection	Denver	CO	303-307-4503	pslack@acuren.com	February 28, 2017
Sminkey	Bill	API 21983	Tourgee & Associates, Inc.	New Castle	DE	410-356-3108	bsminkey@taiengineering.com	October 31, 2015
West	John R.	AST 42510	URS Corporation	Denver	CO	303-291-8334	john.west@urs.com	November 19, 2015

NOTE: If you would like your name removed from this list or if you are certified by STI SP001 or API 653 to conduct formal AST inspections and would like your name added to this list, please contact Zach Hope at 303-318-8545 or zach.hope@state.co.us.

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PERIODIC AND FORMAL AST INSPECTION WORKSHEET

STI SP001 - Spill control, CRDM, and RPB

Spill control

- Properly designed, installed, and maintained remote impounding;
- Properly designed, installed, and maintained diking; or
- Secondary containment (double-wall) ASTs meeting **all** of the following criteria.
  - Capacity does not exceed 12,000 gals for Class I or 20,000 gals for Class II or IIIA liquids.
  - All tank piping connections are made above the maximum liquid level.
  - Means provided to prevent the release of liquid from the tank by siphon flow.
  - Means provided for determining the level of liquid in the tank, which is accessible to the delivery operator.
  - Be equipped with overfill protection equipment (95% automatic shutoff or 90% audible alarm that can be heard by the delivery operator)
  - Be equipped with spill prevention equipment at the tank fill connections.
  - Be protected from collisions.

CRDM (Continuous release detection method)

- Double-wall or double-bottom ASTs that can be monitored for releases using manual, mechanical or electronic methods (e.g., UL 142 double-wall ASTs, UL 2085 ASTs, etc.);
- Elevated ASTs where the shell of the tank is not in contact with earthen materials and is able to be visually inspected for leaks on all sides (e.g., single-wall UL 142 skid tanks, horizontal tanks on concrete saddles, etc.);
- STI SP001, 5th Edition does not require RPB under an elevated AST as in previous editions; or
- Release prevention barriers **(RPB)** installed under the AST that are capable of diverting leaks to a point where they can be easily detected (such as along the perimeter of the tank, or a sump), and capable of preventing liquid from contaminating the environment. RPBs must be compatible with the liquid being stored, meet proper engineering standards, and be maintained in good condition so as to be liquid-tight across their surface (e.g., steel, concrete and elastomeric liners).

Requirements for Release Prevention Barriers (RPBs)

For existing materials to be considered RPBs, the following criteria must be met.

Concrete

- Concrete pads/slabs must be constructed of 6 inch minimum reinforced concrete (or approved and stamped as sufficient by a professional engineer) that has been poured monolithically, and without expansion joints
- The pad/slab must extend beyond the perimeter of the tank by 6 inches minimum for its entire perimeter to allow for visual inspection
- The concrete must be undamaged and in good condition (no cracks, spalling, etc).

Liners and other approved suitable materials (including elastomeric, geosynthetic clay, etc)

- Must meet appropriate engineering standards, be compatible with the liquid stored, and have a permeability rate of 1×10^{-7} cm/sec or less to the liquid stored
- The material must extend beyond the perimeter of the tank by 6 inches minimum for its entire perimeter to allow for visual inspection
- The material must be undamaged and in good condition (no cracks, rips, tears, broken seams, etc.).

Table 1: STI SP001 Inspection Frequency

Tank Capacity (gal)	Category 1	Category 2	Category 3
660 - 1,100	**M A**	**M A**	**M A E**(10) **L**(10)
1,101 – 5,000	**M A**	**M A E**(10) **L**(10)	**M A E**(5) **L**(5) **I**(10) or **M A L**(2) **E**(5)
5,001 – 30,000	**M A E**(20)	**M A E**(10) **I**(20) or **M A E**(5) **L**(10)	**M A E**(5) **L**(5) **I**(10) or **M A L**(1) **E**(5)
30,001 – 39,999	**M A E**(20)	**M A E**(5) **L**(5) **I**(15)	**M A E**(5) **L**(5) **I**(10)

M = Monthly inspection
A = Annual Inspection
E = Formal External Inspection (years)
I = Formal Internal Inspection (years)
L = Leak Test (years)

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PERIODIC AND FORMAL AST INSPECTION WORKSHEET

(REVISED 11/2013)

1. Previous STI SP001 or API 653 Formal External/Internal Inspection Information				**No Previous Inspection** ☐
Previous Formal External Inspection Date		Age **(on 10/14/2012)**	Years	Months
Previous Formal Internal Inspection Date		Age **(on 10/14/2012)**	Years	Months
Previous Leak Testing Date		Age **(on 10/14/2012)**	Years	Months
2. Age of Tank **(on 10/14/2012)**	Years	Months		**Unknown** ☐
Date of Manufacture (from tank data plate)				
3. Age of Installation **(on 10/14/2012)**	Years	Months		
Tank Installation Date				
4. Tank Capacity	gal			
5. Does the tank have spill control?	☐ Yes ☐ No **Note: Some method of spill control is required for all ASTs.**			
If the answer is yes, which type of spill control does the tank have?	☐ Proper Remote Impounding ☐ Proper Diking (Earthen/Concrete/Steel) ☐ Double-wall AST (meeting all required criteria for no additional diking/impounding)			
6. Does the tank have CRDM?	☐ Yes ☐ No			
If the answer is yes, which type of CRDM does the tank have?	☐ Double-wall AST ☐ Elevated AST ☐ RPB (as described in #7 below)			
7. RPB Type	☐ None/NA ☐ Concrete ☐ Geosynthetic Liner	☐ Elastomeric Liner ☐ Compacted Clay Liner		
8. Tank Category	☐ Category 1 (**"Yes"** response on #5 *and* #6) ☐ Category 2 (**"Yes"** response on #5 *and* **"No"** response on #6) ☐ Category 3 (**"No"** response on #5 *and* #6)			
9. Required Inspections And Frequencies (from Table 1)	☑ Monthly Inspection ☑ Annual Inspection ☐ Formal External Inspection: Every years ☐ Formal Internal Inspection: Every years ☐ Leak Test: Every years			
10. Due Dates for the First Formal Inspections and Leak Testing **(using largest age from #2 or #3, or #1 if applicable)**				
Formal External Inspection	☐ Before 10/14/2012 (if age is greater than frequency) ☐ By (oldest date from #2 or #3, *or* #1 *if applicable* + inspection frequency) ☐ N/A			
Formal Internal Inspection	☐ Before 10/14/2012 (if age is greater than frequency) ☐ By (oldest date from #2 or #3, *or* #1 *if applicable* + inspection frequency) ☐ N/A			
Leak Test	☐ Before 10/14/2012 (if age is greater than frequency) ☐ By (oldest date from #2 or #3, *or* #1 *if applicable* + inspection frequency) ☐ N/A			

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AST MONTHLY VISUAL INSPECTION CHECKLIST

(REVISED 11/2013)

OPS Facility ID#:		Facility Name:		Inspection Date:	
Street Address:		City:		ZIP:	
# of Tanks Inspected:		Tank IDs:			

Any item marked "No" requires additional information to describe the condition and date the condition is corrected.

	ITEM	STATUS	COMMENTS / DATE CORRECTED
	Primary Tank and Piping		
1	Is tank exterior (roof, shell, ends, connections, fittings, valves, etc.) free of visible leaks? **Note**: *If "No", identify tank and describe leak.*	☐Yes ☐No	
2	Is aboveground piping (valves, fittings, connections, pumps, etc.) free of visible leaks? **Note**: *If "No", identify location and describe leak.*	☐Yes ☐No	
3	Are ladders/platforms/walkways secure with no sign of severe corrosion or damage?	☐Yes ☐No ☐N/A	
4	Are all tank openings properly sealed (capped, plugged, covered, blind flanged, etc.)?	☐Yes ☐No	
5	Is the tank liquid level gauge readable and in good working condition?	☐Yes ☐No ☐N/A	
6	Is overfill prevention equipment in good working condition (overfill valve, audible alarm, etc.)? **Note**: *Verify operation of audible alarms.*	☐Yes ☐No ☐N/A	
7	Is the spill container (spill bucket) empty, free of visible leaks and in good working condition?	☐Yes ☐No ☐N/A	
8	Is the primary tank free of water?	☐Yes ☐No	
9	Is the area around the tank (concrete surfaces, ground, containment, etc.) free of visible signs of leakage?	☐Yes ☐No	
10	Is the cathodic protection system in operating condition and functional? **Note**: *Inspection required every 60 days only.*	☐Yes ☐No ☐N/A	
11	Rectifier reading Volts: _____ Amps: _____ Are these readings within manufacturer specifications? **Note**: *Inspection required every 60 days only.*	☐Yes ☐No ☐N/A	
	Double-Wall Tank		
12	For double-wall tanks, is interstice free of liquid?	☐Yes ☐No ☐N/A	
13	For double-wall tanks, is interstitial monitoring equipment in good working condition?	☐Yes ☐No ☐N/A	
	Containment (Diking/Impounding)		
14	Is the containment free of liquid, debris, combustible materials, and empty or full drums/barrels?	☐Yes ☐No ☐N/A	
15	Are dike drain valves closed and in good working condition?	☐Yes ☐No ☐N/A	
16	Are containment egress pathways clear and any gates/doors operable?	☐Yes ☐No ☐N/A	
	Other Conditions		
17	Is the system free of any other conditions needing to be addressed for continued safe operation or that may affect the site SPCC Plan?	☐Yes ☐No	

Inspector Information

Printed Name:		Signature:		Date:	

Colorado Department of Labor and Employment
Division of Oil and Public Safety – Compliance Section
633 17th Street, Suite 500
Denver, CO 80202-3610

Phone: 303-318-8500
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Web: www.colorado.gov/ops

AST ANNUAL VISUAL INSPECTION CHECKLIST

(REVISED 11/2013)

OPS Facility ID#:	Facility Name:	Inspection Date:
Street Address:	City:	ZIP:
# of Tanks Inspected:	Tank ID Numbers:	

Any item marked "No" requires additional information to describe the condition and date the condition is corrected.

	ITEM	STATUS	COMMENTS / DATE CORRECTED
	Containment		
1	Is the containment structure in satisfactory condition (diking, impounding, double-wall tank, etc.)?	☐Yes ☐No	
2	Are the drainage pipes/valves in good working condition for continued service?	☐Yes ☐No ☐N/A	
	Tank Foundation/Supports		
3	Free of tank settlement or foundation washout?	☐Yes ☐No	
4	Concrete pad or ring wall free of cracking or spalling?	☐Yes ☐No	
5	Tank supports in satisfactory condition?	☐Yes ☐No	
6	Is water able to drain away from tank?	☐Yes ☐No	
7	Is the grounding strap between the tank and foundation/supports in good condition?	☐Yes ☐No ☐N/A	
	Cathodic Protection		
8	Are cathodic protection system in operating condition and functional?	☐Yes ☐No ☐N/A	
9	Rectifier reading Volts: _____ Amps: _____ Are these readings within manufacturer specifications?	☐Yes ☐No ☐N/A	
	Tank External Coating		
10	Free of visible signs of paint failure?	☐Yes ☐No	
	Tank Shell / Heads		
11	Free of noticeable shell/head distortions, buckling, denting, or bulging?	☐Yes ☐No	
12	Free of visible signs of shell/head corrosion or cracking?	☐Yes ☐No	
	Tank Manways, Piping, and Equipment		
13	Flanged connection bolts tight and fully engaged with no sign of wear or corrosion?	☐Yes ☐No ☐N/A	
	Tank Roof		
14	Free of standing water on roof?	☐Yes ☐No	
15	Free of visible signs of coating cracking, crazing, peeling, or blistering?	☐Yes ☐No	
16	Free of holes?	☐Yes ☐No	

	ITEM	STATUS	COMMENTS/DATE CORRECTED			
	Venting					
17	Normal and emergency vents free of obstructions?	☐Yes ☐No				
18	Normal vent on tanks storing gasoline equipped with pressure/vacuum vent cap?	☐Yes ☐No ☐N/A				
19	Is the emergency vent in good working condition and functional, and tested as required by manufacturer?	☐Yes ☐No				
	Insulated Tanks					
20	Free of missing insulation?	☐Yes ☐No ☐N/A				
21	Insulation free of noticeable areas of moisture?	☐Yes ☐No ☐N/A				
22	Insulation free of mold?	☐Yes ☐No ☐N/A				
23	Insulation free of visible signs of damage?	☐Yes ☐No ☐N/A				
24	Insulation adequately protected from water intrusion?	☐Yes ☐No ☐N/A				
	Level and Overfill Prevention Equipment					
25	Electronic or mechanical liquid level gauge tested for proper operation?	☐Yes ☐No ☐N/A				
26	Electronic or mechanical liquid level gauge calibrated during the previous 12 months?	☐Yes ☐No ☐N/A				
27	Is overfill prevention equipment in good working condition? ☐ Overfill Valve ☐ Audible Alarm ☐ Both	☐Yes ☐No ☐N/A	Verified by:	Inspection Date:	Operational? ☐ Yes ☐ No	Repair Date:
28	Is tank ullage being determined and documented before filling the tank?	☐Yes ☐No ☐N/A				
	Electrical Equipment					
29	Is tank/equipment grounding adequate and in good condition?	☐Yes ☐No				
30	Is electrical wiring for control boxes, lights, and other high voltage equipment in good condition?	☐Yes ☐No ☐N/A				
	Tank / Piping Release Detection					
31	Is inventory control being performed and documented as required?	☐Yes ☐No ☐N/A				
32	Is release detection being performed and documented on underground piping as required?	☐Yes ☐No ☐N/A				
	Additional Comments					
	Inspector Information					
	Printed Name:	Signature:			Date:	

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ABOVEGROUND STORAGE TANK ULLAGE LOG - DELIVERIES ONLY

(REVISED 11/2013)

(Use a Separate Log Sheet for Each Tank)

The Colorado Storage Tank Regulations require that owners/operators and delivery operators determine tank ullage (*available capacity) before any tank filling begins, and to constantly monitor the operation to prevent tank overfills and spills. §3-3-1(a)(4)(ii)(A) requires that ullage calculations be documented on this or an equivalent form if the tank is not equipped with a 95% automatic shutoff or 90% audible alarm that can be heard by the delivery operator. If ullage is calculated by an Automatic Tank Gauge (ATG), it is acceptable to save the ATG inventory tape that shows tank ullage in gallons. Keep these records at least twelve (12) months. However, it is advisable to keep records indefinitely, since they may be required as part of the compliance review concerning a claim for reimbursement from the Petroleum Storage Tank Fund.

Facility Name:				Facility ID # (if known):	
Street Address:				Product in Tank:	
City:		ZIP:		Tank Capacity (gallons):	
Start Date:		End Date:		90 % Capacity (gallons):	

Example: If the tank capacity is 1,000 gallons, the 90% capacity would be 900 gallons. To calculate the ullage prior to any filling activity, directly measure the liquid level in feet/inches and convert the measurement to gallons using the correct tank chart. Subtract the converted gallons from the 90% capacity to calculate the ullage/available capacity (e.g. 900- 300= 600). Once this is complete, tank filling can begin.

Date	Gauge or Stick Reading	Conversions to Gallons	*Ullage	Quantity Added	Initials
12/01/07	15"	300	900-300=(600)	500	CW

Report suspected or confirmed leaks to the Division of Oil & Public Safety within 24 Hours at 303-318-8547.

ARTICLE 3 ABOVEGROUND STORAGE TANKS

Section 3-1 AST Program Scope and Applicability

Aboveground storage tank (AST) systems in Colorado are regulated to protect the people and environment of Colorado from the potentially harmful effects of the regulated substances contained within AST systems. The purpose of this article is to present to owner/operators of AST systems a description of the minimum general standards for design, construction, location, installation and operation of these systems to be in compliance with these regulations and Colorado statutes. Further description of these requirements can be found in guidance documents, policies and procedures provided by the Director.

(a) The provisions in these regulations apply to all regulated substance AST systems unless specifically restricted to a specific system. It is the owner/operator's responsibility to ensure compliance with all requirements.

(1) Aside from meeting these regulatory requirements:

(i) All AST systems must meet local fire district rules, zoning rules, and requirements of other authorities having jurisdiction over AST systems.

(ii) C.R.S. § 8-20-231 requires that the design, construction, location, installation, and operation of all liquid fuel product tank systems greater than 60 gallons conform to the minimum standards prescribed by the applicable sections of NFPA fire code. This includes the testing and inspection requirements contained therein.

(2) For the purposes of these regulations, a tank's capacity is determined by the aggregate capacity of all individual primary tank compartments contained within the outer shell or structure of the tank, whether there is a shared bulkhead or not. Each compartment of an AST must meet the operational requirements contained herein individually (e.g. venting, overfill prevention, release detection, etc.)

Example: A single concrete-encased UL 2085 AST whose construction consists of two individual 500 gallon UL 142 ASTs wrapped in a polyethylene liner is considered as having a capacity of 1,000 gallons. Each compartment (tank) must be equipped to meet operational requirements

(b) Per C.R.S. § 8-20.5-101(2)(b), the following ASTs or AST systems are excluded from these AST regulations:

(1) Not withstanding requirements listed in (a)(1) of this section, any AST whose capacity is greater than 39,999 gallons or less than 660 gallons;

(2) Any AST system that contains a de minimis concentration of regulated substances;

(3) Any AST systems containing radioactive material that are regulated under the Atomic Energy Act;

(4) Any AST system that is part of an emergency generator system at nuclear power generation facilities;

(5) ASTs used to store liquefied petroleum gases that are not liquid at standard temperature and pressure;

(6) ASTs used to store liquids whose fluidity is less than that of 300 penetration asphalt when tested in accordance with ASTM D 5.

(7) A wastewater treatment tank system that is part of a wastewater treatment facility;

(8) Equipment or machinery that contains regulated substances for operational purposes;

(9) Farm and residential tanks or tanks used for horticultural or floricultural operations.

(10) Aboveground storage tanks located at natural gas pipeline facilities that are regulated under state or federal natural gas pipeline acts;

(11) Aboveground storage tanks associated with natural gas liquids separation, gathering, and production;

(12) Aboveground storage tanks associated with crude oil production, storage, and gathering;

(13) Aboveground storage tanks at transportation-related facilities regulated by the federal department of transportation;

(14) Aboveground storage tanks used to store heating oil for consumptive use on the premises where stored

(15) Aboveground storage tanks used to store flammable and combustible liquids at mining facilities and construction and earthmoving projects, including gravel pits, quarries, and borrow pits where, in the opinion of the Director, tight control by the owner or contractor and isolation from other structures make it unnecessary to meet the requirements of this article.

Section 3-2 AST System Design, Construction, Location and Installation

These performance standards apply to regulated AST systems that store stable liquids in atmospheric ASTs where internal operating pressures do not exceed 2.5 psi. Requirements for the storage of other liquids in other types of ASTs at greater operating pressures are found in NFPA 30, and must be followed.

3-2-1 Design

(a) Tank Design and Materials of Construction

(1) All tanks shall be designed and built in accordance with recognized good engineering standards for the material of construction being used and shall be of steel or approved noncombustible material, with the following limitations and exceptions:

(i) The material of tank construction shall be compatible with the liquid to be stored. In case of doubt about the properties of the liquid to be stored, the supplier, producer of the liquid, or other competent authority shall be consulted.

(A) Tanks designed and intended for above ground use shall not be used as underground tanks.

(B) Tanks designed and intended for underground use shall not be used as aboveground tanks.

(ii) Tanks constructed of combustible materials shall be subject to the approval of the Director and limited to:

(A) Use where required by the properties of the liquid stored, or

(B) Storage of Class IIIB liquids above ground in areas not exposed to spill or leak of Class I or Class II liquid, or

(C) Storage of Class IIIB liquids inside a building protected by an approved automatic fire extinguishing system.

(iii) Atmospheric tanks shall not be used for the storage of a liquid at a temperature at or above its boiling point. Atmospheric tanks shall be labeled and shall be built, installed, and used within the scope of a nationally recognized construction standard; such as U.L. 142, or API Standard 650, or an equivalent standard.

(b) Vent Piping

The design, fabrication, assembly, testing, and inspection of all piping systems for flammable and combustible liquids shall be in conformance with the applicable sections of ANSI B31, *American National Standard Code for Pressure Piping* and installed in conformance with the following requirements:

(1) Where vent pipe outlets for tanks storing Class I liquids are adjacent to buildings or public ways, they shall be located so that the vapors are released at a safe point outside of buildings and not less than 12 ft (3.6 m) above the adjacent ground level. In order to aid their dispersion, vapors shall be discharged upward or horizontally away from closely adjacent walls. Vent outlets shall be located so that flammable vapors will not be trapped by eaves or other obstructions and shall be at least 5 ft (1.5 m) from building openings.

(i) Vent piping that it is attached to or within a canopy or its supporting structure must extend a minimum of 5 ft (1.5 m) above the highest projection of the canopy, including the canopy fascia. When modifications to the canopy are made, this distance must be maintained.

Exception: Where the canopy or canopy modifications were installed before January 1, 2004, changes to existing vent piping are not required.

(2) The manifolding of tank vent piping shall be avoided except where required for special purposes such as vapor recovery, vapor conservation, or air pollution control. When tank vent piping is manifolded, pipe sizes shall be such as to discharge, within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are subject to the same fire exposure.

(3) Vent piping for tanks storing Class I liquids shall not be manifolded with vent piping for tanks storing Class II or Class III liquids unless means are provided to prevent the vapors from Class I liquids from entering tanks storing Class II or Class III liquids, to prevent possible change in classification of the less volatile liquid.

(c) Normal Venting

(1) Atmospheric tanks shall be adequately vented to prevent the development of vacuum or pressure that can distort or damage the tank or that exceeds the design pressure, as a result of filling or emptying the tank or atmospheric temperature changes.

(2) For ASTs installed after September 30, 1994, normal vents shall be:

(i) sized in accordance with American Petroleum Institute Standard No. 2000, Venting Atmospheric and Low-Pressure Storage Tanks, or another accepted standard; or

(ii) at least as large as the filling or withdrawal connection, whichever is larger, but in no case less than 1 1/4 in. (3 cm) nominal inside diameter.

(3) If any AST installed after September 30, 1994 has more than one fill or withdrawal connection and simultaneous filling or withdrawal can be made, the vent size shall be based on the maximum anticipated simultaneous flow.

(4) Except for tanks containing Class III liquids, vents shall be equipped with venting devices.

(i) Tanks containing Class IA liquids shall be equipped with venting devices that are closed, except when venting under pressure or vacuum conditions.

(ii) Tanks containing Class IB and IC liquids shall be equipped with venting devices that are closed, except when venting under pressure or vacuum conditions, or with listed flame arresters.

(iii) Tanks containing Class II liquids shall be equipped with venting devices that will protect the tank against the intrusion of water, debris, or insects.

(5) Adequate ventilation either natural or forced must exist to guarantee that flammable liquid vapors cannot build up to 25% of the lower flammable limit anywhere, because of the presence of the tank facility in question.

(d) Emergency Relief Venting

(1) Every AST shall have some form of construction or device that will relieve excessive internal pressure caused by exposure to fires.

(i) This requirement shall also apply to each compartment of a compartmented tank, the interstitial space of secondary containment-type tanks, and the enclosed space of closed-top dike tanks, except where the tank was constructed prior to the publication of the 1996 edition of NFPA 30.

Exception: Tanks larger than 12,000 gallons capacity storing Class IIIB liquids do not require emergency relief venting unless they are within the diked area or the drainage path of Class I or Class II liquids.

(2) In a vertical tank, the construction referred to in 3-2-1(d)(1) may take the form of a floating roof, lifter roof, a weak roof-to-shell seam, or other approved pressure-relieving construction. The weak roof-to-shell seam shall be constructed to fail preferential to any other seam. Design methods that will provide a weak roof-to-shell seam construction are contained in API 650, Welded Steel Tanks for Oil Storage, and UL 142, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids.

(3) Where entire dependence for emergency relief is placed upon pressure-relieving devices, the total venting capacity of both normal and emergency vents shall be enough to prevent rupture of the shell or bottom of the tank if vertical, or of the shell or heads if horizontal.

(4) The total capacity of both normal and emergency venting devices shall not be less than the requirements of NFPA 30.

(5) Emergency relief vent devices shall be vapor tight and shall be permitted to be a self-closing manway cover, a manway cover provided with long bolts that permit the cover to lift under internal pressure, or additional or larger relief valve or valves.

(6) Each commercial tank venting device shall be stamped with the operational pressures and capacities required by NFPA 30.

(7) For the extension of emergency vent piping, piping to or from approved emergency vent devices shall be sized to provide emergency vent flows that limit the back pressure to less than the maximum pressure permitted by the design of the tank.

(8) The required emergency relief venting capacities for tanks and devices, requirements for tanks storing unstable liquids, additional requirements for tanks other than atmospheric, and other requirements for emergency relief venting design are found in NFPA 30.

(e) Tank Openings Other than Vents

(1) Each connection to an AST through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank.

(2) Each connection below the liquid level through which liquid does not normally flow shall be provided with a liquid-tight closure. This may be a valve, plug, or blind, or a combination of these.

(3) Openings for gauging on tanks storing Class I liquids shall be provided with a vapor-tight cap or cover. Such covers shall be closed when not gauging.

(4) Fill pipes that enter the top of a tank shall terminate within 6 in (15 cm) of the bottom of the tank. Fill pipes shall be installed or arranged so that vibration is minimized.

Exception: Fill pipes in tanks whose vapor space, under normal operating conditions, is not in the flammable range need not meet this requirement.

(5) Filling and emptying connections for Class I, Class II, and Class IIIA liquids that are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 ft. (1.5 m) away from any building opening. Such connections for any liquid shall be closed and liquid tight when not in use and shall be properly identified.

(f) Static Protection for all ASTs

(1) Grounding Required

All equipment such as tanks, machinery and piping, where an ignitable mixture may be present shall be bonded or connected to a ground.

(2) Bonding Facilities Required

The bond or ground or both shall be physically applied or shall be inherently present by the nature of the installation; and

(i) Bonding facilities for protection against static sparks during the loading of tank vehicles through open domes shall be provided:

(A) Where Class I liquids are loaded, or

(B) Where Class II or Class III liquids are loaded into vehicles that may contain vapors from previous cargoes of Class I liquids; and

(ii) Bonding facilities shall consist of a metallic bond wire permanently electrically connected to the fill stem, or to some part of the rack structure in electrical contact with the fill stem. The free end of such wire shall be provided with a clamp or equivalent device for convenient attachment to some metallic part in electrical contact with the cargo tank of the tank vehicle. (This can be a simple ground clamp used while loading).

(g) Standards for Piping, Valves, and Fittings

(1) General and Suction Systems.

(i) For the purpose these regulations, piping connected to an AST is considered to be suction piping when the entire length of piping is at a higher elevation than the

AST it is connected to, and where there is no pump installed between the tank and piping. All other piping connected to an AST is pressurized piping.

(A) ASTs with underground piping must meet **all** of the requirements for underground pressurized piping contained in Article 2 of these regulations, including the construction, corrosion protection, and installation requirements of 2-2-1 (b), the secondary containment requirements of 2-2-1(e) for piping installed after April 14, 2011, and release detection requirements of 2-3-4-3.

(ii) Liquid shall not be dispensed from a tank by pressurization of the tank. Means shall be provided to prevent the release of liquid by siphon flow.

(iii) On or after October 14, 2012, where an AST is at an elevation that produces a gravity head on a motor fuel dispensing device, the tank outlet shall be equipped with a device (such as a normally closed solenoid valve) that will prevent gravity flow from the tank to the dispenser. This device shall be located adjacent to and downstream of the main valve specified by 3-2-1(e)(1) of these regulations. The device shall be installed and adjusted so that liquid cannot flow by gravity from the tank to the dispenser in the event of failure of the piping or hose when the dispenser is not in use.

(iv) Where a suction-type dispensing system includes a booster pump or where a suction-type dispensing system is supplied by a tank in a manner that produces a gravity head on the dispensing device, a listed, vacuum-actuated shutoff valve with a shear section or equivalent type valve shall be installed directly under the dispensing device.

(A) Suction-type dispensing systems installed before April 14, 2011 that include a solenoid valve at the tank outlet, and a listed, rigidly anchored emergency shutoff valve incorporating a fusible link or other thermally actuated device, designed to close automatically in event of severe impact or fire exposure are deemed to meet this requirement.

(v) For ASTs installed after September 30, 1994, shutoff and check valves shall be equipped with a pressure-relieving device that will relieve the pressure generated by thermal expansion back to the tank.

(vi) Piping shall be routed so that exposure to physical damage is minimized.

(vii) Piping systems shall be supported and protected against physical damage, including damage from stresses arising from settlement, vibration, expansion, or contraction.

(2) Remote Pumping Systems

This section shall apply to systems for dispensing Class I liquids and Class II liquids where such liquids are transferred from storage to individual or multiple dispensing devices by pumps located other than at the dispensing devices.

(i) Pumps shall be listed and designed or equipped so that no part of the system will be subjected to pressures above its allowable working pressure.

(ii) Each pump shall have installed, on the discharge side, a listed leak detection device that will provide an indication if the piping and dispensers are not essentially liquid tight. Each leak-detecting device shall be checked and tested at least annually according to the manufacturer's specifications.

(iii) Pumps installed above-grade and outside of buildings shall be located not less than 10 ft. (3 m) from lines of adjoining property that can be built upon and not less than 5 ft. (1.5 m) from any building opening. Pumps shall be substantially anchored and protected against physical damage.

(iv) A listed rigidly anchored emergency shutoff valve, incorporating a fusible link or other thermally actuated device designed to close automatically in event of severe impact or fire exposure, shall be installed in accordance with the manufacturer's instructions in the supply line at the base of each individual island-type dispenser or at the inlet of each overhead dispensing device. An emergency shutoff valve incorporating a slip-joint feature shall not be used. The automatic closing feature of this valve shall be checked at the time of initial installation and at least once a year thereafter by manually tripping the hold-open linkage.

(v) Any vapor return pipe inside the dispenser housing shall have a shear section or flexible connector so that the liquid emergency shutoff valve will function as described above.

(3) Breakaway devices

A listed emergency breakaway device designed to retain liquid on both sides of the breakaway point shall be installed on each hose dispensing Class I and Class II liquids. Such devices are not required at marine service stations.

(h) Compatibility Requirements

Owners/operators must use an AST system made of or lined with materials that are compatible with the substance stored in the AST.

[Note: Owners/operators storing alcohol blends may use the following codes to comply with the requirements of this section: (a) American Petroleum Institute Publication 1626, "Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations"; and (b) American Petroleum Institute Publication 1627, "Storage and Handling of Gasoline-Methanol/Co-solvent Blends at Distribution Terminals and Service Stations."]

(i) Security

(1) Where tanks are supported above the foundations, tank supports shall be installed on firm foundations. Steel supports or exposed piling supports for tanks storing Class I, Class II, or Class IIIA liquids shall be protected by materials having a fire resistance rating of not less than 2 hours.

(2) Every tank shall be supported to prevent the excessive concentration of loads on the supporting portion of the tank shell.

(3) The area within the fence (if applicable) and within any dike shall be kept free of vegetation, debris, and any other material that is not necessary to the proper operation of the tank and piping system.

(4) After December 22, 1996, tanks that are not listed as UL 2085 Protected Tanks where fuel is dispensed into vehicles shall be protected against vehicular collision by suitable barriers, which may include buildings and open space which the Director approves in writing.

(5) Tanks which are not enclosed in vaults shall be enclosed with a chain link fence at least 6 ft. high. The fence shall be separated from the tanks by at least 10 ft. and shall have a gate that is secured against unauthorized entry. This requirement applies to:

(i) Tanks at motor fuel dispensing facilities, and

(ii) Tanks at all other facilities that have an individual or aggregate capacity of 12,000 gallons or more.

Exception: Tanks are not required to be enclosed with a fence if the property on which the tanks are located has a perimeter security fence.

(6) Tanks that are unsupervised for any period of time, or are located in isolated/remote areas, shall be secured and shall be marked to identify the fire hazards of the tank and the tank's contents to the general public. Where necessary to protect the tank from tampering or trespassing, the area where the tank is located shall be secured.

(7) For ASTs installed after September 30, 1994, tank supports and foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion to any part of the tank.

3-2-2 Location and Installation

3-2-2-1 Service Stations (Motor Fuel Dispensing Facilities and Repair Garages)

After September 30, 1994, new ASTs may only be installed at service stations if they meet all the general requirements for ASTs, and the service station requirements of this section. After December 22, 1996, tanks designed and built for underground use shall not be used as ASTs. All of the provisions in this section also apply to marine service stations and airport service stations.

(a) For ASTs installed after September 30, 1994, tanks storing Class I and Class II liquids at an individual site shall be limited to a maximum individual capacity of 12,000 gallons and an aggregate capacity of 48,000 gallons unless such tanks are installed in vaults complying with 3-2-2-5, in which case the maximum individual capacity shall be permitted to be 15,000 gallons.

(b) For ASTs installed after September 30, 1994, and before April 14, 2011, tanks shall be located in accordance with Table 1 in this section, except that for secondary containment tanks, "fire tested" tanks, "fire resistant" tanks or tanks installed in a vault, the distance requirement from tank to dispenser is waived, provided that all tanks, pipes and dispensers are satisfactorily protected from vehicular traffic.

(c) For ASTs installed on or after April 14, 2011, ASTs shall be located in accordance with Table 1 below.

TABLE 1	AST Separation at Motor Fuel Dispensing Facilities and Repair Garages					
		Minimum Distance (ft)				
Type of Tank	***Individual Tank Capacity (gal)***	***From Nearest Important Building on the Same Property***	***From Nearest Fuel Dispensing Device***	***From Property Line That Is or Can Be Built Upon Including Opposite Side of Public Way***	***From Nearest Side of Any Public Way***	***Between Tanks***
Tanks in vaults *(measured from vault perimeter)*	0 – 15,000	0	0	0	0	Separate vault compartments for each AST
Protected ASTs (UL 2085)	≤ 6,000	5	0	15	5	3
	6,001 – 12,000	15	0	25	15	3
Fire-resistant ASTs (UL 2080)	0 – 12,000	25	25	50	25	3
Other ASTs meeting NFPA 30 requirements	0 – 12,000	50	50	100	50	3

(d) Bulk Plants with Motor Fuel Dispensing.

This section does not include facilities that meet the requirements of 3-2-2-3.

(1) For facilities existing before April 14, 2011:

(i) ASTs shall meet the location and installation requirements of 3-2-2-4.

(ii) Where the 50 ft distance requirement from tank to dispenser is met, the following shall apply to the ASTs used for both motor fuel dispensing **and** bulk operations:

ASTs storing Class I liquids shall be limited to a maximum individual capacity of 12,000 gallons, ASTs storing Class II liquids shall be limited to a maximum individual capacity of 20,000 gallons, and the aggregate capacity for all tanks shall be 80,000 gallons.

Note: There are no individual or aggregate capacity limits for ASTs used **solely** for bulk operations.

(iii) Where the 50 ft distance requirement from tank to dispenser is not met, the following shall apply to the ASTs used for both motor fuel dispensing **and** bulk operations:

ASTs storing Class I and Class II liquids shall be limited to a maximum individual capacity of 12,000 gallons, and an aggregate capacity of 48,000 gallons.

Note: There are no individual or aggregate capacity limits for ASTs used **solely** for bulk operations.

(2) For new facilities installed on or after April 14, 2011:

(i) ASTs used for motor fuel dispensing shall meet the capacity and location requirements of 3-2-2-1, except that the maximum individual tank capacity of 12,000 gallons, indicated in Table 1, shall be permitted to be increased to 20,000 gallons for Class II liquids, and the aggregate capacity for all tanks shall be 80,000 gallons.

Note: ASTs that are used for motor fuel dispensing shall not be used for bulk operations.

(ii) ASTs used for bulk operations shall meet the location and installation requirements of 3-2-2-4.

Note: ASTs that are used for bulk operations shall not be used for motor fuel dispensing.

(3) ASTs used solely for bulk operations shall not be connected by piping to ASTs or USTs used for motor fuel dispensing, and shall not supply dispensing devices used for motor vehicle fueling.

Exception: Where the total capacity of all ASTs used for motor fuel dispensing and all ASTs used solely for bulk operations is within the aggregate capacities allowed by 3-2-2-1 (d)(1) (ii) or (iii), changes to connected piping are not required.

(4) The motor fuel dispensing operations shall be separated from areas in which bulk plant operations are conducted by a fence or an approved structure (building, retaining wall, etc.), preventing direct access from one area to the other.

3-2-2-2 Governmental, Industrial and Commercial AST Facilities (Fleet Vehicle Motor Fuel Dispensing)

AST installations are permitted at commercial, industrial, governmental, and manufacturing facilities where motor fuels are dispensed into vehicles used in connection with their business by employees, but only under one of the following conditions:

(a) For ASTs installed before April 14, 2011, existing restricted-capacity fleet vehicle motor fuel dispensing operations that meet the following requirements are allowed:

(1) The facility has been inspected and approved by the Director;

(2) No more than two (2) ASTs are in service at the facility;

(3) No AST at the facility has a capacity greater than 6,000 U.S. gallons;

(4) There is not more than one (1) tank at the facility containing Class I liquids; and

(5) The spacing requirements of Table 2 below are met.

TABLE 2	AST Separation at Restricted-Capacity Fleet Motor Fuel Dispensing Facilities (Before April 14, 2011)				
	Minimum Distance (ft)				
Tank Capacity (gal)	***From Nearest Important Building on the Same Property***	***From Nearest Fuel Dispensing Device***	***From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way***	***From Nearest Side of Any Public Way***	***Between Tanks***
660 - 750	5	0	10	5	3
751 – 6,000	5	0	15	5	3

(b) On or after April 14, 2011, new restricted-capacity fleet vehicle motor fuel dispensing operations shall be allowed where the following requirements are met:

(1) The requirements of 3-2-2-2(a)(1) – (4) are met; and

(2) The spacing requirements of Table 3 below are met.

TABLE 3	AST Separation at Restricted-Capacity Fleet Motor Fuel Dispensing Facilities (On or after April 14, 2011)				
	Minimum Distance (ft)				
Tank Capacity (gal)	***From Nearest Important Building on the Same Property***	***From Nearest Fuel Dispensing Device***	***From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way***	***From Nearest Side of Any Public Way***	***Between Tanks***
660 – 2,000	25	0	50	25	3
2,001 - 6,000	25	0	75	35	3

(c) For ASTs installed before April 14, 2011, if the AST system meets the requirements of 3-2-2-1(b) it can operate under the service station capacity allowances.

(d) On or after April 14, 2011, fleet vehicle motor fuel dispensing operations shall be allowed where the following requirements are met:

(1) The spacing requirements of Table 4 below are met.

(i) The maximum individual tank capacity of 12,000 gallons, indicated in Table 4 below, shall be permitted to be increased to 20,000 gallons for Class II and Class III liquids, and the aggregate capacity for all tanks shall be 80,000 gallons; and

(ii) No minimum separation shall be required between the dispensing device and a tank in a vault, a protected aboveground tank, or a fire-resistant tank.

TABLE 4	AST Separation at Fleet Motor Fuel Dispensing Facilities					
		Minimum Distance (ft)				
Type of Tank	***Individual Tank Capacity (gal)***	***From Nearest Important Building on the Same Property***	***From Nearest Fuel Dispensing Device***	***From Property Line That Is or Can Be Built Upon Including Opposite Side of Public Way***	***From Nearest Side of Any Public Way***	***Between Tanks***
Tanks in vaults *(measured from vault perimeter)*	0 – 15,000	0	0	0	0	Separate vault compartments for each AST
Protected ASTs (UL 2085)	≤ 6,000	5	0	15	5	3
	6,001 – 12,000	15	0	25	15	3
Fire-resistant ASTs (UL 2080)	0 – 12,000	25	0	50	25	3
Other ASTs meeting NFPA 30 requirements	0 – 12,000	50	50	100	50	3

3-2-2-3 Unattended Cardlock Systems

(a) On or after April 14, 2011, unattended cardlock systems are those motor fuel dispensing facilities already in existence which are located at bulk plants, governmental, industrial, and commercial facilities where only proprietary cards (or keys) issued by the facility, and that are specific to the facility's fuel management or point of sale system, can be used to dispense fuel. Proprietary cards do not include cards that are available for regional or national fleet fueling.

(1) Cardlock systems installed before October 1, 1994 shall meet the AST separation distances of 3-2-2-4(a).

(2) Cardlock systems installed on October 1, 1994 or thereafter shall meet the AST separation distances of 3-2-2-4(a), and the tank-to-dispenser separation distances of 3-2-2-1(b).

(3) Persons that are issued proprietary cards (or keys) must be knowledgeable in site-specific operating and emergency procedures for dispensing operations.

3-2-2-4 Bulk Plants (And Other Facilities Without Motor Fuel Dispensing)

This section applies to ASTs storing regulated substances, including emergency generator tanks, outdoors at bulk plants and other facilities (except those facilities covered by 3-2-2-1) where there is no motor fuel dispensing.

The following requirements and tables showing required minimum separation distances apply to facilities in this section that store stable liquids in atmospheric ASTs where internal operating pressures do not exceed 2.5 psi. Requirements for the storage of other liquids in other types of ASTs at greater operating pressures are found in NFPA 30, and must be followed.

(a) Every AST which is installed after September 30, 1994 and used for the storage of Class I, Class II, or Class IIIA stable liquids and operating at pressures not in excess of 2.5 psig (17.2 kPa) and designed with a weak roof-to-shell seam, or equipped with emergency venting devices that will

not permit pressures to exceed 2.5 psig (17.2 kPa), shall be located in accordance with Table 5 in this section. Where tank spacing is contingent on a weak roof-to-shell seam design, the user shall present evidence certifying such construction to the Director, upon request.

Exception: Vertical tanks with weak roof-to-shell seams that store Class IIIA liquids shall be permitted to be located at one-half the distances specified in Table 5, provided the tanks are not within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid.

(b) Every AST which is installed after September 30, 1994 and used for the storage of Class I, Class II, or Class IIIA stable liquids and operating at pressures exceeding 2.5 psig (17.2 kPa) or equipped with emergency venting that will permit pressures to exceed 2.5 psig (17.2 kPa), shall be located in accordance with, and meet the requirements of NFPA 30.

(c) Every AST which is installed after September 30, 1994 and used for the storage of liquids with boil-over characteristics shall be located in accordance with, and meet the requirements of NFPA 30.

(d) Every AST which is installed after September 30, 1994 and used for the storage of unstable liquids shall be located in accordance with, and meet the requirements of NFPA 30.

(e) For ASTs installed before April 14, 2011, spacing (Shell-to-Shell) between any two adjacent ASTs, where one AST is installed after September 30, 1994, with tanks storing Class I, II, or IIIA stable liquids shall be separated in accordance with Table 5 in this section.

(f) On or after April 14, 2011, tanks used only for storing Class IIIB liquids shall not be required to be separated by more than 3 ft provided they are not within the same diked area as, or within the drainage path of, a tank storing a Class I or II liquid. If located within the same diked area as, or within the drainage path of, a tank storing a Class I or II liquid, the tank storing Class IIIB liquid shall be spaced in accordance with the requirements for Class IIIA liquids in Table 5.

(g) Every AST which is installed after September 30, 1994 and used for the storage of Class IIIB stable liquids shall be located in accordance with Table 7 in this section.

Exception: If located within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid, the tank storing Class IIIB liquid shall be located in accordance with 3-2-2-4(a).

TABLE 5	Location of Atmospheric ASTs Storing Stable Liquids (Class I, II, IIIA) Internal Pressure Not to Exceed a Gauge Pressure of 2.5 psi			
		Minimum Distance (ft)		
Type of Tank	***Protection***	***From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way***	***From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property***	***Minimum Tank Shell-to-Shell Spacing***
Floating Roof	Protection for exposures	1/2 x tank diameter	1/6 x tank diameter	**Greater of** 1/6 x sum of adjacent tank diameters or 3 ft
	None	Tank diameter	1/6 x tank diameter	
Vertical with weak roof-to-shell seam	Approved foam or inerting system	1/2 x tank diameter	1/6 x tank diameter	**Greater of** 1/6 x sum of adjacent tank diameters or 3 ft
	Protection for exposures	Tank diameter	1/3 x tank diameter	
	None	2 x tank diameter	1/3 x tank diameter	
Horizontal and vertical tanks with emergency relief venting to limit pressures to 2.5 psi	Approved foam or inerting system	1/2 x value in table 6	1/2 x value in table 6	**Greater of** 1/6 x sum of adjacent tank diameters or 3 ft
	Protection for exposures	Value in table 6	Value in table 6	
	None	2 x value in table 6	Value in table 6	
Protected aboveground tank	None	1/2 x value in table 6	1/2 x value in table 6	**Greater of** 1/6 x sum of adjacent tank diameters or 3 ft
In most cases "protection for exposures" will apply.		***Greater of*** *values shown above or 5 ft*		***3 ft min. where sum of adjacent tank diameters is ≤ 18 ft***
PROTECTION FOR EXPOSURES *- Fire protection for structures on property adjacent to liquid storage that is provided by (1) a public fire department or (2) a private fire brigade maintained on the property adjacent to the liquid storage, either of which is capable of providing cooling water streams to protect the property adjacent to the liquid storage.*				

TABLE 6	Distances for Use with Table 5 (Above)	
	Minimum Distance (ft)	
Tank Capacity (gal)	***From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way***	***From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property***
660 - 750	10	5
751 – 12,000	15	5
12,001 – 30,000	20	5
30,001 – 39,999	30	10

TABLE 7	Location of ASTs Storing Class IIIB Liquids	
	Minimum Distance (ft)	
Tank Capacity (gal)	***From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way***	***From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property***
12,000 or less	5	5
12,000 - 30,000	10	5
30,001 - 39,999	10	10

3-2-2-5 ASTs in Vaults

The provisions in this section apply only to ASTs installed after September 30, 1994.

(a) There shall be no openings in the vault enclosure except those necessary for access to, inspection of, and filling, emptying, and venting of the tank. The walls and floor of the vault shall be constructed of reinforced concrete at least 6 inches (15 cm) thick. The top shall be constructed of non-combustible material constructed to be weaker than the walls. The top, floor, and tank foundation shall be designed to withstand the anticipated loading. The vault shall be substantially liquid tight (able to contain the product for enough time until any release therein can be cleaned up) and there shall be no backfill material around the tank. There shall be sufficient space between the tank and vault to allow for inspection of the tank and its appurtenances.

(b) Each vault and its tank shall be suitably anchored to withstand uplifting by groundwater or flooding, including when the tank is empty.

(c) A vault shall be designed to be wind and earthquake resistant in accordance with good engineering practice. The vault shall be resistant to damage from the impact of a motor vehicle, or suitable collision barriers shall be provided.

(d) Each tank shall be in its own vault. Adjacent vaults may share a common wall.

(e) Connections shall be provided to permit venting of each vault to dilute, disperse, and remove any vapors prior to personnel entering the vault.

(f) Vaults that contain tanks of Class I liquids shall be provided with continuous ventilation at a rate of not less than 1 cubic foot per minute per square foot of floor area ($0.3m^3$/min-m^3), but not less than 150 cfm ($4m^3$/min). Failure of the exhaust air flow shall automatically shut down the dispensing system. The exhaust system shall be designed to provide air movement across all parts of the vault floor. Supply and exhaust ducts shall extend to within 3 in. (7.6 cm), but not more than 12 in. (30.5 cm), of the floor. The exhaust system shall be installed in accordance with the provisions of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Materials*. Means shall be provided to automatically detect any flammable vapors and to automatically shut down the dispensing system upon detection of such flammable vapors in the exhaust duct at or above a concentration of 25 percent of the lower flammable limit.

(g) Each vault shall be equipped with a detection system capable of detecting liquids, including water, and of activating an alarm.

(h) Means shall be provided to recover liquid from the vault. If a pump is used to meet this requirement, the pump shall not be permanently installed in the vault. Electric powered portable pumps shall be suitable for use in Class I, Division 1 locations, as defined in NFPA 70, National Electrical Code.

(i) Vent pipes that are provided for normal tank venting shall terminate at least 12 ft. (3.6m) above ground level.

(j) Emergency vents shall be vapor tight and shall be permitted to discharge inside the vault. Long-bolt manhole covers shall not be permitted for this purpose.

(k) Each vault shall be provided with a means for personnel entry. At each entry point, a warning sign indicating the need for procedures for safe entry into confined spaces shall be posted. Each entry point shall be secured against unauthorized entry and vandalism.

(l) Each vault shall be provided with a suitable means to admit a fire suppression agent.

(m) The interior of any vault containing a tank that stores a Class I liquid shall be designated a Class I, Division 1 location, as defined in NFPA 70, *National Electrical Code*.

3-2-2-6 Tanks Inside Buildings

Exception: Tanks storing Class IIIB liquids need not comply with these provisions.

Tanks shall not be permitted inside of buildings unless the storage of liquids in outside aboveground or underground tanks is not practical because of government regulations, temperature considerations or production considerations. Tanks may be permitted inside of buildings or structures only when permitted by the Director and only under the following conditions:

(a) ASTs installed after September 30, 1994 inside buildings shall be permitted only in areas at or above grade that have adequate drainage and are separated from other parts of the building by construction having a fire resistance rating of at least 2 hours. Day tanks, running tanks, and surge tanks are permitted in process areas. Class I, Class II and Class IIIA liquids that may be heated above their flash points shall not be stored in basements. Openings to other rooms or buildings shall be provided with noncombustible liquid tight raised sills or ramps at least 4 in. (10 cm) in height, or the floor in the storage area shall be at least 4 in. (10 cm) below the surrounding floor. As a minimum, each opening shall be provided with a listed, self-closing 1 1/2-hr (B) fire door installed in accordance with the current versions of NFPA 80, *Standard for Fire Doors and Fire Windows*; NFPA 90A *Standard for the Installation of Air Conditioning and Ventilating Systems*, or NFPA 91, *Standard for the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying*. The room shall be constructed without floor drains and with seals between walls and floor of the room in order to contain the product in case of leakage or spillage from the tank.

(1) Secondary containment tanks do not remove the requirement for the raised sills or ramps at openings to other rooms or buildings, or lowered floor requirements described in (a) above. An open-grated trench across the width of the opening inside of the room that drains to a safe location shall be permitted to be used as an alternative to a sill or ramp.

(2) The room shall be liquid tight where the walls join the floor and for at least 4 in. above the floor.

(3) Access aisles of at least 3 ft. width shall be maintained for movement of firefighting personnel and fire protection equipment.

(b) Each connection to a tank inside buildings through which liquid can normally flow shall be provided with an internal or an external valve located as close as practicable to the shell of the tank; and connections for all tank openings shall be liquid tight.

(c) Tanks for storage of Class I or Class II liquids inside buildings shall be provided with either:

(1) A normally closed remotely activated valve,

(2) An automatic-closing heat-activated valve, or

(3) Another approved device on each liquid transfer connection below the liquid level, except for connections used for emergency disposal, to provide for quick cutoff of flow in the event of fire in the vicinity of the tank. This function can be incorporated in the valve required in subsection (b) above and, if a separate valve, shall be located adjacent to the valve required in subsection (b).

(d) Vents for tanks inside of buildings shall be as required in 3-2-1(c), 3-2-1(d), 3-2-2-5, except that emergency venting by the use of weak roof seams on tanks shall not be permitted. Vents shall terminate outside the buildings.

(1) Section 3-2-1(c)(5) requires that adequate ventilation exist to guarantee that flammable liquid vapors cannot build up to 25% percent or more of the lower flammable limit, including inside buildings.

(e) Vent piping shall be constructed and equipped as in 3-2-1(b) and 3-2-1(c).

(f) Openings for manual gauging of Class I or Class II liquids, if independent of the fill pipe, shall be provided with a vapor tight cap or cover. Openings shall be kept closed when not gauging. Each such opening for any liquid shall be protected against liquid overflow and possible vapor release by means of a spring-loaded check valve or other approved device. Substitutes for manual gauging include, but are not limited to, heavy-duty flat gauge glasses, magnetic, hydraulic, or hydrostatic remote reading devices, and sealed float gauges.

(g) The inlet of the fill pipe and the outlet of a vapor recovery line for which connections are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 ft. (1.5 m) away from any building opening. Such connections shall be closed and tight when not in use and shall be properly identified.

(h) Tanks storing Class I, Class II, and Class IIIA liquids inside buildings shall be equipped with a device, or other means shall be provided to prevent overflow into the building. Suitable devices include, but are not limited to, a float valve, a preset meter on the fill line, a valve actuated by the weight of the tank contents, a low head pump incapable of producing overflow, or a liquid tight overflow pipe at least one pipe size larger than the fill pipe, discharging by gravity back to the outside source of liquid or to an approved location.

(i) Tank openings provided for purposes of vapor recovery shall be protected against possible vapor release by means of a spring-loaded check valve or dry-break connections, or other approved device, unless the opening is pipe-connected to a vapor processing system. Openings designed for combined fill and vapor recovery shall also be protected against vapor release unless connection of the liquid delivery line to the fill pipe simultaneously connects the vapor recovery line. All connections shall be vapor tight.

3-2-2-7 Separation from Propane ASTs

(a) The minimum horizontal separation between an LP-Gas container and a Class I, Class II or Class IIIA liquid storage tank installed after September 30, 1994 shall be 20 ft (6 m). When flammable or combustible liquids storage tanks are within a diked area, the LP-Gas containers shall be outside the diked area and at least 10 ft (3 m) away from the centerline of the wall of the diked area. For all tanks, suitable measures shall be taken to prevent the accumulation of Class I, Class II, or Class IIIA liquids under adjacent LP-Gas containers such as by dikes, diversion curbs, or grading.

(b) Subsection (a) shall not apply when LP-Gas containers of 125 gal (475 L) or less capacity are installed adjacent to fuel oil supply tanks of 660 gal (2498 L) or less capacity. No horizontal separation is required between aboveground LP-Gas containers and underground flammable and combustible liquids tanks installed in accordance with UST rules.

3-2-3 Installation, Upgrade, and Repairs

(a) Application for Permit for ASTs

(1) An application must be submitted to and approved by the Director before beginning construction;

(i) On any new or used/reinstalled AST system that will store a regulated substance; or

(ii) Before beginning construction on any existing regulated substance AST system at a facility that is being upgraded to the standards described in these regulations or applicable statutes.

(A) This requirement applies to alterations made to tanks, piping, or equipment affecting their operation, to containment (diking or impounding), and to the security provisions of 3-2-1(i)(5) or (6).

[Note: Where a tank will be moved from and returned to its original location in order to allow an alteration to its containment (e.g., changing from bare earthen diking to lined earth or concrete diking), or where a tank will be moved to a new location outside of its current footprint, a permanent closure must be performed in accordance with 3-4-2, and an application must be submitted for its reinstallation. For tanks installed before October 1, 1994 that will be moved from and returned to their original location, requests for variance from separation requirements of 3-2-2 that cannot be met must be made in writing at the time of application.]

(2) The application must include:

(i) Site Plan - A dimensioned drawing of the facility, showing the name and address of the facility, the location of existing tanks and piping that will remain at the facility, as well as new tanks and piping proposed in the application, the location of dispensers and buildings at the facility, the location of loading/unloading facilities, the location of guard posts and fences, the location of property lines, and the location and names of streets adjacent to the facility; and

(ii) A written application, using the form supplied by the Director, containing information about the proposed construction.

[Note: If a used AST will be installed/reinstalled, the requirements of 3-2-3(d) apply, and the results of the required inspections and testing must be submitted with the application.]

(b) AST Facility Inspections Required

(1) Except in emergencies, if underground piping will be replaced or added to the AST system, the Director must be notified at least 72 hours prior to beginning the air pressure/soap solution test of the piping in order that an inspection of the system may be scheduled at that time. Emergency situations will be dealt with individually by the Director, possibly by delegation of the inspection.

(2) The Director will make an inspection of the AST system, to verify that the facility was constructed according to plan. This inspection will be as detailed as practicable, but does not exempt the owner/operator from certifying that the installation was made according to all the requirements of these regulations. The owner/operator shall provide the Director with a 72 hour notice prior to the filling of the tank system.

(c) Denial or Revocation of Permit

(1) An AST permit application may be denied or revoked if the AST installation or operation is not in conformance with these AST regulations or is not in conformance with all applicable sections of the National Fire Protection Association codes.

(2) An AST permit may be denied or revoked if the AST permit application is not complete or is determined to be inaccurate.

(3) An AST permit may be revoked if the AST installation or operation is not in conformance with the NFPA Codes in effect at the time of installation, and may be revoked for misrepresentation of facts in the application.

(4) An AST permit may be revoked if an inspection by the Director reveals that the construction performed is not in accordance with the installation plan submitted for approval; and may be revoked for failure to meet the operating or fire safety rules established by these regulations or established by the various provisions of the NFPA Codes that apply to the AST facility.

(5) An AST system permit is automatically revoked six months after the date of issue unless the Director grants an extension in writing.

(6) Six months or later, after an AST permit is issued, the permit may be modified by subsequent statutory or regulatory changes.

(d) Reinstallation of ASTs

(1) Used ASTs being installed to store a regulated substance must meet the following requirements:

(i) The AST itself must meet all of the fabrication, construction and performance requirements, and be equipped with all of the required equipment listed in 3-2 of these regulations.

(ii) The tank must be inspected per 3-3-4-2, and manufacturer reinstallation/relocation requirements.

(iii) The AST installation and registration requirements of 3-2-3 and 3-2-4.

(iv) Emergency relief vent devices must be tested and certified to be in good working order.

(e) Upgrading AST Systems

The deadlines for the upgrading of AST systems that existed prior to AST regulations being promulgated have expired. This section remains in this revision for historical reference.

(1) On or before December 22, 1996, AST systems must meet the requirements of these regulations or permanently close the tanks in accordance with these regulations. The following requirements take effect December 22, 1996:

(i) Each AST must be sound and have an emergency relief venting device which is equivalent to those described in these regulations. The owner/operator is required to provide proof that the tank meets this requirement.

(ii) Secondary containment methods or devices must be provided and in regular use at the facility as described in 3-3-1.

(iii) The facility must meet the security requirements of 3-2-1(i).

(2) By December 22, 1998 certain AST systems must be equipped with a solenoid valve or a vacuum-actuated shutoff valve, with a shear section as described in 3-2-1(g).

[Note: In applying these requirements, the following quotation will be carefully considered by the Director - "Existing plants, equipment, buildings, structures, and installations for the storage, handling or use of flammable or combustible liquids that are not in strict compliance with the terms of this code may be continued in use at the discretion of the Director provided they do not constitute a recognized hazard to life or adjoining property. The existence of a situation that might result in an explosion or sudden escalation of a fire, such as inadequate ventilation of confined spaces, lack of adequate emergency

venting of a tank, failure to fireproof the supports of elevated tanks, or lack of drainage or dikes to control spills, may constitute such a hazard."]

(f) Repairs Allowed

(1) If an AST system is damaged, it must be repaired to meet applicable requirements, or be properly closed. Owners/operators of AST systems must ensure that repairs will prevent releases due to structural failure or corrosion as long as the AST system is used to store regulated substances.

(2) The repairs must meet the following requirements:

(i) Repairs to AST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory. [Note: The following codes and standards may be used to comply with this section: National Fire Protection Association Standard 30, "Flammable and Combustible Liquids Code"; American Petroleum Institute Publication 2200, "Repairing Crude Oil, Liquefied Petroleum Gas, and Product Pipelines"];

(ii) Above ground metal pipe that has released product must be immediately repaired or replaced and appropriately tested. [Note: repaired piping that has previously contained flammable liquid must not be subjected to an air pressure test unless the piping has been completely cleaned and rendered vapor free]

(iii) Underground metal pipe sections and fittings connected to an AST that have released product as a result of corrosion or other damage must be replaced immediately and protected from future corrosion. Fiberglass pipes and fittings may be repaired in accordance with the equipment manufacturer's specifications.

(iv) Repaired AST underground piping must be tightness tested in accordance with 2-3-4-3(a)(2)(i) within 30 calendar days following the date of the completion of the repair. New replacement piping runs that have never contained product may be tested by an air pressure/soap bubble test at 1.5 times operating pressure if inspected and approved by the Director.

(3) If a release of regulated substance is identified during repairs to AST system equipment, the owner/operator shall report the release according to Article 4.

3-2-4 AST System Registration and Transfer of Ownership

(a) Registration and Notification for ASTs.

(1) AST Registration Required. All ASTs and facility data must be registered, re-registered or updated on a form provided by the Director, regardless of whether the ASTs and facilities are currently in service or in temporary closure, according to the following provisions:

(i) The registration form must be filled out as completely as possible by the owner/operator of the AST; and must include each tank owned or operated at the facility.

(ii) Owners/operators may provide notice for several tanks at a single facility using one notification form, but owners/operators who own or operate tanks located at more than one facility must file a separate notification form for each separate facility.

(2) Registration Timing. Each owner/operator of an AST must register each AST with the Director as follows:

(i) By July 1, 1993 if the tanks were not registered previously.

(ii) Within 30 calendar days after the first day on which any AST is actually used to contain a regulated substance.

(iii) This registration information must be updated within 30 calendar days after any additional tank construction, AST system upgrading, temporary or permanent closure, or changes in operation including a change of owner or operator, has been completed.

(iv) This registration must be renewed annually during the month designated by the Director, and during the same month in each succeeding year thereafter.

(3) Registration Fee Required. The owner/operator is required to pay an annual registration fee in the amount allowed by the current state law for each regulated tank owned or operated, until the regulated AST is permanently closed as in 3-4-2 or until the owner/operator has instituted a change-in-service to a substance other than a regulated substance as in 3-4-3.

(4) Tank Vendor Responsibility. Any person who sells a tank intended to be used as an AST must notify the purchaser of such tank of the purchaser's registration and registration fee obligations under this section.

Section 3-3 Operation

3-3-1 Spill and Overfill Protection

(a) General Requirements

(1) After December 22, 1996, facilities shall be provided so that any accidental discharge of any Class I, II or IIIA liquids will be prevented from endangering important facilities, and adjoining property, or reaching waterways, as provided for in subsections (b) or (c) except that tanks storing Class IIIB liquids do not require special drainage or diking provisions for fire protection purposes.

(2) Owners/operators of ASTs must ensure that releases due to spilling or overfilling do not occur. The owner/operator must ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made; and that the transfer operation is monitored constantly to prevent overfilling and spilling.

(i) Where electronic or mechanical gauges are used for determining tank volume (ground–level tape gauges, clock face gauges, etc.), the gauge shall be calibrated annually, per manufacturer instructions. These calibrations shall be documented and maintained.

(3) Spill and overfill prevention equipment is required for all ASTs installed after September 30, 1994. Means shall be provided for determining the liquid level in each tank and be accessible to the delivery operator. Specifically, for all ASTs installed after September 30, 1994 at service stations, and for all secondary containment type tanks without diking or impounding protection, the equipment shall automatically stop the delivery of liquid to the tank when the liquid level in the tank reaches 95 percent of capacity or sound an audible alarm when the liquid level in the tank reaches 90 percent of capacity.

(4) Delivery operations shall comply with the following requirements:

(i) The delivery vehicle shall be separated from any AST by at least 25 ft. (7.6 m) for class I liquids and by at least 15 ft. for class II and class III liquids, measured from the nearest fill spout or transfer connection.

(ii) Tank filling shall not begin until the delivery operator has determined tank ullage (available capacity) based on direct liquid level measurement converted to gallons or some equivalent method.

(A) Where spill and overfill prevention equipment that will automatically stop the delivery of liquid to the tank or sound an audible alarm that can be heard by the delivery operator described in 3-3-1-(a)(3) does not exist, tank ullage and the amount of product delivered must be documented and maintained.

(iii) For ASTs installed after September 30, 1994, a check valve and a shutoff valve with a quick-connect coupling or a check valve with a dry-break valve shall be installed in the piping at a point where connection and disconnection is made for delivery from the bulk delivery vehicle to the AST. This device shall be protected from tampering and physical damage.

(5) The owner/operator must report, investigate, and clean up any spills and overfills in accordance with Articles 4 and 5 of these Regulations.

(b) Remote Impounding.

Where protection of adjoining property or waterways is by means of drainage to a remote impounding area, so that impounded liquid will not be held against tanks, such systems shall comply with the following:

(1) A slope of not less than 1 percent away from the tank shall be provided for at least 50 ft. toward the impounding area.

(2) The impounding area shall have a net capacity not less than that of the largest tank that can drain into it plus an allowance for precipitation.

(3) The route of the drainage system shall be so located that, if the liquids in the drainage system are ignited, the fire will not seriously expose tanks or adjoining property.

(4) The confines of the impounding area shall be located so that, when filled to capacity, the liquid level will not be closer than 50 ft. from any property line that can be built upon, or from any tank.

(c) Impounding Around Tanks by Diking

Exception: Size and spacing requirements for dikes enclosing existing ASTs may be reduced or waived by the Director if he determines that there are equivalent safety measures at the facility.

When protection of adjoining property or waterways is by means of impounding by diking around the tanks, such system shall comply with the following:

(1) For ASTs installed after September 30, 1994, a slope of not less than 1 percent away from the tank shall be provided for at least 50 ft. or to the dike base, whichever is less.

(2) After December 22, 1996, the volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank. To allow for volume occupied by tanks, the capacity of the diked area enclosing more than one tank shall be calculated after deducting the volume of the tanks, other than the largest tank, below the height of the dike.

(3) For ASTs installed after September 30, 1994, to permit access, the outside base of the dike at ground level shall be no closer than 10 ft. to any property line that is, or can be, built upon.

(4) After December 22, 1996, walls of the diked area shall be of non-permeable earth, steel, concrete, or solid masonry designed to be liquid tight and to withstand a full hydrostatic head for enough time until any release therein can be cleaned up. For all AST dikes installed after September 30, 1994, the floor of the diked area must be impervious enough to contain the product for enough time until any release therein can be cleaned up. Earthen walls 3 ft. or more in height shall have a flat section at the top not less than 2 ft. wide. The slope of an earthen wall shall be consistent with the angle of repose of the material of which the wall is constructed. Diked areas for tanks containing Class I liquids located in extremely porous soils may require special treatment to prevent seepage of hazardous quantities of liquids to low-lying areas or waterways in case of spills.

(5) Except as provided in subsection (6) below, the walls of the diked area shall be restricted to an average interior height of 6 ft. above interior grade.

(6) Dikes may be higher than an average of 6 ft. above interior grade where provisions are made for normal access and necessary emergency access to tanks, valves, and other equipment, and safe egress from the diked enclosure.

(i) Where the average height of the dike containing Class I liquids is over 12 ft high, measured from interior grade, or where the distance between any tank and the top inside edge of the dike wall is less than the height of the dike, provisions shall be made for normal operation of valves and access to tank roof without entering below the top of the dike. These provisions may be met through the use of remote-operated valves, elevated walkways, etc.

(ii) Piping passing through dike walls shall be designed to prevent excessive stresses as a result of settlement or fire exposure.

(iii) For ASTs installed after September 30, 1994, the minimum distance between tanks and toe of interior dike walls shall be 5 ft.

(7) Where provision is made for draining water from diked areas, such drains shall be controlled in a manner so as to prevent flammable or combustible liquids from entering natural water courses, public sewers, or public drains. Control of drainage shall be accessible under fire conditions from outside the dike.

(8) Storage of combustible materials, empty or full drums, or barrels, shall not be permitted within the diked area.

(d) Secondary Containment Tanks may be installed without special drainage or diking if they are constructed to meet all the following requirements:

(1) The capacity of the tank shall not exceed 12,000 gallons for Class I liquids or 20,000 gallons for Class II and IIIA liquids; and

(2) All piping connections to the tank are made above the normal maximum liquid level; and

(3) Means are provided to prevent the release of liquid from the tank by siphon flow; and

(4) The outer tank must contain a release from any portion of the inner tank within the outer wall; and

(5) For ASTs installed after September 30, 1994, spacing between adjacent tanks shall be not less than three (3) feet (0.9 M); and

(6) Tanks that are not listed as UL 2085 Protected Tanks must be protected from collisions as described in 3-2-1(i); and

(7) The system must prevent spills by being equipped with:

(i) A check valve and a shutoff valve with a quick-connect coupling or a check valve with a dry-break valve which is installed in the piping at a point where connection and disconnection is made for delivery from the vehicle to any AST; or

(ii) If the delivery hose is connected directly to the tank, the fill line at the tank shall be equipped with a tight-fill device for connecting the hose to the tank to prevent or contain any spill at the fill opening during delivery operations; and

(8) ASTs must prevent overfills by means of equipment that will shut off liquid flow to the tank when the liquid level in the tank reaches 95% of capacity or sound an audible alarm when the liquid level in the tank reaches 90% of capacity.

(e) Secondary containment areas must be maintained free of accumulations of water, leaves, weeds, flammable material, non U.L. listed tanks or drums, and anything else that might interfere with the containment purpose of such areas.

3-3-2 Corrosion Protection

(a) Internal Corrosion Protection For ASTs Installed After September 30, 1994.

When ASTs installed after September 30, 1994, are not designed in accordance with the American Petroleum Institute, American Society of Mechanical Engineers, or the Underwriters Laboratories Inc. Standards, or if corrosion is anticipated beyond that provided for in the design formulas used, additional metal thickness or suitable protective coatings or linings shall be provided to compensate for the corrosion loss expected during the design life of the tank.

(b) External Corrosion Protection for ASTs installed after September 30, 1994.

For those portions of an AST system installed after September 30, 1994, including the product pipelines that normally contain regulated substances and are in contact with the soil or with an electrolyte that may cause corrosion of the AST system, tanks and piping must be protected by either:

(1) A properly engineered, installed and maintained cathodic protection system in accordance with recognized standards of design, such as:

(i) National Association of Corrosion Engineers Standard RP-01-69, *"Control of External Corrosion of Underground or Submerged Metallic Piping Systems"* ;

(ii) National Association of Corrosion Engineers Standard RP-02-85 *,"Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems"* ; or;

(2) Approved or listed corrosion-resistant materials or systems, which may include special alloys, fiberglass reinforced plastic, or fiberglass reinforced plastic coatings.

(c) External Coating of all Elevated Tanks.

For installations where tanks and piping are not in contact with soil or with an electrolyte, corrosion protection may consist of an appropriate external coating.

(d) Cathodic Protection Requirements.

Owners/operators must comply with the following requirements to ensure that releases due to corrosion are prevented for as long as a cathodically protected AST system is used to store regulated substances:

(1) All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.

(2) Performance criteria - The criteria that are used to determine that cathodic protection is adequate as required by this section must be in accordance with a code of practice developed by a nationally recognized association.

(3) Periodic Inspections - AST systems with impressed current cathodic protection systems must be inspected every 60 calendar days to ensure that the equipment is running properly.

(e) Tanks that are not cathodically protected must be tested within 5 years after October 1, 1994; and once every two years thereafter by either;

(1) An external visual inspection, that includes the bottom of the tank, for corrosion or other visible damage; or

(2) A leakage test of any type approved by the Director; or

(3) An internal inspection for corrosion or other visible damage; or

(4) Comply with some other alternative test for corrosion or leakage as specified by and approved by the Director in the future.

3-3-3 Release Detection

(a) General Requirements for all AST Systems.

(1) ASTs that are not in contact with the ground or any electrolyte that might cause corrosion of the tank must be visually inspected at least once per month by operating personnel to detect any leakage from tank seams, connections, and fittings, including piping. Any such leakage must be repaired immediately and reported under the repair and reporting requirements of these regulations.

(2) ASTs, including metal supporting structures, that are in contact with the soil or that are in contact with an electrolyte that may promote corrosion of the tank must be inspected as in subsection (1) above and be protected from corrosion or tested periodically to prove that they are not seriously corroded, as described in 3-3-2(e).

(3) AST system piping that is not in contact with the soil or with an electrolyte that might cause corrosion of the piping must be inspected at least once each month to detect leakage from pipe seams, connections, and fittings. Any such leakage that may exceed the reportable quantity (25 gallons) must be repaired immediately and reported as in Article 4.

(4) Underground AST piping shall meet the release detection requirements in 2-3-4-3.

(i) Pressurized piping described in 3-2-1 (g)(1)(i) shall meet the release detection requirements (automatic leak detector and line tightness testing) in 2-3-4-3(a), except that where there is no pump installed between the tank and underground piping, the requirement for an automatic line leak detector in 2-3-4-3(a)(1) does not apply.

(ii) Suction piping described in 3-2-1(g)(1)(A) shall meet the release detection requirements in 2-3-4-3(b).

(5) Inventory control shall be performed and documented for all single-wall ASTs installed on earthen materials, and all ASTs connected to underground pressurized piping that is not being monitored for releases in accordance with 2-3-4-3(a)(2)(ii). Accurate daily inventory records shall be maintained and reconciled for all applicable storage tanks.

(b) Release Detection for Secondary Containment Tanks

Secondary Containment tanks that are installed without special drainage or diking according to 3-3-1(b) or (c) must be visually inspected at least once each month to ensure that there has been no failure of the outer wall of the secondary containment tank. An interstitial liquid detector or some other positive means of leak detection must be installed to detect leaks from the inner wall of the tank; and operation of that leak detector must be verified at least monthly. A record of the inspection must be maintained [See § 3-3-5].

(c) All AST system tank and piping fittings, connections, valves, auxiliary equipment that contains product, secondary containment areas, etc. must be maintained free of obstructions that would interfere with visual detection of leaks and spills.

3-3-4 Testing and Compliance Inspections

3-3-4-1 Testing

(a) Initial Testing

(1) All new ASTs shall be tested before they are placed in service in accordance with the requirements of the standard or code under which they were built.

(i) An AST marked with an approved listing is considered to be in compliance with this requirement, as the testing is part of the standard to which it was constructed. Tanks not marked with an approved listing shall be tested before they are placed in service in accordance with recognized engineering standards.

(b) Tightness Testing

(1) In addition to the initial testing of 3-3-4-1(a), all new and used tanks and connections shall be tested for tightness after installation/reinstallation and before being placed in service in accordance with manufacturer instructions, or NFPA 30 where no manufacturer instructions exist. This test shall be made at operating pressure with air, inert gas, or water.

(i) Air pressure shall not be used to test tanks that contain flammable or combustible liquids or vapors.

(ii) Where the vertical length of the fill and vent pipes is such that, when filled with liquid, the static head imposed on the bottom of the AST exceeds a gauge pressure of 10 psi, the tank and its related piping shall be tested hydrostatically to a pressure equal to the static head, using recognized engineering standards. Under no circumstances should the test pressure exceed the design pressure of the AST.

3-3-4-2 Inspections

(a) All steel ASTs shall be inspected and maintained in accordance with STI SP001, *Standard for the Inspection of Aboveground Storage Tanks*, or API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*, whichever is applicable.

(b) Monthly Visual Inspections

The owner/operator must conduct visual inspections of the tank system each month and document the results of the inspection on a form provided by the Director or on an equivalent form. These monthly visual inspections satisfy the requirements described in 3-3-3 (a)(1) through (3).

(c) Annual Visual Inspections

(1) Annual inspections of all steel ASTs shall be performed, documented, and retained according to the requirements of STI SP001.

(i) This inspection does not include ultrasonic testing (UT), and can be performed by an individual knowledgeable of storage facility operations, the type of AST and its associated components, and characteristics of the liquid stored.

(ii) Annual inspections shall be performed within 12 months after April 14, 2011, and during the same month in each year thereafter.

(d) Periodic Inspections

(1) External and internal inspections, and leak testing, shall be performed and documented according to the requirements of the standard being followed.

(i) These inspections shall be performed by inspectors meeting the qualifications required by the standard being followed.

(ii) The applicability and frequency of these inspections is determined by the AST type, capacity, type of installation, corrosion rate, inspection history, and standard being followed according to guidance provided by OPS.

(iii) For any new or used AST being installed, and all existing ASTs, the first inspections and testing required by this subsection are due as indicated in Table 8 below.

[Note: For Table 8, inspection frequency shall be determined based on the requirements in the selected inspection standard listed in (c)(1).]

TABLE 8	First External and Internal Inspections, and Leak Testing Due			
Type of AST	***Age of AST***	***Previous inspections conducted?***	***Re-inspection due date is exceeded ?***	***The inspection is due***
AST Installations: New	at the time of installation is **new**	No	N/A	when the age of the AST = the inspection frequency
AST Installations: Used	at the time of installation is ≤ the inspection frequency	Yes	Yes	before installation **
AST Installations: Used	at the time of installation is ≤ the inspection frequency	Yes **	No	re-inspect per subsection (iv) below
AST Installations: Used	at the time of installation is ≤ the inspection frequency	No	N/A	when the age of the AST = the inspection frequency
AST Installations: Used	at the time of installation is > the inspection frequency	Yes	Yes	before installation **
AST Installations: Used	at the time of installation is > the inspection frequency	Yes **	No	re-inspect per subsection (iv) below
AST Installations: Used	at the time of installation is > the inspection frequency	No	N/A	before installation **
Existing	on 10/14/2012 is ≤ the inspection frequency	Yes	Yes	before 10/14/2012
Existing	on 10/14/2012 is ≤ the inspection frequency	Yes	No	re-inspect per subsection (iv) below
Existing	on 10/14/2012 is ≤ the inspection frequency	No	N/A	when the age of the AST = the inspection frequency
Existing	on 10/14/2012 is > the inspection frequency	Yes	Yes	before 10/14/2012
Existing	on 10/14/2012 is > the inspection frequency	Yes	No	re-inspect per subsection (iv) below
Existing	on 10/14/2012 is > the inspection frequency	No	N/A	before 10/14/2012

****A copy of the inspection report must be included with the installation application required by 3-2-3(a).**

(iv) Re-inspection of all ASTs shall occur in the same month as the previous inspection, during the next inspection year established by the applicable inspection frequency.

(e) The Director shall have authority to enter in or upon the premises of any facility that contains an AST system containing a regulated substance, for the purpose of verifying that such AST system and its required records are in compliance with these regulations.

3-3-5 Record Keeping

(a) Owners/operators must maintain the following records for an AST site as applicable:

(1) Installation permits for newly installed tanks, reinstalled used tanks or permits for upgrading existing tanks must be maintained for 5 years.

(2) Tank registration records or record of facility ID number retained until closure.

(3) Records of repairs that have been performed within the last 5 years.

(4) Monthly and annual visual inspection records of the AST system must be kept for one year. Formal inspection reports and supporting documents shall be retained for the life of the tank.

(5) Most recent underground piping precision test records must be maintained.

(6) Records showing the history of each AST in terms of which Class and type of product has been stored in that tank, shall be maintained for at least one year.

(7) Electronic/mechanical tank gauge calibration documentation required by 3-3-1(a)(2)(i) must be kept for one year.

(8) Tank ullage documentation required by 3-3-1(a)(4)(ii)(A) must be kept for one year.

(9) Inventory control records required by 3-3-3(a)(5) must be kept for one year.

(10) Free product removal records must be maintained to document proper operation following any release of product within the last five years.

(11) Records showing the changes in status of tanks that have been temporarily closed at times then returned to service, should be maintained for at least two (2) years. Records need not be kept for tanks that have been permanently closed.

(12) Records of the operation of the cathodic protection system including results of 60-day inspection as required in 3-3-2 (d)(3).

(b) Records must be maintained at the AST site and immediately available for inspection by the Director; or at a readily available alternative site and be provided for inspection within 24 hours to the Director upon request.

(c) Notwithstanding the above, to be eligible for the Fund, persons may be required to maintain the above or other records in accordance with Fund requirements.

Section 3-4 Closure of AST Systems

3-4-1 Temporary Closure

(a) Owners/operators shall notify the Director in writing at least 10 calendar days prior to placing an AST system in temporary closure, and at that same time submit records documenting the prior 12 months of monthly visual inspections, inventory control, ullage records, piping release detection records, and corrosion protection testing (if applicable) for tanks and piping. In lieu of submitting these records, the owner/operator may conduct a tightness test of the tanks and underground piping, and complete a site assessment as required by the Director, and submit these results with the temporary closure notification.

(b) Temporarily closed tanks must be emptied of liquid, rendered vapor free and safeguarded against trespassing by means of locked gates, fences etc. When an AST system is temporarily closed, owners/operators must continue the operation, maintenance, inspection, and testing of corrosion protection in accordance with these regulations. Because the tanks must be emptied, release detection is not required.

(c) When an AST system is temporarily closed, vent lines must be left open and functioning. If the temporary closure period is 3 months or more, all pumps, manways, ancillary equipment and lines other than vent lines must be capped and secured, unless an alternate schedule is approved by the Director.

(d) When an AST system is temporarily closed for more than 12 months, owners/operators must permanently close the AST system in accordance with 3-4-2, unless the Director provides a written extension of the 12-month temporary closure period. Before requesting this extension, owners/operators must complete a site assessment as required by the Director.

(e) Owner/operators shall notify the Director in writing no more than 30 calendar days prior to placing an AST back in service, and at that same time submit corrosion protection records (if applicable) for the period of temporary closure, and documentation of passing tightness tests for the AST conducted within the past 30 calendar days. The owner/operator shall obtain passing tightness tests for underground lines immediately upon introduction of fuel into the lines and submit documentation of testing to the Director within 10 calendar days.

(f) If an owner/operator operates a facility which has a specific period of time or season during the year when the tank system is empty, as described in (b) of this section, the requirements for maintaining corrosion protection and the following requirements below will apply:

(1) The owner/operator shall notify the Director that the facility does include seasonal operation on a form provided by the Director. If this information changes, the owner/operator shall complete and submit the form to the Director.

(2) The period may not exceed 6 consecutive months.

(3) The owner/operator shall maintain manifest documentation completed during emptying of the tank.

(4) At the end of the seasonal period, the owner/operator must conduct one of the following actions:

(i) Return the tank to service.

(ii) Place the tank into proper temporary closure. The owner/operator must notify the Director in writing within 10 calendar days, submit records according to (a) as applicable and complete requirements in (c) immediately.

(iii) Permanently close the tank as required by 3-4-2.

3-4-2 Permanent Closure

(a) Owners/operators shall notify the Director in writing at least 10 calendar days prior to placing an AST system in permanent closure, and at that same time submit records documenting the prior 12 months of monthly visual inspections, inventory control, ullage records, piping release detection records, and corrosion protection testing (if applicable) for tanks and piping.

Exception: Records do not need to be submitted where they have already been submitted as part of placing the tank into temporary closure as required by 3-4-1.

(b) Empty and clean the tank by removing all liquids and accumulated sludges as described in 3-4-5; and

(c) Clean out and plug both ends of all connected piping; and

(d) Remove all dispensers; and

(e) Render all connected loading facilities completely inoperative; and

(f) Safeguard the AST system from trespassing as described in 3-4-1, or remove the tanks from the facility; and

3-4-3 Change in Service

(a) Continued use of an AST system to store a substance other than a regulated substance is considered a change-in-service. Before a change-in-service, owners/operators must empty and clean the tank, connected piping, and any other equipment that previously contained a regulated substance as described in 3-4-5; then notify the Director in writing of the change of service.

3-4-4 Site Assessment

(a) Before an extension to temporary closure, permanent closure or a change-in-service is completed, or upon request by the Director for previously closed sites, owners/operators must measure for the presence of a release where contamination is most likely to be present at the site. In selecting sample types, sample locations, and measurement methods, owners/operators must consider the method of closure, the nature of the stored substance, the depth to groundwater, and other factors appropriate for identifying the presence of a release.

(1) For assessments when the tank system is removed during permanent closure, the owner/operator must collect soil samples from beneath each tank, beneath each dispenser island, beneath areas of piping, and beneath any loading racks.

(2) For assessments when the tank system is left in-place during permanent closure, prior to placing the tank into temporary closure, or when there is a change-in-service, the owner/operator shall collect samples of the type and at locations as specified by the Director. Samples collected at all sites must be analyzed for individual chemicals of concern (COC) as described in 5-2.

(b) If contaminated soils, contaminated groundwater, or free product as a liquid or vapor is discovered, owners/operators must report a release in accordance with Article 4.

(c) If the tank closure assessment does not identify a release, the owner/operator must submit documentation of the assessment to the Director within 30 calendar days of the tank closure.

[Note 1: Permanently closed or non-regulated ASTs may be returned to active regulated substance service only after meeting the reinstallation rules described in 3-2-3(d).]

[Note 2: These closure rules are the minimum required in Colorado; they do not preempt local fire district rules, local building codes, or local zoning rules. In fire districts where the Uniform Fire Code is in effect, the fire district may require that temporarily closed ASTs be removed or demolished.]

[Note 3: The following procedures may be used to comply with 3-4:

(A) American Petroleum Institute Publication 2015,"*Cleaning Petroleum Storage Tanks"* ;

(B) American Petroleum Institute Publ. 2015A, *"Lead Hazard Associated with Tank Entry"* ;

(C) American Petroleum Institute 2015B*,"Cleaning Open Top and Floating Roof Tanks"* ;

(D) National Institute for Occupational Safety and Health *"Criteria for a Recommended Standard...Working in Confined Space"* may be used as guidance for conducting safe closures.]

3-4-5 Waste Handling

(a) All liquids and accumulated sludges must be removed and disposed of according to the rules adopted pursuant to the Solid Waste Disposal Regulations and the Colorado Hazardous Waste Regulations adopted by the Colorado Department of Public Health and Environment.

Section 3-5 Oil Pollution Prevention - SPCC Plan

The US EPA's SPCC rule regulates non-transportation-related onshore and offshore facilities that could reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines. It is the responsibility of the facility owner/operator to make the determination whether the facility is subject to the requirements of the SPCC rule. This determination is subject to review by the EPA's Regional Administrator. All requests for information regarding SPCC should be directed to the US EPA.

Compliance with the US EPA's SPCC rule is required. Documentation used to demonstrate compliance with the US EPA's SPCC rule may be used to demonstrate compliance with this section.