

BUREAU OF STANDARDS

Effective Date: 8/19/2016

Section No. 4

Version: 1.2

Procedure No. 3

TITLE: LP Gas Bulk Plant Final Inspection

PURPOSE: This document details the procedures used to conduct a Final Inspection of a Liquefied Petroleum Gas Bulk Plant facility. Per Chapter 527.0605 Florida Statute, the Final Inspection is required prior to the installer placing container in operation.

The standard for installation and maintenance at a bulk facility is covered in Chapter 527 Florida Statute, Rule 5J-20 Florida Administrative Code and NFPA 58, 2011 edition as adopted by Rule 5J-20.002 Florida Administrative Code. All data and observations are recorded on the inspection worksheet.

1.0 Pre-Inspection/Document Review

1.1 Follow **Procedure 1.2 Approach and Contact** regarding the facility.

1.2 Ask if a manager or supervisor is available to review your findings at the close of the inspections.

NOTE: In the instance of a Dealer Remote Storage or Consumer Storage it is not uncommon for no one to be on site

1.3 View all available license(s) as applicable.

1.3.1 License Type to cover scope of the operation

1.3.2 Available license shall be current

NOTE: If the final inspection is being conducted prior to the issue of a new license or the final inspection is being conducted at a non licensed facility this step would be eliminated.

1.4 Verify master qualifier and qualifiers are attached to the license

1.4.1 Confirm the Master Qualifier is employed at the location and qualifier status is current

1.4.2 Confirm each additional Qualifier listed is employed at the location and qualifier status is current

1.4.3 Confirm the number of employees involved in liquid transfer, service, plant operations and sales—

1.4.3.1 Verify 1 qualifier for each 10 employees is assigned to the license; Master Qualifier counts as 1.

1.5 Review documented training for liquid transfer, service and plant personnel.

1.5.1 Documentation shall include the Employees position and description

1.5.2 Training reflected in documentation of training to include the scope of the employee's job description.

1.5.3 If employees are employed for more than 3 years, confirm refresher training minimum 3 year intervals and all training is documented.

1.5.4 Confirm training is documented in accordance with Rule 5J-20.060, F.A.C.

1.6 Review Security Awareness Training and Plan

1.7 Where the installation consist of aggregate water capacity of more than 4,000 gallons (Water Gallons) a fire safety analysis is required. Review fire safety analysis to insure the document is prepared in accordance with NFPA 58 6.25.3.

1.8 Review Operations and Maintenance Manuals for completion

1.8.1 Multiple containers in vapor service only, with individual water capacity not exceeding 1200 gallons and with a maximum aggregate of 6000 not manifolded together are exempt from this requirement

1.8.2 Operations Manual shall be prepared in accordance with NFPA 58 14.2.1

1.8.3 Maintenance Manuals shall be prepared in accordance with NFPA 58 14.3.2

1.8.4 Maintenance of Fire Protection Equipment shall be in accordance with NFPA 58 14.3.3

2.0 Plant Security

2.1 Observe emergency contact information is prominently posted.

NOTE: Signage may be posted on the entrance of the business or at the entrance into the plant.

2.1.1 Phone number to be easily readable.

2.1.2 4 inch letter height minimum.

2.2 Verify entrance into bulk facility is secured if unattended.

2.3 Verify fencing is a minimum 6 foot fence with 2 means of egress.

2.4 Loading risers and or bulk heads must be at least 3 feet from the means of egress.

3.0 Plant Yard

3.1 Each plant is required to have a minimum 18 pound B:C rated fire extinguisher to be located within 50 feet and accessible from all points of transfer.

NOTE: Fire extinguishers having more than one letter classification with the B: C rating included are acceptable.

3.1.1 Visually inspect the fire extinguisher to insure it is fully charged.

3.1.2 Verify on the inspection tag that the annual inspection has been conducted.

3.2 Look for loose or piled combustible materials and verify it is not within 10 feet of containers in service.

3.3 Observe any overhead power lines within 6 feet of a vertical plane of the containers in service. Verify the voltage does not exceed 600 volts.

NOTE: If the voltage cannot be confirmed by visual certification, the license holder can typically obtain confirmation from the servicing power company.

3.4 Locate areas in the plant where electrical equipment including switches, light fixtures, outlets and equipment is installed.

3.4.1 Confirm all electrical wiring and equipment within the classified areas are in compliant with NFPA 58 6.22.

- 3.5 Observe the location of the container in reference to the buildings, other installed containers and property lines to confirm distances are compliant with NFPA 58 6.3.1 and Table 6.3.1.
- 3.6 If operations are normally conducted during evening hours, verify lighting is provided to properly illuminate the containers, containers being loaded, control valves and other equipment.

4.0 Container

- 4.1 Confirm data plate is visible, legible and attached directly to the container.

NOTE: The data plate is typically attached to end of the container or on the top of the container in the area where the container appurtenances are located.

- 4.2 Visibly inspect the data plate to confirm the information reflected is clearly legible.
- 4.3 Verify the container is fitted with a fixed maximum liquid level gauging device in compliant with NFPA 58 5.7.5.
- 4.4 Visually inspect to confirm container openings are fitted with internal valves or flow control in compliant with NFPA 58 5.7.4.2.
- 4.5 For containers over 4,000 gallons:
 - 4.5.1 Verify the container is fitted with a pressure and temperature gauge.
 - 4.5.2 Inspect the Internal liquid valves to verify they are equipment with the following:
 - 4.5.2.1 Internal valves are installed in accordance with NFPA 58 5.7.4.2 and Table 5.7.4.2.
 - 4.5.2.2 Automatic shutdown of the internal valves in liquid service is provided using thermal (fire) actuation.
 - 4.5.2.3 The thermal sensing element of the internal valve is within 5 ft of the internal valve.
 - 4.5.2.3.1 A Remote Shut-down station is installed no less than 25 ft or more than 100 ft from the liquid transfer point.
 - 4.5.2.3.2 Remote shut down station is identified by a sign visible from the point of transfer.
 - 4.5.2.3.3 The verbiage of the signage incorporates the words “Propane— Container Liquid Valve Emergency Shut-Off” in at least 2” block letters with contrasting background.
 - 4.5.2.4 Test the Internal valve for operation.
 - 4.5.2.4.1 Where the valves are in the open position and operations are not being conducted, test the valve for operation.
 - 4.5.2.4.2 At the remote shut-down station, follow the instructions to close the valve.

NOTE: Valves should begin to close within 1 minute. Where multiple container valves, once the first valve closes the remaining valves will close in a domino type effect.
 - 4.5.2.4.3 Leave the valve in the closed position.

4.6 Inspection of Shut Off Valves

4.6.1 Observe the location of shut off valves to insure they are as close as practical to the container in combination with flow controls

4.6.2 Verify the shut off valves are accessible for normal & emergency operation.

NOTE: Where the valves are not fitted for remote closure and are 6 feet or greater from ground level, extension handles, ladders, stairs or platforms may be used to access the valves, but must be on location and set up to render the valves accessible.

4.7 Inspect the container relief valves

4.7.1 Confirm start-to-leak pressure, relieving capacity in SCFM air, manufacturer's name and catalog number.

4.7.2 Confirm rain caps are in place.

4.7.3 Verify the valves are unobstructed and directed upward into the atmosphere

4.7.4 Visibly inspect the drain openings to confirm they are clear and directed away from adjacent containers, piping or other equipment

4.7.5 Visibly inspect discharge piping where utilized to confirm its in compliance with NFPA 58 6.7.2.14

4.8 Visibly inspect the container surface to insure it is properly painted (a light reflected coating) and does not show signs of corrosion, pitting, or other shell damage which may compromise the integrity of the container wall.

4.8.1 If pitting is observed measure and compare pits to the thickness listed on the tank data plate and note on the inspection worksheet.

4.9 Visually inspect the welds of the container for corrosion, pitting or other damage that may compromise the integrity of the weld.

4.10 Visually inspect container legs or foot ring for damage that will affect the ability to securely support the container at full capacity in the position in which it is designed to be installed. Inspection of this area of the container should include:

4.10.1 Observations of corrosion which have affected the integrity of the supports

4.10.2 Damage to the welds connecting the supports to the container

4.10.3 Visible damage which have changed the configuration or design in which the supports were attached to the container such as bent or flattened supports.

4.11 If containers are placed on skids, concrete saddles or other supports that are in contact with the container shell, visually inspect the container surface and supports for damage or defects. Inspection of this area of the container should include:

4.11.1 If the container support is constructed of metal, the support shall be inspected for rust, corrosion or other damage that will affect its' ability to securely support the container at full capacity.

4.11.2 If the container support is constructed of concrete, the support shall be inspected for cracks, chips, deterioration or other damage that will affect its ability to securely support the container at full capacity.

4.11.3 Visibly inspect the pads or coating on the masonry saddles to insure there is no deterioration of either.

- 4.11.4 Visibly inspect the containers surface in the area of contact with the support for rust and or corrosion

NOTE: ASME and DOT containers constructed of steel are more susceptible to rust and corrosion where the container surface comes in contact with concrete saddle and therefore a protective coating or padding is required on this section of the container. The most common method of protection is padding. Over time the padding will deteriorate. The combination of air and moisture in contact with the area will ultimately result in corrosion which is not always readily visible.

5.0 Piping System

- 5.1 Piping, Tubing and Valves shall be steel, brass, copper, malleable or ductile iron. No cast iron may be used. Brazing filling material has a melting point that exceeds 1000 °F.

- 5.2 The minimum service pressure ratings are in Table 1 below:

Table 1	
Service	Minimum Pressure
Higher than container pressure	350 psig (2.4 MPag) or the MAWP, whichever is higher, or 400 psig (2.8 MPag) WOG rating
Lp-Gas Liquid or vapor at operating pressure over 125 psig (0.9 MPag) and at or below container pressure	250 psig (1.7 MPag)
LP-Gas vapor at operating pressure of 125 psig (0.9 MPag) or less	125 psig (0.9 MPag)

- 5.3 Verify the piping installed meets the required rating in Table 2 below:

Table 2		
Service	Schedule 40	Schedule 80
Liquid	Welded or brazed	Threaded, welded or brazed
Vapor $\leq$ 125 psig ($\leq$ 0.9 MPag)	Threaded, welded or brazed	Threaded, welded or brazed
Vapor $\geq$ 125 psig ($\geq$ 0.9 MPag)	Welded or brazed	Threaded, welded or brazed

- 5.4 Verify piping is installed to allow for expansion, contraction, jarring, vibration and settling.

- 5.5 If hoses and flex connectors are used, they shall comply with NFPA 58 5.9.6 specifications.

- 5.5.1 Flexible metallic connectors shall not exceed 5 feet in overall length when used with liquid or vapor piping on stationary container of 2,000 gallons or less.

- 5.5.2 If flexible metallic connectors are used to prevent excessive strain on the pump, verify the flexible connectors do not exceed 36 inches in over length.

- 5.6 Visually inspect for observations of rust, corrosion or damage which will affect integrity of the piping system.

- 5.6.1 If piping supports are installed—inspect for corrosion where the pipe is in contact with the support.
- 5.7 Verify aboveground piping is supported and protected against vehicular damage
- 5.8 Inspect pipe color coding in compliance with Rule 5J-20.025, F.A.C.
 - 5.8.1 Color coding within 30 inches each side of all shut off valves:
 - 5.8.1.1 Liquid valves Red
 - 5.8.1.2 Vapor valves Yellow
 - 5.8.1.3 Water valves Blue
- 5.9 Inspect piping for leakage in accordance with the departments adopted procedure for the detection of leaks.
- 5.10 Verify a Hydrostatic relief valve is installed in the liquid line or hose where liquid can be isolated in a line between shut off valves.
NOTE: The hydrostatic relief valve is designed and installed to relieve pressure that could develop from the trapped liquid.

- 5.10.1 Confirm the rating of the hydrostatic relief valve is in compliance with NFPA 58 5.13.
- 5.11 Visually inspect strainers installed to verify they allow for the removal of the strainer element without removing equipment or piping.
- 5.12 Verify installation of compressors meets NFPA 58 6.17.3.
- 5.13 Visually inspect pump installations.
 - 5.13.1 Confirm they are installed as not to subject the pump assembly to excessive strains transmitted to it by the suction and discharge piping.
 - 5.13.2 Verify flexible metallic connectors used in this application do not exceed 36 inches in overall length.
 - 5.13.3 Verify the pump operating control switch is located near the pump.

6.0 Liquid transfer areas (bulk truck and transport):

- 6.1 Inspect bulkhead installation to insure the emergency shut off valves (ESV) or backflow check valve are installed in the fixed piping so any break resulting from a pull away will occur on the hose or swivel-type piping side of the connection leaving the valves and piping on the plant side connection intact.
- 6.2 Verify an emergency shutoff valve is installed in the transfer lines of the fixed piping transfer system within 20 ft of the lineal pipe from the nearest end of the hose or swivel type piping connections.
- 6.3 Inspect ESV and remote actuators for the following:
 - 6.3.1 Valves are clearly identified.
 - 6.3.2 Remote actuators are accessible and located a minimum 25 ft to maximum 100 ft in a path of egress from the valve.
 - 6.3.3 Are not operated with the use of propane.
 - 6.3.4 Verify a temperature sensitive elements is used to actuate the valve in case of emergency.
 - 6.3.4.1 Where a supplemental temperature-sensitive element is used that is not part of the valve, verify it meets the following:
 - 6.3.4.1.1 Operates at maximum temperature of 250 °F

6.3.4.1.2 Connected to the valve within 5 ft of the nearest hose end or swivel-type piping connected to the line in which the valve is installed.

6.3.4.1.3 The element is not painted or coated with any finish after manufacture.

6.3.5 Inspect ESV pneumatic operation and check for forced open inoperable ESV valves.

NOTE: This would be objects or mechanisms in place to forcibly hold the ESV in the open position which would have to be manually removed for the ESV to close.

6.4 Inspect the Hoses

6.4.1 Verify approval for application per NFPA 58 5.9.6.

6.4.2 Inspect Hoses and assembly for the following:

6.4.2.1 Damage to outer cover that exposes reinforcement.

6.4.2.2 Kinked or flattened hose.

6.4.2.3 Soft spots or bulges in the hose.

6.4.2.4 Couplings that have slipped on the hose, are damaged, missing parts, or loose bolts.

6.4.2.5 Leakage other than permeability leakage.

6.5 Verify electrical equipment & switches within the classified area are in compliant with NFPA 58 6.22.

6.6 Confirm containers in storage other than those awaiting refill are a minimum 10 feet from the point of transfer.

7.0 Cylinder dock:

7.1 Where the transfer operation for filling cylinders is conducted in a separate building or structure verify compliance with NFPA 58 10.2.

7.2 Inspect hoses as in Section 6.4.

7.3 Scales

7.3.1 Check scales to insure they are balanced at 0

7.3.2 Verify scales are permitted

7.4 Check fire extinguisher as in Section 3.1.

7.5 Verify electrical equipment & switches within the classified area are in compliant with NFPA 58 6.22.

8.0 Rail Riser

8.1 Inspect hoses as in Section 6.4.

8.2 Visually inspect ESV for railroad tank car transfer system.

8.2.1 Verify an ESV is installed at the railroad tank car end of the hose or swivel-type piping where the flow into or out of the tank car is possible.

8.2.2 Verify and ESV or backflow check valve is installed on the tank car end of the hose or swivel piping where the flow is only into the railroad tank car.

8.3 Inspect quick connects for damage.

8.4 Inspect all valves for operation, signs of damage and or leaks.

NOTE: Check for leaks in accordance with the departments established procedure for detection of leaks.

8.5 Inspect piping per piping procedure Section 5 of this procedure.

8.6 Verify location is equipped with Rail Car chock blocks and track signage.

NOTE: If a rail car is on site, chock blocks and signage must be in place.

8.7 Verify compressor & electrical switches within the classified area are in compliant with NFPA 58 6.22.

Version	Rev. Date	Change Control Comments	Approver
1.1	9/19/16	Section 6.4.2.1-6.4.2.5 updated language	AES
1.2	12/12/16	Section 4.5.2.3.3 updated required signage	AES