# Quality Control Manual

for

| | | |
|---|---|---|
| ☐ | **Manufacture,** | **[M]** |
| ☐ | **Modification,** | **[Mod]** |
| ☐ | **Repair,** | **[R]** |
| ☐ | **Assembly,** | **[A]** |
| √ | **Inspection, Test, and Retest** | **[IT]** |

of

**Highway Tanks and Portable Tanks**

for the

**Transportation of Dangerous Goods by Road**

in accordance with CSA B620-14 or the most current version
(based on Transport Canada TDG regulations)

**Facility Address:** 8909 Henri-Bourassa Blvd Est., Anjou, PQ, H1E 1P4

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This manual is in accordance with CSA B620-14 or the most current version (based on Transport Canada TDG regulations) and is for the following facility of National Energy Equipment Inc..

| Facility Address | Registration No. | Activities: |
|---|---|---|
| 8909 Henri-Bourassa Blvd Est., Anjou, PQ, H1E 1P4 | 25-xxxx | Inspection, Test, & Retest |

National Energy Equipment Inc.'s National Quality Systems Manager ensures the quality system meets the requirements of the CSA B620-14 or the most current version.

In this manual anywhere mentioned CSA B620, it means CSA B620-14 or the most current version - (based on Transport Canada TDG regulations)

**National Energy Equipment Inc. Authorization**

**Approved by:**

**Name:** Zanyar Farhadi

**Title:** National Quality Systems Manager

**Phone:** (778) 588 7739

**Email address:** zfarhadi@nee.ca

**Signature:**

**Date:**

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## SECTION - 1 Scope

This manual applies to the National Energy Equipment Inc. (NEEI) facility with the registration number of of **25-xxxx**, located at **8909 Henri-Bourassa Blvd Est., Anjou, PQ, H1E 1P4**, only to those Highway Transport tanks manufactured in accordance with the specifications contained in the CSA B620.

Work is including all or some of the followings: inspection, test and retest of highway tanks.

| | Tank Specification | Inspection - External | Inspection - Internal | Inspection - Lining | Inspection - Upper coupler | Test/Retest - Hydrostatic | Test/Retest - Pneumatic | Test/Retest - Leak Test | Test/Retest - Fluorescent Test | Test/Retest - Thickness Test | Tanks - Repair | Tanks - Manufacture | Tanks - Assembly | Tanks - Modification | Piping - Repair | Piping - Manufacture | Piping - Modification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Highway Tanks | TC 406 | M | | | | | | M | | | | | | | | | |
| | TC 407 | M | | | | | | M | | | | | | | | | |
| | TC 306 | M | | | | | | M | | | | | | | | | |
| | TC 307 | M | | | | | | M | | | | | | | | | |
| | TC 331 | M | | | | | | M | | | | | | | | | |

## SECTION - 2 Definitions and Glossary of Abbreviations

| | |
|---|---|
| ASME | American Society of Mechanical Engineers (generally refers to boiler and pressure vessel codes) |
| AWS | American Welding Society |
| CODE | The code or specification that the tank is built to (eg. MC 306, TC 406) |
| CSA | Canadian Standards Association |
| CSA B620 | The Canadian Standard that includes highway tank specifications and inspection and testing requirements (Revision 14 or most current version) |
| DOT | United States Department of Transportation |
| HAWP | Hose assembly working pressure (the anticipated working pressure of the hose assembly, which does not exceed the maximum working pressure of the hose assembly′s lowest-rated component.) |
| Hot work | any work involving welding, cutting, grinding, drilling, or exposure to open flame. |
| ISC | Internal Self Closing (valve) |
| “K” | The cargo tank marking that indicates a LEAK test |
| MAWP | The maximum allowable working pressure of a cargo tank as indicated on the data plate |
| MDIN | Manufactures Design Identification Number |
| MC | Motor Carrier as used in code designations (eg. MC 306) |
| NEEI | National Energy Equipment Inc. |
| PSI | Pounds per square inch |
| SRV | Safety Relief Valve |
| TC | Transport Canada |
| TDG | Transportation of dangerous goods |
| TCRN | Transport Canada Registration Number |
| “V” | The cargo tank marking that indicates an EXTERNAL visual inspection |

## SECTION - 3 Statement of Authority

This manual outlines the requirements for the activities, as detailed in Section 1. In addition, this program addresses the National Quality Systems Manager's responsibility, which details the support of the management of National Energy Equipment Inc. (NEEI), for administrating the quality control program and the various related standards to be used for the activities.

### 3-1 Responsibilities:

All involved personnel are totally committed to meeting the requirements of CSA B620, NEEI policies, and the quality control system outlined in this manual.

The National Quality Systems Manager (NQSM) is responsible for the preparation, revision, approval and issuance of the quality control manual. The NQSM and Quality Assurance Specialist (QAS) are responsible for the administration and implementation of the quality control program in the shops. Each NEEI branch's Process Owner, shall help them in accordance with the quality control program. The NQSM has the responsibility and authority to control production, and the organizational freedom to:

- Identify quality control problems;
- Initiate action, which results in solutions to those problems;
- Verify implementation of solutions to those problems; and
- Control further processing, delivery or unsatisfactory condition until proper disposition has been made.

Process Owners will be responsible for their assigned activities. They may delegate the performance of their assigned duties to qualified individuals but they shall retain the responsibility for those assigned activities.

In the event of a disagreement between the responsible person and the Process Owner, the problem shall be brought to the NQSM for resolution. Any resolution shall not negate the requirements of CSA B620, or this Manual.

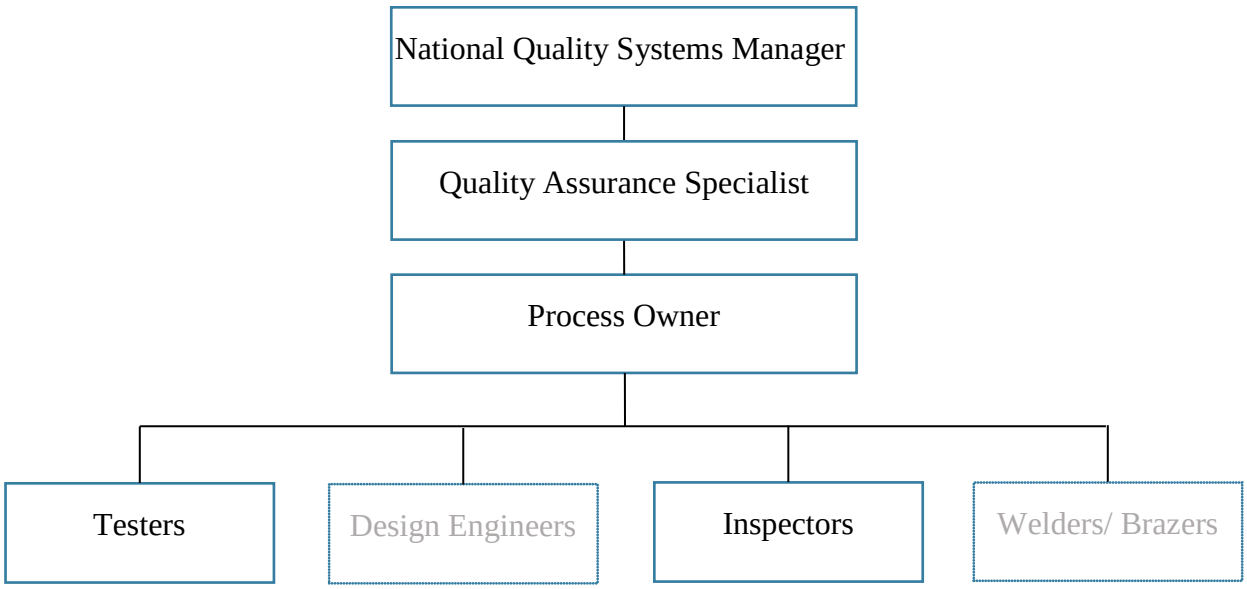
### 3-2 Codes and standards

The latest edition of codes and standards of Canadian Standards Association (CSA) which are specified in Transportation of Dangerous Goods of Transport Canada shall be applied for B620 program. Any other standards which are mentioned in Transport Canada website, also shall be used.

### 3-3 Signature

Signed: _____ Title: _____ Date: _____

## SECTION- 4 Organization Chart




## SECTION- 5 Manual Control

This Manual and its revisions shall be prepared, issued, maintained, and approved by the National Quality Systems Manager. The approval and acceptance of the National Quality Systems Manager are shown on each page of the manual.

This Manual shall be reviewed at least once a year at the management review meeting to ensure all procedures are current and in conformance with CSA B620 or most current version and be revised at that time if required.

If revisions are required to this Manual they shall be implemented at the date the changes in regulation take effect. The only controlled copy of the latest revision of Manual is placed in the NEEI's intranet.

Revision shall be described in the revision control sheet (section22) and noted on the Table of Contents and each page of the Quality Control Manual.

The National Quality Systems Manager shall issue, distribute and maintain copies of this Quality Control Manual and its revisions. The same person is responsible for removal of superseded versions from circulation.

**SECTION- 6 Drawing and design control** **N/A**

**SECTION- 7 Manufacture** **N/A**

**SECTION- 8 Assembly** **N/A**

**SECTION- 9 Modification** **N/A**

**SECTION- 10 Repairs** **N/A**

**SECTION - 11 Material Control** **N/A**

## SECTION - 12 Inspection and testing – Examination

For each tank design, all drawings, design calculations, and specifications shall be in accordance with CSA B620, and selected by B621 or B622 Standards (the most current version),

As applicable, the NEEI plans and carries out production and service provisions under controlled conditions. Controlled conditions include:

1) the availability of information that describes the characteristics of the product,

2) the availability of work instructions, as necessary,

3) the use of suitable equipment,

4) the availability and use of monitoring and measuring devices,

5) the implementation of monitoring and measurement activities, and

6) the implementation of product release, delivery and post-delivery activities.

The Inspector shall have free access to such parts which shall include, but not be limited to the following:

a) Location where inspection and testing takes place

b) Quality Control Manual

The Process Owner shall be responsible for:

1) Ensuring that all required examinations and inspections are performed in compliance with the current edition of CSA B620 and TDG regulations and shall ensure that these examinations and inspections are done in accordance with approved procedures,

2) Collecting all related documentation such as design changes, calculations, specifications, repairs, examination and test reports, travel sheets into the Job File for each Highway Tank being recertified,

3) Maintaining the Job File (by job number and/or serial number).

4) Maintenance of reports and other related documents to be kept in the Job File and final copies issued to tank owner.

For all tanks that are to be inspected or tested, the inspector or tester shall ensure that all precautions are taken to ensure that there is no hazard to personnel performing the inspection and test.

## 12.1 Inspection Program

Periodic inspection and test intervals shall be held based on the mentioned table 7.1 of CSA B620. (Section 21.1)

If more than one test or inspection interval is prescribed for a given tank in a particular service, then the shortest interval shall apply. The due dates for the first periodic retest and inspection are measured from the original test and inspection date marked on the tank, or if no test date is marked, the certification date.

The inspection reports shall be documented on the Test and Inspection Report (Form No. NEE-FRM-007).

### 12.1.1 Periodic and obligatory inspection and testing.

Periodic inspection and test intervals are based on Table 7.1 of CSA620. (Section 21.1)

If more than one test or inspection interval is prescribed for a given tank in a particular service, then the shortest interval shall apply. The due dates for the first periodic retest and inspection are measured from the original test and inspection date marked on the tank, or if no test date is marked, the certification date.

In addition to the periodic retesting or inspection requirements, pneumatic retesting and inspection shall be required prior to further use if:

1) The tank shows evidence of bad dents, corroded or abraded areas, leakage, or any other condition that might render the tank unsafe for transportation service;

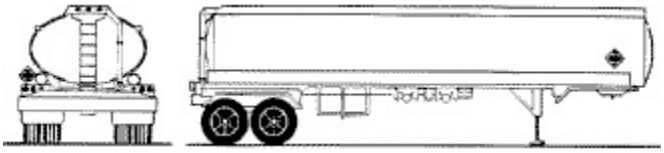
2) The tank has been involved in an accident in which it may have been dented, torn, or otherwise damaged so as to affect its lading retention capability; or

3) The tank has not been used for transporting dangerous goods for 1 year or more,

## 12.2 External Visual Inspection (V) - Typical interval is every year (annually)

### 12.2.1 Highway tanks for the transportation of dangerous goods other than liquefied compressed gases TC406(306), TC407(307)

**TC406, Older version:TC306**



Highway tank for flammable liquids and low hazard chemicals (e.g. gasoline, diesel);
Steel or aluminum shell or reinforced plastic;
MAWP between 18 and 28 kPa (2.65 and 4 psi);
If transporting crude, MAWP between 18 and 100 kPa (2.65 and 14.7 psi);

1) Inspect all tank markings for legibility. Markings must not be faded, defaced or torn.

2) Inspect to ensure that all information on the tank data plate are concise and legible. If data plate or on the tank is illegible or information is incomplete, note on the Inspection Report and reject tank. For complete list of the required information, refer to 'Required information on the Identification Plate checklist'.

3) Inspect to ensure each manhole cover is permanently marked with

   a. the manufacturer′s name;

   b. the test pressure — XXX kPa (psi); and

   c. a statement certifying that the manhole cover meets the testing requirements of
      i. clause 5.6.6 of CSA B620; or
      ii. §178.345-5 of 49 CFR

4) Inspect entire exterior surface area including heads for signs of corrosion, abrasion, gouges, dents or repairs made using overlay patches. Inspect surfaces of all welds for signs of defects or cracks visually by checking with hand and using flashlight if needed, especially in areas around tank nozzles.

5) The corroded or abraded areas of the tank wall shall be thickness tested by a facility registered with Transport Canada, in accordance with clause 7.2.6 of CSA B620 (Thickness test).

6) Ensure manhole tightening devices are operative, and the covers are leak-tight, with no signs of product stains.

7) Ensuring proper functioning of all valves, vents, and emergency devices, including pressure relief valves, self-closing stop-valves, excess-flow valves, and remote closure devices, and connections are properly identified (emergency closure, liquid and vapour, etc.) ensuring that they are free of corrosion, distortion, or any other damage that would prevent their normal operation.

8) Either replace or test the pressure relief valves (PRV) to ensure that they open at the required set-to-discharge pressure for the tank's MAWP, and re-seat them to a leak-tight condition at not less than 90% of that pressure, or to the re-seat pressure prescribed for the tank specification.

9) Ensuring that all bolts or nuts on any flanged connection or blank flange are in place and properly tightened by checking with a proper wrench.

10) Ensuring that all major appurtenances, piping, attachments, connecting structures, and those elements of the upper coupler assembly (if applicable) that can be inspected without dismantling the assembly are not damaged or corroded so as to affect safe operation of the vehicle.

11) Ensure that hose assemblies mounted on or accompanying the tank do not display any defects, have legible markings, and where required, have been pressure tested and tagged indicating that they were pressure tested.

12) Ensure any void drains are unplugged and inspect for signs of product residue or leakage.

13) Ensure that all bolts used to secure tank to the frame are present. Use a proper wrench to confirm bolts are tight.

14) Rollover protection facilities are properly installed on the tank. The welding of any appurtenance to the shell or head must be made by attachment of a mounting pad.

15) Bumpers of the cargo tank is properly installed to the specified dimensions, and it will successfully absorb the impact of the vehicle with rated payload. The clearance between the effective bottom of the bumpers or devices and the ground is less than 76cm (30in) when the vehicle is empty;

16) Inspect to ensure that all hose assemblies mounted on or accompanying the tank do not display any defects and have legible markings.

17) The original plate shall not be removed in any condition.

18) Ensure that the tank is equipped with one or more dry chemical fire extinguishers accessible from the ground, with a combined total effective rating of not less than 40BC. Each of them shall be recharged immediately after each use.

19) Ensure that the tank is equipped with an automatic engine air intake shut off device that prevent engine runaway in case of exposure to flammable vapours. The device shall activate automatically if engine runaway is detected and remain activated until manually reset.

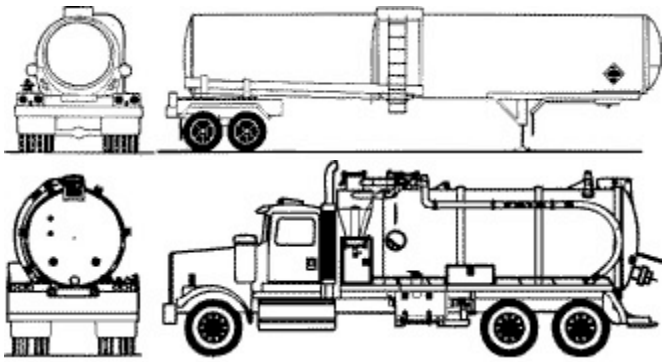
20) In addition to the rejection criteria (as stated in Clause 7.2.1.8 of CSA B620), reject the tanks when the following defects are found during an external inspection:

- Any dent with a depth of more than 12.7 mm (0.5 in) where it includes a weld;
- Any dent with a depth of greater than 10% of the length of the dent,
- Any weld defect, including a crack, pinhole, or incomplete fusion of the weld;
- Any structural defect; and

- Any source of leakage, or
- Repairs made to liquid-retaining components using overlay patches.
- When any noted CSA B620 design requirements are not met such as impact protection or rear bumper restrictions, etc.

21) Ensure all outlets, valves, closures, piping, or any devices that if damaged in an accident could result in a loss of lading, are protected by accident damage protection.

**TC407, Older version:TC307**



Highway tank for toxic, corrosive and flammable liquids;
Circular cross-section;
Steel, aluminum or reinforced plastic;
MAWP of at least 172 kPa (25 psi);
Over 235 kPa (35 psi) or vacuum loaded, must be ASME;
May be vacuum loaded if external design pressure is at least 103 kPa (15 psi) and internal design pressure is at least 173 kPa (25 psi);

1) Inspect all tank markings for legibility. Must not be faded, defaced or torn.

2) Inspect to ensure that all information on the tank data plate are concise and legible. If data plate or on the tank is illegible or information is incomplete, note on the Inspection Report and reject tank. For complete list of the required information, refer to 'Required information on the Identification Plate checklist'.

3) Inspect to ensure each manhole cover is permanently marked with
   a. the manufacturer′s name;
   b. the test pressure — XXX kPa (psi); and
   c. a statement certifying that the manhole cover meets the testing requirements of
      i. clause 5.6.6 of CSA B620; or
      ii. §178.345-5 of 49 CFR

4) On non-insulated tanks, inspect entire exterior surface area including heads for signs of corrosion, abrasion, gouges, dents or repairs made using overlay patches. Inspect surfaces of all welds for signs of defects or cracks visually by checking with hand and using flashlight if needed, especially in areas around tank nozzles.

5) On insulated tanks note all signs of exterior damage and signs of leakage and check for loose or damaged jacketing material. Any leakage from drain of void space indicates leak in tank wall therefore tank shall be rejected.

6) The corroded or abraded areas of the tank wall shall be thickness tested by a facility registered with Transport Canada, in accordance with clause 7.2.6 of CSA B620 (Thickness test).

7) Ensure manhole tightening devices are operative, and the covers are leak-tight, with no signs of product stains.

8) Ensuring proper functioning of all valves, vents, and emergency devices, including pressure relief valves (PRV), self-closing stop-valves, excess-flow valves, and remote closure devices, and connections are properly identified (emergency closure, liquid and vapour, etc.) ensuring that they are free of corrosion, distortion, or any other damage that would prevent their normal operation.

9) Either replace or test the pressure relief valves to ensure that they open at the required set-to-discharge pressure for the tank's MAWP, and re-seat them to a leak-tight condition at not less than 90% of that pressure, or to the re-seat pressure prescribed for the tank specification.

10) Ensuring that all bolts or nuts on any flanged connection or blank flange are in place and properly tightened by checking with a proper wrench.

11) Ensuring that all major appurtenances, piping, attachments, connecting structures, and those elements of the upper coupler assembly (if applicable) that can be inspected without dismantling the assembly are not damaged or corroded so as to affect safe operation of the vehicle.

12) Ensure that hose assemblies mounted on or accompanying the tank do not display any defects, have legible markings, and where required, have been pressure tested and tagged indicating that they were pressure tested.

13) Ensure any void drains are unplugged and inspect for signs of product residue or leakage.

14) Ensure that all bolts used to secure tank to the frame are present. Use a proper wrench to confirm bolts are tight.

15) Rollover protection facilities are properly installed on the tank. The welding of any appurtenance to the shell or head must be made by attachment of a mounting pad.

16) Bumpers of the cargo tank is properly installed to the specified dimensions, and it will successfully absorb the impact of the vehicle with rated payload. The clearance between the effective bottom of the bumpers or devices and the ground is less than 76cm (30in) when the vehicle is empty;

17) Inspect to ensure that all hose assemblies mounted on or accompanying the tank do not display any defects and have legible markings.

18) The original plate shall not be removed in any condition.

19) Ensure that the tank is equipped with one or more dry chemical fire extinguishers accessible from the ground, with a combined total effective rating of not less than 40BC. Each of them shall be recharged immediately after each use.

20) Ensure that the tank is equipped with an automatic engine air intake shut off device that prevent engine runaway in case of exposure to flammable vapours. The device shall activate automatically if engine runaway is detected and remain activated until manually reset.

21) In addition to the rejection criteria (as stated in Clause 7.2.1.8 of CSA B620), reject the tanks when the following defects are found during an external inspection:

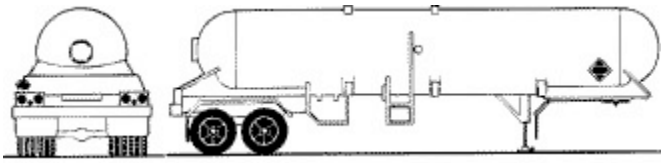
- Any dent with a depth of more than 12.7 mm (0.5 in) where it includes a weld;
- Any dent with a depth of greater than 10% of the length of the dent,
- Any weld defect, including a crack, pinhole, or incomplete fusion of the weld;
- Any structural defect; and
- Any source of leakage, or
- Repairs made to liquid-retaining components using overlay patches.
- When any noted CSA B620 design requirements are not met such as impact protection or rear bumper restrictions, etc.

22) Visually inspect the gaskets on any full opening rear head tanks for cuts, cracks, or splits, and replaced if cuts, cracks, or splits that are likely to cause leakage, or are a depth of 12.7 mm (0.5 in) or more, are found.

23) Ensure all outlets, valves, closures, piping, or any devices that if damaged in an accident could result in a loss of lading, are protected by accident damage protection.

### 12.2.2 Highway tanks for the transportation of liquefied compressed gases and refrigerated liquefied gases TC331

**TC331**



Highway tank for liquefied compressed gases (e.g. LPG, NH3);
Steel or aluminum;
Design pressure shall be at least 690 kPa (100 psi) and not more than 3450 kPa (500 psi);

1) Inspect all tank markings for legibility. Must not be faded, defaced or torn.

2) Inspect to ensure that all information on the tank data plate are concise and legible. If data plate or on the tank is illegible or information is incomplete, note on the Inspection Report and reject tank. For complete list of the required information, refer to 'Required information on the Identification Plate checklist'.

3) Inspect entire exterior surface area including heads for signs of corrosion, abrasion, gouges, dents or repairs made using overlay patches. Inspect surfaces of all welds for signs of defects or cracks visually by checking with hand and using flashlight if needed, especially in areas around tank nozzles.

4) The corroded or abraded areas of the tank wall shall be thickness tested by a facility registered with Transport Canada, in accordance with clause 7.2.6 of CSA B620 (Thickness test).

5) Ensure manhole tightening devices are operative, and the covers are leak-tight, with no signs of product stains.

6) Ensuring proper functioning of all valves, vents, and emergency devices, including pressure relief valves (PRV), self-closing stop-valves, excess-flow valves, and remote closure devices, and connections are properly identified (emergency closure, liquid and vapour, etc.) ensuring that they are free of corrosion, distortion, or any other damage that would prevent their normal operation.

7) Either replace or test the pressure relief valves to ensure that they open at the required set-to-discharge pressure for the tank's MAWP, and re-seat them to a leak-tight condition at not less than 90% of that pressure, or to the re-seat pressure prescribed for the tank specification.

8) Ensuring that all bolts or nuts on any flanged connection or blank flange are in place and properly tightened by checking with a proper wrench.

9) Ensuring that all major appurtenances, piping, attachments, connecting structures, and those elements of the upper coupler assembly (if applicable) that can be inspected without dismantling the assembly are not damaged or corroded so as to affect safe operation of the vehicle.

10) Ensure that hose assemblies mounted on or accompanying the tank do not display any defects, have legible markings, and where required, have been pressure tested and tagged indicating that they were pressure tested.

11) Ensure any void drains are unplugged and inspect for signs of product residue or leakage.

12) Ensure that all bolts used to secure tank to the frame are present. Use a proper wrench to confirm bolts are tight.

13) Rollover protection facilities are properly installed on the tank. The welding of any appurtenance to the shell or head must be made by attachment of a mounting pad.

14) Bumpers of the cargo tank is properly installed to the specified dimensions, and it will successfully absorb the impact of the vehicle with rated payload. The clearance between the effective bottom of the bumpers or devices and the ground is less than 76cm (30in) when the vehicle is empty;

15) Inspect to ensure that all hose assemblies mounted on or accompanying the tank do not display any defects and have legible markings.

16) The original plate shall not be removed in any condition.

17) Ensure that the tank is equipped with one or more dry chemical fire extinguishers accessible from the ground, with a combined total effective rating of not less than 40BC. Each of them shall be recharged immediately after each use.

18) Ensure that the tank is equipped with an automatic engine air intake shut off device that prevent engine runaway in case of exposure to flammable vapours. The device shall activate automatically if engine runaway is detected and remain activated until manually reset.

19) In addition to the rejection criteria (as stated in Clause 7.2.1.8 of CSA B620), reject the tanks when the following defects are found during an external inspection:

- Any dent with a depth of more than 12.7 mm (0.5 in) where it includes a weld;
- Any dent with a depth of greater than 10% of the length of the dent,
- Any weld defect, including a crack, pinhole, or incomplete fusion of the weld;
- Any structural defect; and
- Any source of leakage, or
- Repairs made to liquid-retaining components using overlay patches.
- When any noted CSA B620 design requirements are not met such as impact protection or rear bumper restrictions, etc.

20) Ensure all outlets, valves, closures, piping, or any devices that if damaged in an accident could result in a loss of lading, are protected by accident damage protection.

21) Off-truck emergency shutdown systems, shall be tested as per form number NEE-FRM-010 Inspection Check List for TC-331 mentioned in Section 21.1

22) Control will be tested at the time of inspection as follows:

- TC 331 tanks that transport liquefied compressed gas (LPG) are required to have Emergency discharge controls, except designed to transport Class 2.2, non-flammable and non-toxic gases.
- Tanks that are 13,250L or less, equipped for metered Service, need an off-truck emergency shutdown system.
- Tanks that are 13,250L or more, equipped for metered service, will need either a monitoring feature or a passive emergency shutdown system in addition to an off-truck emergency shut down system.
- With product running at normal flow rate throughout the metering system, activate the off-truck Emergency shutdown system (normally this would be a BASE Engineering product). Observe the meter to determine how long it takes to stop the product flow. The meter should stop the flow and close the ISC within 30 seconds or sooner. No meter creep after 5 seconds.
- The same process for testing the Emergency Discharge Controls shall be used on both ON and OFF truck applications.
- The emergency shut down system shall function reliably at a distance of 46 m (150ft)
- When the Emergency shutdown has been activated, the ISC can't be reactivated remotely.
- Indicate results on Test and Inspection Report (Form No. NEE-FRM-007).
- For non-metered tanks, all ISC valves shall be open. Each emergency discharge control remote actuator (on-truck and off-truck) shall be operated to ensure each ISC valve indicator has moved to the closed position. Once all ISC valves are closed, all of the material in the downstream piping shall be evacuated, and the piping shall be returned to atmospheric temperature and pressure. The outlet shall then be monitored for 30 seconds to ensure that there is no detectable leakage.

23) Piping or hose used for loading/unloading liquefied gas shall be provided with a manual bleed valve or other means of relieving pressure before the hose is disconnected.

## 12.3 Internal Visual Inspection (I) NA

## 12.4 Upper Coupler Inspection (UC) NA

### 12.5 Leakage Test (K) - Typical interval is every year (annually)

The tank shall successfully pass an External Visual Inspection prior to performing this test and if this test is being conducted at the frequency a pressure re-test is due, the pressure re-test shall be conducted first.

All product piping valves and accessories shall be in place with the exception of any normal breathing vents (vents set to release at less than test pressure), which shall be rendered inoperative.

Test pressure shall be not less than 80% of the tank design test pressure or MAWP, whichever is less, and marked on the certification plate, except if a tank with a MAWP of 690 kPa (100 psig) or more is used in dedicated service or services, the test pressure shall be the maximum normal operating pressure of the tank.

1) Put in place a Pressure Safety Relief valve and set at MAWP.

2) Test each valve and closure in sequence, with the tank laden under normal operating conditions

3) Close internal valve and open manifold valve (if equipped) and all other valves in discharge line, including external valve.

4) Ensure any adjacent compartments and void spaces are empty and open to atmosphere i.e. double walled tanks.

5) Fill compartment with enough test medium to cover the valve sump and fill the piping. Close all remaining openings.

- One of the following shall be used as the test medium:
  - (i) the normal lading of the tank;
  - (ii) a less hazardous lading of equal or less viscosity;
  - (iii) water;
  - (iv) inert gas;
  - (v) air.

  Note: When using air as a test medium, the tester should be aware of the need for proper purging and ensure that there is no possibility of creating a mixture of product and air within the explosive limits of the product.

6) Pressurize the tank to the correct pressure with regulated air. Once the test pressure is reached, shut off the supply. The test pressure must be maintained for at least 5 minutes with no loss. If a tank is in dedicated service and over 100 psi the normally lading of the product will be used at the maximum of the normal operating pressure. MC 331 or TC 331 in LPG or NH3 service shall be tested at no less than 60 PSI.

7) With tank under pressure, check all weld seams with soap and water mix. Check for signs of any leakage. Inspect gaskets at internal valves and manhole covers, and venting devices.

8) Close first valve or closure in discharge system and open internal valve, leaving all other valves in discharge line open including external valve. Adjust pressure to the correct pressure for the tank being tested and shut off the supply. The piping and the first valve in discharge system will now be pressurized in addition to the tank shell; test pressure must hold for 5 minutes with a 0 psig drop.

9) Repeat the above procedure (8) for each valve and closure in discharge line, until all valves and closures have been tested. If piping includes pumps and meters these should be tested at the tank leak test pressure in sequence with the immediate downstream valve or closure closed and all upstream valves and closures open. Carefully inspect all joints in pumps and meter for signs of leakage. If piping system includes hose reel, unreel the hose to its full length and carefully inspect hose connections for leakage.

10) Relieve pressure in tank and ensure normal breathing vent is returned to operative status.

11) Indicate all defects found and methods used to repair on the Test and Inspection Report (Form No.: NEE-FRM-007) in accordance with clause 7.3 of CSA B620.

12) All leaks must be repaired and retested prior to marking tank.

13) During the test, precautions shall be taken to prevent overpressurization of the tank.

### 12.6 Thickness Test (T) (Only at periodic inspections) NA

### 12.7 Pressure Tests (P) NA

## 12.8 Testing in-service, unmarked or uncertified cargo tank manway covers

12.8.1 Purpose

The purpose of this test procedure is to qualify, by means of a pressure test, the structural integrity of in-service manways and fill openings.

12.8.2 Qualifying Test

- In-service manways and/or fill opening covers not marked as certified by the manufacturer shall be tested using the equipment described in 12.8.3 and the procedure described in 12.8.4.
- Manway and/or fill opening covers successfully meeting this test per 5.0 and prior to reinstallation on the cargo tank may be permanently marked by stamping or other means. The name of the tester and date of the test should be recorded and retained.
- Any device, such as a pressure relief valve, which becomes a part of the manway cover assembly, shall be evaluated separately for compliance.

12.8.3 Test Equipment (See Figure 1)

- The test fixture for the 15-psig test consists of 16” diameter, 20” diameter, or 12”x 16” elliptical collars with a suitable material welded to the bottom. The test fixture collar shall be the same size, thickness, and material as that collar on the tank to which the manway cover assembly is to be installed if it complies with CSA B620 requirements.
- Gauges: One (1) 0-30 psig for leakage test.
- Pipe fittings:

  One (1) ½” NPT globe valve
  One (1) ½” ball valve
  One (1) ½” cross
  Five (5) ½” pipe nipples
- Rubber membranes of 1/8” thickness to fit outside diameter of manway collar.
- Steel plate with guides to block fill opening only if fill opening cover acts as a pressure relief valve. Please note that some old manway covers have fill covers that do not provide pressure relief and those fill covers should not be blocked closed.
- Vent plugs, flanges, or other devices to block holes in manway cover.
- Manway gaskets - One (1) for each size manway assembly to be tested.
- Gasket for the 10-inch diameter pressure relief valves.

12.8.4 Manway Cover Test Procedures

12.8.4.1 Remove manhole cover assembly and clamping ring assembly to be tested from the cargo tank.

12.8.4.2 Remove any normal pressure/Vacuum vents, sensors, high capacity vents or any other appurtenance that protrudes below the manhole cover.

12.8.4.3 Block the openings in the manhole cover by a proper device.

12.8.4.4 Fill test fixture base with water to top of collar.

12.8.4.5 Lay rubber membrane on test base.

12.8.4.6 Open 10" diameter pressure relief valve. Install steel plate with guides to underside of 10" diameter opening. Use vice grips to hold this plate in position while placing manhole cover assembly on rubber membrane.

12.8.4.7 Install 10-30 psig gauge in test base.

12.8.4.8 Attach manhole cover assembly with its clamping ring assembly to the test fixture. While tightening clamping ring bolt, tap the ring at various points to ensure equal clamping.

12.8.4.9 Slowly pressurize test fixture to 15 psig for a period of at least 5 minutes.

CAUTION: WATCH PRESSURE. DO NOT OVER-PRESSURIZE.
Most water systems provide a pressure over 50 psig.

12.8.5 Inspection

12.8.5.1 Any leakage will be considered a failure of this cover and others of its type and condition.

12.8.5.2 If the cover does not pass this test in its original condition, but the manhole cover assembly manufacturer has components available that will enable the cover to pass the test, covers using such components are considered satisfactory.

12.8.5.3 Before reinstalling the manhole cover to the cargo tank, the collar and gasket shall be inspected. If damage, distortion, corroded areas or other conditions exist that could impair its product retention capability, the collar and/or gasket shall be replaced.

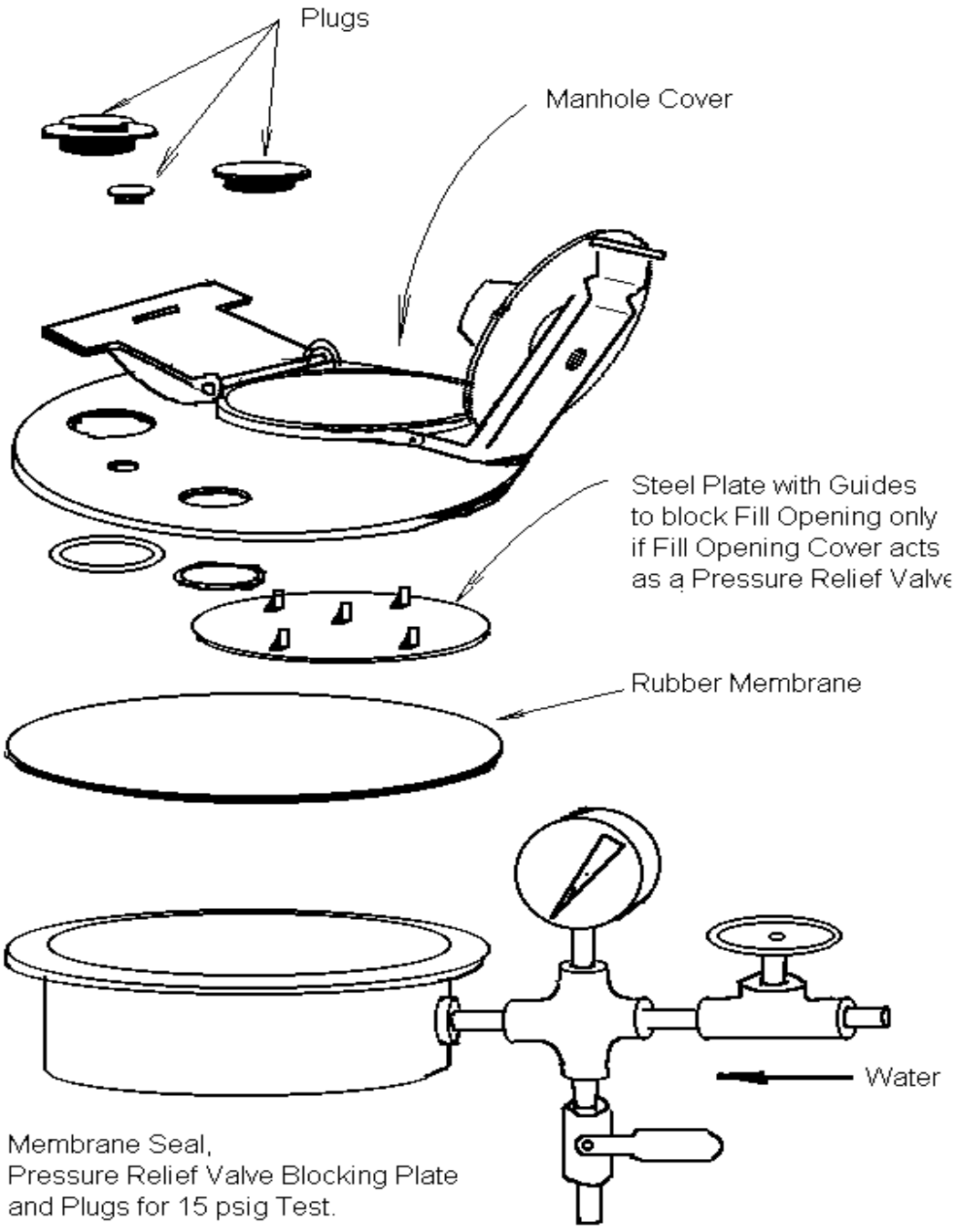



Figure 1 Fixture used in the test.

## 12.9 Product hose testing procedure

12.9.1 Scope

This procedure covers hose testing requirements in accordance to B620, Clause 7.2.10, and applies to product delivery and vapour return hose assemblies that are temporarily connected between the tank or any tank-mounted accessory and the point of supply or receipt during loading or off-loading, but do not apply to hose assemblies that are part of the piping system.

Hoses may be tested annually on or off the vehicle.

Hoses may be tested by other qualified hose testing organizations.

12.9.2 Frequency

All hoses shall be tested once per year

12.9.3 Safety

Hose testing shall be performed in a manner that ensures all safety provisions including but not limited to any required 'personal protective equipment' (PPE), safety system and barricades /cones to protect personnel during testing in the event of a hose failure. Some safety provisions are as follows:

(i) Ensure that all hose fittings are securely fastened
(ii) If during the test a severe leak or hose rupture occurred, stop the test
(iii) The hose should be inspected by walking down the hose (away from the pump towards the nozzle)
(iv) Stay in a safe distance away from the hose while it is under test pressure and never straddle the hose or move the hose once it is under test pressure.
(v) Prevent over-pressurizing the hose during the hose testing.

12.9.4 Training

All employees involved in hose testing shall be trained in testing procedures and rejection criteria. Records of training shall be kept in the related employment files.

12.9.5 Procedure

(a) A hose assembly having any damage identified in Clause 7.2.10.4 of CSA B620 shall be taken out of service and not be pressure tested until repaired.

(b) The test pressure shall be

(i) for CSA-certified hose assemblies, not less than 2400 kPa (350 psi);
(ii) for gravity off-load hose assemblies (drop hoses), not less than 69 kPa (10 psi);
(iii) for vapour recovery hose assemblies on TC 406 tanks and the equivalent and substitute tanks identified in CSA B621, not less than 69 kPa (10 psi);
(iv) for all other hose assemblies, the greater of 120% of the marked HAWP of the hose assembly and 518 kPa (75 psi).

(c) The following shall not be used to pressurize the hose assembly:

(i) compressed gas;
(ii) compressed air;
(iii) flammable liquid; or
(iv) corrosive liquid.
Note: Water is the recommended test fluid.

(d) The requirements of Item (c) shall not apply to

(i) hose assemblies used to handle aircraft fuel;
(ii) CSA-certified hose assemblies; or

(iii) hose assemblies used in refrigerated liquefied gas service that are manufactured and documented as conforming to CSA B51 or ASME B31.3 and marked "CSA B51" or "ASME B31.3" by the hose assembly manufacturer.

(e) Provisions shall be made to protect personnel during testing should failure occur.

(f) To pass the pressure test, the hose assembly shall hold the pressure without bulging, distortion, or leaks for at least 5 min when isolated from the pressure supply.

12.9.6 Hose Markings Upon successful completion of the Hose Inspection and Testing hose assemblies shall be either tagged with a metal tag or stamped on the coupling, in such a way not to affect the integrity of the hose, with letters/numbers of not less that 5mm high, with the month and year of the test. The HAWP for a hose assembly that is not already marked may be determined by referring to documentation provided by the hose and coupling manufacturer or supplier or by inspecting the hose and couplings for markings applied during manufacturing that indicate the maximum working pressure for the component. A HAWP shall be marked on a hose that is successfully tested. Hose assemblies for which ratings cannot be determined shall not be marked. If not already marked on the hose assembly, markings shall also be applied to indicate the serial number or identification number of the hose assembly.

12.9.7 Test Report A test report shall be completed indicating name of the facility conducting the test, the hose assembly serial or identification number, the HAWP, the date and nature of inspection or test. The report shall be maintained for a minimum of 2 years. These records may be maintained electronically.

## 12.10 References

| | | |
|---|---|---|
| NEE-FRM-007-406 | Test and Inspection Report for TC406/TC(MC)306 tanks | (See 21.1) |
| NEE-FRM-007-407 | Test and Inspection Report for TC407/TC(MC)307 tanks | (See 21.1) |
| NEE-FRM-007-331 | Test and Inspection Report for TC(MC)331 tanks | (See 21.1) |
| NEE-FRM-012 | Hose Assembly Test and Inspection Report | (See 21.1) |
| Table 7.1 of CSA B620 | Periodic inspection and test intervals | (See 21.1) |
| Table 7.3 of CSA B620 | Pressures for periodic retesting | (See 21.1) |
| Required information on the Identification Plate checklist | | (See 21.1) |

## SECTION- 13 Test and inspection marking

Upon successful completion of a test or registered activities in compliance with CSA B620, the tank inspector shall mark the tank in accordance with this section.

The markings shall be a minimum of 32mm high and clearly contrast with the background and shall be located on the tank front head or jacketing or above the identification plate, or anywhere on the front head where it is clearly visible from the ground. The markings shall be printed on durable labels and affixed to tanks firmly.

The markings shall consist of:

- The month and year of the inspection or test
- The letter indicating the type of inspection or test performed (in accordance with Clause 7.4 of CSA B620)
- The last four digits of the Facility Registration Number, as shown on the TC Certificate of Registration for the facility

The letters indicating the types of test of inspection shall be as follows:

"V" - External Visual Inspection

"K" - Leakage Test

Typical Marking: 02/18 VK xxxx

where: 02/18 indicates Inspection and Test performed February 2018; VK indicates External Visual and Leakage Tests were successfully completed; xxxx indicates the last digits of the Transport Canada Facility Registration number

## SECTION- 14 Nonconformities – Corrective action

A non-conformity is any condition in process, equipment, material, fabrication or attachment that does not meet all the requirements of the specifications the Highway Tank is constructed to, or the requirements of this Quality Control Manual.

When a nonconformity or a quality control problem happens or is probable to happen, it will be reported to the national quality system manager, who makes sure the specified root cause analysis and the related corrective / preventive action(s) are taken to avoid repetition of the nonconformity.

### 14.1 Identification of Nonconformities

It is the duty of all employees to report non-conformities to their supervisors. Non-conforming condition shall be notified to the national quality system manager. All corrective actions start with an investigation to determine the root cause(s) of the problem. A thorough analysis of all related processes, operations, quality records, and specifications, which may have contributed to the deficiency, is conducted by the responsible personnel. All potential corrective actions are identified and the action(s) most likely to eliminate the problem and to prevent recurrence is selected. The investigation and analysis of the root cause and preventive measures shall be documented in Non Conformance Corrective and Preventative Action Report form (Form No. NEE-FRM-017). The analysis shall include review of all applicable data to determine the extent and cause of the problem and analysis of trends in processes or performance of work to prevent nonconformities.

All problems are evaluated in terms of potential impact on quality, performance, reliability, safety, and customer satisfaction. Resolutions to all corrective and preventive actions are to a degree appropriate to the magnitude and the risk of the problem. Resolutions are reviewed and approved by the national quality system manager **or** his designated representative.

### 14.2 Examples of Tank Nonconformities

- Routine maintenance Items when the non-conformity is of a routine maintenance nature (eg. leaking gasket, seized remote release, performed tests by an uncelebrated gauge, etc.)

- Any non-conformance that is discovered related to Test and Inspection activities shall be brought to the attention of the Process Owner. The non-conformance shall be reviewed.

### 14.3 Retest

Upon correction of any tank non-conformity, the tank shall be re-tested in accordance with the tank's requirements.

### 14.4 Calibrated Equipment

Any non-conformity discovered in the Calibrated Equipment shall be resolved in accordance with Section 16 (Calibration) of this Manual.

### 14.5 Reference

- NEE-FRM-017 Nonconformance corrective and preventative action report form (See 21.1)

## SECTION - 15 Welding control NA

## SECTION - 16 Calibration

### 16.1 General

All test and inspection equipment used in Inspection and Testing procedures of this Manual shall be calibrated in accordance with this section.

The Process Owner is responsible for maintaining all equipment in calibration.

Calibration may be performed by the Process Owner, or a qualified individual who has been assigned to the task and trained,

Pressure gauges or digital manometer used for pressure tests are calibrated to a certified calibrated master gauge weekly, or when there is reason to question their accuracy. The master gauge shall also be re-calibrated and re-certified annually and the certificate keep on file. All gauge calibrations shall be documented on the Gauge Calibration Log (Form No. NEE-FRM-014). All equipment calibrations shall be documented on the Equipment Calibration Log (Form No. NEE-FRM-015)

The frequency of calibration for other equipment is as recommended by the equipment manufacturer or from experience with the equipment.

When equipment requiring calibration is found to be out of calibration it shall be removed from the work area, fixed, re-calibrated or replaced.

All items checked without calibration equipment shall be considered as non-conforming until the Process Owner verifies that they meet all Specification requirements or, the items have been re-checked with appropriately calibrated equipment.

### 16.2 Procedure

Connect the gauge to be calibrated to the master gauge and pressure source.

Apply the pressure to the gauge to be calibrated in increments over the full range of the gauge.

Compare the value of pressure indicated by the master gauge with the corresponding value of the pressure indicated by the gauge being calibrated for each pressure increment. The values should be same.

If necessary, adjust the gauge and repeat the above paragraph until the both values are same.

After three trials, if the values are not same, the gauge is rejected and shall be removed from the work area.

### 16.3 References

- NEE-FRM-014 Gauge Calibration Log (See 21.1)
- NEE-FRM-015 Equipment Calibration Log (See 21.1)

## SECTION - 17 Quality Audits

### 17.1 General

National quality system manager is responsible for coordinating with Process Owners of facilities to plan a regular quality audit and closure corrective actions required to eliminate the recorded nonconformities based on the internal audits and the Non Conformance Corrective and Preventative Action Report form (From No.: NEE-FRM-017).

Forms and related documents which are listed in 'Mandatory document list' shall be completed in accordance with the related process.

Where these audits indicate that tanks may be out of compliance, those tanks shall be recalled and brought into conformance.

Where re-work is required, the effectiveness of the re-work shall be verified by performing the appropriate tests and inspections after work is completed.

Where these audits reveal repeated non-conformance, the relevant procedures in this manual shall be reviewed and where required, training initiated to eliminate non-conformance.

The national quality system manager shall annually review the complete process to ensure it is in conformance with this Quality Control Manual in the management review meeting. This meeting shall include but not limited to:

- Results of audits
- Facility Registration documents
- Material procurement and control
- Quality Control process performance
- Status of non conformities, preventive and corrective actions
- Follow-up actions from previous management review meeting
- Recommendations for improvement

### 17.2 References

- NEE-FRM-017 Nonconformance corrective and preventative action report (See 21.1)
- Mandatory Document List (See 21.1)

## SECTION - 18 Registration – Facilities and Personnel

### 18.1 Facility Registration

Facility registration is the responsibility of the National quality system manager (NQSM).

NQSM is responsible for ensuring the certificate of registration is current and covers all inspection, test and retest of highway tanks performed by the registered NEEI facility with the registration number of **25-xxxx**, located at **8909 Henri-Bourassa Blvd Est., Anjou, PQ, H1E 1P4**.

For the scope of the registered facility, refer to the section one (1) of this quality control manual.

### 18.2 Personnel Registration

It is the responsibility of the Process Owner to ensure that all personnel are qualified based on their experience and after a proper training. After verification of their qualifications, they will get the 'Certificate of qualification' for only those functions, which they have been qualified. Employee qualification records must be retained throughout the duration of employment and for five (5) years after the end of employment. The minimum qualification requirements of CSA B620 Clause 8 as follows:

Tank Inspector

Tank inspector shall have

(a) the knowledge and ability to determine if a tank conforms to a particular specification; and

(b) education and experience in the construction, inspection, testing, or retesting of tanks of that specification, as follows:

(i) an engineering degree or professional engineer status in a province of Canada, and one year of experience;

(ii) a technical diploma and two years of experience;

(iii) a high-school diploma and three years of experience; or

(iv) five years of experience or more.

Tester

Every tester shall

(a) be familiar with the specification tank on which the test is performed;

(b) be familiar with the test procedure and pass/fail criteria;

(c) have at least one year of experience performing the test; and

(d) be trained and experienced in the use of the testing equipment.

Every tester and inspector shall have training in product and hose safety, quality control manual, inspection/ test procedures, and the related rejection criteria.

### 18.3 References

- Certificate of qualification (See 21.1)

## SECTION - 19 Mobile Units

### 19.1 General

a) Mobile units and related equipment shall be controlled by the process owner from the registered facility **25-xxxx**, located at **8909 Henri-Bourassa Blvd Est., Anjou, PQ, H1E 1P4**.

b) All the documentation like records of Mobile Inspection and Testing shall be maintained and keep at the registered facility **25-xxxx**, located at **8909 Henri-Bourassa Blvd Est., Anjou, PQ, H1E 1P4**.
Note: documentation will be carried with the mobile unit too.

c) There is at least one dedicated enclosed field service mobile unit (Ford E350, Dodge R/T or trailer approximately 7 ft wide x 16 ft long) properly licensed with the provincial government.

### 19.2 Mobile Equipment

**a) Description of Equipment Carried with Service Unit**

- Laptop, used to record inspection
- Air compressor with lines and couplers
- Calibrated pressure gauges of approximate range
- Test fittings and adapters10” Fill Betts Test Lid Hose tester
- Hydrostatic pressure test pump
- Soap solution / spray bottles
- Ladder (to reach top of tank)
- Harness and safety tie for ladder
- TANK UNDER PRESSURE Sign x 2
- Hose Inspection tags and Tank Inspection stickers
- Measuring tape, brushes, flash lights, zip ties
- Basic hand tools (wrenches, screwdrivers, etc.)
- Other general tools

Aforementioned equipment shall be stored in a waterproof equipment case, but the equipment maybe transferred to a different container depending on transporting requirements.

**b) Description of Customer Equipment and Services in the field necessary for the mobile unit to function**

- Water is required for the hose testing.
- Pressure washer might be required in case that the inspector found an uncleaned spot on the tank. Please note that tanks shall be cleaned by the customer or its subcontractor.

-

## SECTION - 20 Records Retention

### 20.1 General

Records referred to in this manual may be maintained and stored electronically.

The Process Owner shall review all records referred to in this manual for completeness prior to filing.

All following records shall be retained on NEEI property for a period of at least 20 years. They shall be circulated as described in the documents, where applicable.

1) Copy of the identification plate by the facility installing the plate
2) Inspection and test reports by the inspector or tester facility
3) Hose test reports,
4) Calibration records,

The national quality system manager is responsible for ensuring that above mentioned records, quality control manual, certificates and other related documents required by CSA B620 and applicable codes are properly circulated and retained for the required periods.

In the event of a change in ownership, retention by the prior Owner of non-fading copies of the records shall be deemed to satisfy the requirements of the above mentioned items.

The Job File, with all contents, shall be delivered at the time of sale by the seller of a tank to the purchaser, with non-fading copies of the contents being retained by the seller.

The Owner and the motor carrier, if they are not the Owner must each retain a copy of the test and inspection reports until the next major inspection.

On delivery of a tank, a copy of the test and inspection report (Form No.: NEE-FRM-007), Hose assembly test and inspection report (Form No.: NEE-FRM-012) shall be provided to the Owner or Owner's designate, who shall retain them throughout the ownership of the tank and for at least one year thereafter.

### 20.2 References

| | | | |
|---|---|---|---|
| - | NEE-FRM-007-406 | Test and Inspection Report for TC406/TC(MC)306 tanks | (See 21.1) |
| - | NEE-FRM-007-407 | Test and Inspection Report for TC407/TC(MC)307 tanks | (See 21.1) |
| - | NEE-FRM-007-331 | Test and Inspection Report for TC(MC)331 tanks | (See 21.1) |
| - | NEE-FRM-012 | Hose assembly test and inspection report | (See 21.1) |

## SECTION - 21 Exhibits

### 21.1 Reference forms and documents

| | | |
|---|---|---|
| 21.1.1 | NEE-FRM-007-406 | Test and Inspection Report for TC406/TC(MC)306 tanks |
| 21.1.2 | NEE-FRM-007-407 | Test and Inspection Report for TC407/TC(MC)307 tanks |
| 21.1.3 | NEE-FRM-007-331 | Test and Inspection Report for TC(MC)331 tanks |
| 21.1.4 | NEE-FRM-012 | Hose assembly test and inspection report |
| 21.1.5 | NEE-FRM-014 | Gauge Calibration Log |
| 21.1.6 | NEE-FRM-015 | Equipment Calibration Log |
| 21.1.7 | NEE-FRM-017 | Nonconformance corrective and preventative action report |
| 21.1.8 | Mandatory Document List | |
| 21.1.9 | Certificate of qualification | |
| 21.1.10 | Table 7.1 of CSA B620 | Periodic inspection and test intervals |
| 21.1.11 | Table 7.3 of CSA B620 | Pressures for periodic retesting |
| 21.1.12 | Required information on the Identification Plate checklist | |

**21.1.1**

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC406/TC(MC)306 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-406** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No.: **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No.: _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

EXTERNAL VISUAL INSPECTION "V"

| Item inspected | QC Man. Ref. | Complies | Reject | Retest Complies |
|---|---|---|---|---|
| Data plate and other markings, present and legible | 12.2 | ☐ | ☐ | ☐ |
| Shell & Heads corrosion, abrasion, dents, overlay patches, leaks, defect welds, loose bolts and nuts on any flanged/blank connection, etc. | 12.2 | ☐ | ☐ | ☐ |
| Structural members, outriggers, cross members etc. | 12.2 | ☐ | ☐ | ☐ |
| Piping and valves for leakage, damage, corrosion | 12.2 | ☐ | ☐ | ☐ |
| Remote closures, thermal devices | 12.2 | ☐ | ☐ | ☐ |
| Hoses for defects, identification and test dates | 12.2 | ☐ | ☐ | ☐ |
| Tank attachments to frame or running gear, elements of the UC assembly area that can be inspected without dismantling | 12.2 | ☐ | ☐ | ☐ |
| All switches and valves, work properly | 12.2 | ☐ | ☐ | ☐ |
| Ladders, walkways, trop of the tank, and etc. | 12.2 | ☐ | ☐ | ☐ |
| Fill covers, manways and closure devices, are operative and leaktight | 12.2 | ☐ | ☐ | ☐ |
| Relief valves and vents inspected and properly operative (replace or test if tank in service where lading corrosive to relief device) | 12.2 | ☐ | ☐ | ☐ |
| Accident damage protection | 12.2 | ☐ | ☐ | ☐ |

Inspector_____ Signature_____ Date_____ After Retest Signature and Date _____ _____

**Note: Rejection Criteria for External Visual Inspections**

Less than minimum material thickness under any cut, dig or gouge
Any dent with a depth greater than ½" where it includes a weld
Any dent with a depth greater than 10% of the length of the dent
Any weld defect including a crack, pinhole, or incomplete fusion of the weld
Any structural defect
Any source of leakage
Any repairs made to liquid-retaining components using overlay patches
Defective, unidentified or out of test Hose Assemblies

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC406/TC(MC)306 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-406** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No. **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No. _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

LEAKAGE TEST "K" (QC Manual Reference 12.5)

TEST PRESSURE _____ (80% of MAWP MIN) TEST MEDIUM _____

| Item Tested | Pass | Fail | Retest Complies | Item Tested | Pass | Fail | Retest Complies |
|---|---|---|---|---|---|---|---|
| Compartment No. 1 | ☐ | ☐ | ☐ | Compartment No. 1 piping | ☐ | ☐ | ☐ |
| Compartment No. 2 | ☐ | ☐ | ☐ | Compartment No. 2 piping | ☐ | ☐ | ☐ |
| Compartment No. 3 | ☐ | ☐ | ☐ | Compartment No. 3 piping | ☐ | ☐ | ☐ |
| Compartment No. 4 | ☐ | ☐ | ☐ | Compartment No. 4 piping | ☐ | ☐ | ☐ |
| Compartment No. 5 | ☐ | ☐ | ☐ | Compartment No. 5 piping | ☐ | ☐ | ☐ |
| Compartment No. 6 | ☐ | ☐ | ☐ | Compartment No. 6 piping | ☐ | ☐ | ☐ |

Tank tester_____ Signature_____ Date_____ After Retest Signature and Date _____

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC406/TC(MC)306 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-406** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No. **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No.: _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

INSPECTION AND TEST CONCLUSION:

TESTS PERFORMED "V" ☐ "K" ☐

No defect or damage was discovered on tank YES ☐ NO ☐

Description of the location, nature, and severity of damage or defects found, how they were discovered, and the nature of any fixing or replacement, and the results of any subsequent test or inspection

| |
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Tank successfully retested after fixing YES ☐ NO ☐ N/A ☐
Expired Inspection Markings removed YES ☐ NO ☐
TANK DISPOSITION Removed from Service ☐
Safety Mark (Specification Indication) removed ☐
Returned to Service ☐
Inspection Markings applied YES ☐ NO ☐

FAILED INSPECTION ☐ PASSED INSPECTION ☐

**Inspector**_____ **Signature**_____ **Date**_____

**21.1.2**

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC407/TC(MC)307 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-407** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No.: **25-**

Tank Owner: _____
Address: _____
Telephone: _____

OWNERS UNIT No: _____ SERIAL No.: _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

EXTERNAL VISUAL INSPECTION "V"

| Item inspected | QC Man. Ref. | Complies | Reject | Retest Complies |
|---|---|---|---|---|
| Data plate and other markings, present and legible | 12.2 | ☐ | ☐ | ☐ |
| Shell & Heads corrosion, abrasion, dents, overlay patches, leaks, defect welds, loose bolts and nuts on any flanged/blank connection, etc. | 12.2 | ☐ | ☐ | ☐ |
| Structural members, outriggers, cross members etc. | 12.2 | ☐ | ☐ | ☐ |
| Piping and valves for leakage, damage, corrosion | 12.2 | ☐ | ☐ | ☐ |
| Remote closures, thermal devices | 12.2 | ☐ | ☐ | ☐ |
| Hoses for defects, identification and test dates | 12.2 | ☐ | ☐ | ☐ |
| Tank attachments to frame or running gear, elements of the UC assembly area that can be inspected without dismantling | 12.2 | ☐ | ☐ | ☐ |
| All switches and valves, work properly | 12.2 | ☐ | ☐ | ☐ |
| Ladders, walkways, trop of the tank, and etc. | 12.2 | ☐ | ☐ | ☐ |
| Fill covers, manways and closure devices, are operative and leaktight | 12.2 | ☐ | ☐ | ☐ |
| Relief valves and vents inspected and properly operative (replace or test if tank in service where lading corrosive to relief device) | 12.2 | ☐ | ☐ | ☐ |
| For insulated tanks, check outer jacket for the condition of attachments dents, digs, scrapes, gouge, loose sheets and fastening devices | 12.2 | ☐ | ☐ | ☐ |
| Accident damage protection | 12.2 | ☐ | ☐ | ☐ |

Inspector_____ Signature_____ Date_____ After Retest Signature and Date _____

**Note: Rejection Criteria for External Visual Inspections**

Less than minimum material thickness under any cut, dig or gouge
Any dent with a depth greater than ½" where it includes a weld
Any dent with a depth greater than 10% of the length of the dent
Any weld defect including a crack, pinhole, or incomplete fusion of the weld
Any structural defect
Any source of leakage
Any repairs made to liquid-retaining components using overlay patches
Defective, unidentified or out of test Hose Assemblies

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC407/TC(MC)307 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-407** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No. **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No. _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

LEAKAGE TEST "K" (QC Manual Reference 12.5)

TEST PRESSURE _____ (80% of MAWP MIN) TEST MEDIUM _____

| Item Tested | Pass | Fail | Retest Complies | Item Tested | Pass | Fail | Retest Complies |
|---|---|---|---|---|---|---|---|
| Compartment No. 1 | ☐ | ☐ | ☐ | Compartment No. 1 piping | ☐ | ☐ | ☐ |
| Compartment No. 2 | ☐ | ☐ | ☐ | Compartment No. 2 piping | ☐ | ☐ | ☐ |
| Compartment No. 3 | ☐ | ☐ | ☐ | Compartment No. 3 piping | ☐ | ☐ | ☐ |
| Compartment No. 4 | ☐ | ☐ | ☐ | Compartment No. 4 piping | ☐ | ☐ | ☐ |
| Compartment No. 5 | ☐ | ☐ | ☐ | Compartment No. 5 piping | ☐ | ☐ | ☐ |
| Compartment No. 6 | ☐ | ☐ | ☐ | Compartment No. 6 piping | ☐ | ☐ | ☐ |

Tank tester_____ Signature_____ Date_____ After Retest Signature and Date _____ _____

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC407/TC(MC)307 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-407** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No. **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No.: _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

INSPECTION AND TEST CONCLUSION:

TESTS PERFORMED "V" ☐ "K" ☐

No defect or damage was discovered on tank YES ☐ NO ☐

Description of the location, nature, and severity of damage or defects found, how they were discovered, and the nature of any fixing or replacement, and the results of any subsequent test or inspection

Tank successfully retested after fixing YES ☐ NO ☐ N/A ☐
Expired Inspection Markings removed YES ☐ NO ☐
TANK DISPOSITION Removed from Service ☐
Safety Mark (Specification Indication) removed ☐
Returned to Service ☐
Inspection Markings applied YES ☐ NO ☐

FAILED INSPECTION ☐ PASSED INSPECTION ☐

**Inspector**_____ **Signature**_____ **Date**_____

**21.1.3**

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC(MC)331 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-331** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No.: **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No.: _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

It is constructed of quenched and tempered steel (QT)☐ or other than quenched and tempered steel (NQT)☐

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

EXTERNAL VISUAL INSPECTION "V"

| Item inspected | QC Man. Ref. | Complies | Reject | Retest Complies |
|---|---|---|---|---|
| Data plate and other markings, present and legible | 12.2 | ☐ | ☐ | ☐ |
| Shell & Heads corrosion, abrasion, dents, overlay patches, leaks, defect welds, loose bolts and nuts on any flanged/blank connection, etc. | 12.2 | ☐ | ☐ | ☐ |
| Structural members, outriggers, cross members etc. | 12.2 | ☐ | ☐ | ☐ |
| Piping and valves for leakage, damage, corrosion | 12.2 | ☐ | ☐ | ☐ |
| Remote closures, thermal devices | 12.2 | ☐ | ☐ | ☐ |
| Hoses for defects, identification and test dates | 12.2 | ☐ | ☐ | ☐ |
| Tank attachments to frame or running gear, elements of the UC assembly area that can be inspected without dismantling | 12.2 | ☐ | ☐ | ☐ |
| Inspect underneath tank for dents, corrosion, leaks, cracks on outriggers / cross members, make sure voids are not capped, pipes for dents/rubbing, hydraulics, excessive play in PTO shaft (check or shear section on Outlet valve) | 12.2 | ☐ | ☐ | ☐ |
| Inspect on top of tank for dents, corrosion, fall protection functions (if equipped), anti-slip grating insecure or wearing tank, obvious signs of leakage, | 12.2 | ☐ | ☐ | ☐ |
| All switches and valves, work properly | 12.2 | ☐ | ☐ | ☐ |
| Ladders, walkways, trop of the tank, and etc. | 12.2 | ☐ | ☐ | ☐ |
| Fill covers, manways and closure devices, are operative and leaktight | 12.2 | ☐ | ☐ | ☐ |
| Relief valves and vents inspected and properly operative (replace or test if tank in service where lading corrosive to relief device) | 12.2 | ☐ | ☐ | ☐ |
| Accident damage protection | 12.2 | ☐ | ☐ | ☐ |

Inspector_____ Signature_____ Date_____ After Retest Signature and Date _____

**Note: Rejection Criteria for External Visual Inspections**

Less than minimum material thickness under any cut, dig or gouge
Any dent with a depth greater than ½" where it includes a weld
Any dent with a depth greater than 10% of the length of the dent
Any weld defect including a crack, pinhole, or incomplete fusion of the weld
Any structural defect
Any source of leakage
Any repairs made to liquid-retaining components using overlay patches
Defective, unidentified or out of test Hose Assemblies

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC(MC)331 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-331** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No.: **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No. _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

It is constructed of quenched and tempered steel (QT) ☐ or other than quenched and tempered steel (NQT) ☐

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

TEST OF EMERGENCY DISCHARGE CONTROL

| Item inspected | QC Man. Ref. | Complies | Reject | Retest Complies |
|---|---|---|---|---|
| Have Emergency discharge controls, except designed to transport Class 2.2, non-flammable and non-toxic gases. | 12.2 | ☐ | ☐ | ☐ |
| For tanks with more than 13,250L capacity, inspect and test off-truck emergency shut down system and either 'a monitoring feature' or 'a passive emergency shutdown system',<br>For tanks that are 13,250L or less, inspect and test off-truck emergency shutdown system.<br>With product running at normal flow rate throughout the metering system, activate the off-truck Emergency shutdown system. The meter should stop the flow and close the internal self closing (ISC) valve within 30 seconds or sooner. No meter creep after 5 seconds. The same process shall be used on both ON and OFF truck applications.<br>For non-metered tanks, all internal self closing (ISC) valves shall be open. Each emergency discharge control remote actuator (on- truck and off truck) shall be operated to ensure each ISC valve indicator has moved to the closed position. Once all ISC valves are closed, all of the material in the downstream piping shall be evacuated, and the piping shall be returned to atmospheric temperature and pressure. The outlet shall then be monitored for 30 seconds to ensure that there is no detectable leakage. | 12.2 | ☐ | ☐ | ☐ |
| When the Emergency shutdown has been activated, the ISC cannot be reactivated remotely. | 12.2 | ☐ | ☐ | ☐ |
| The emergency shut down system shall function reliably at a distance of 46 m (150ft). | 12.2 | ☐ | ☐ | ☐ |

Tank tester_____ Signature_____ Date_____ After Retest Signature and Date _____ _____

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC(MC)331 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-331** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No. **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No. _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

It is constructed of quenched and tempered steel (QT)☐ or other than quenched and tempered steel (NQT)☐

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

LEAKAGE TEST "K" (QC Manual Reference 12.5)

TEST PRESSURE _____ (80% of MAWP MIN) TEST MEDIUM _____
The test pressure shall be the maximum normal operating pressure of the tank and no less than 60 PSI

| Item Tested | Pass | Fail | Retest Complies | Item Tested | Pass | Fail | Retest Complies |
|---|---|---|---|---|---|---|---|
| Compartment No. 1 | ☐ | ☐ | ☐ | Compartment No. 1 piping | ☐ | ☐ | ☐ |
| Compartment No. 2 | ☐ | ☐ | ☐ | Compartment No. 2 piping | ☐ | ☐ | ☐ |
| Compartment No. 3 | ☐ | ☐ | ☐ | Compartment No. 3 piping | ☐ | ☐ | ☐ |
| Compartment No. 4 | ☐ | ☐ | ☐ | Compartment No. 4 piping | ☐ | ☐ | ☐ |
| Compartment No. 5 | ☐ | ☐ | ☐ | Compartment No. 5 piping | ☐ | ☐ | ☐ |
| Compartment No. 6 | ☐ | ☐ | ☐ | Compartment No. 6 piping | ☐ | ☐ | ☐ |

Tank tester_____ Signature_____ Date_____ After Retest Signature and Date _____

| NATIONAL ENERGY EQUIPMENT INC. | **Test and Inspection Report For TC(MC)331 tanks** |
|---|---|
| **Form Number:NEE-FRM-007-331** | **Revision: 1** |

Facility Name: National Energy Equipment Inc.
Address: TEST DATE: _____

Telephone: Fax: Facility Registration No. **25-**

Tank Owner: _____
Address: _____
_____
Telephone:

OWNERS UNIT No: _____ SERIAL No.: _____
MANUFACTURER: _____ MAWP: _____
CERT. DATE: _____ MATERIAL: _____ TANK SPEC: _____

It is constructed of quenched and tempered steel (QT) ☐ or other than quenched and tempered steel (NQT) ☐

COMP. CAPACITY 1 _____ IG/L 2 _____ IG/L 3 _____ IG/L
4 _____ IG/L 5 _____ IG/L 6 _____ IG/L

INSPECTION AND TEST CONCLUSION:

TESTS PERFORMED "V" ☐ "K" ☐

No defect or damage was discovered on tank YES ☐ NO ☐

| Description of the location, nature, and severity of damage or defects found, how they were discovered, and the nature of any fixing or replacement, and the results of any subsequent test or inspection |
|---|
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Tank successfully retested after fixing YES ☐ NO ☐ N/A ☐
Expired Inspection Markings removed YES ☐ NO ☐
TANK DISPOSITION Removed from Service ☐
Safety Mark (Specification Indication) removed ☐
Returned to Service ☐
Inspection Markings applied YES ☐ NO ☐

FAILED INSPECTION ☐ PASSED INSPECTION ☐

**Inspector**_____ **Signature**_____ **Date**_____

**21.1.4**

| NATIONAL ENERGY EQUIPMENT INC. | Hose assembly test and inspection report |
|---|---|
| Form Number:NEE-FR-L-012 | Revision: 0 |

FACILITY NAME: TEST DATE:

ADDRESS:

FACILITY REG. NO.:

HOSE OWNER:

UNIT #

ADDRESS:

| HOSE SERIAL # | | | |
|---|---|---|---|
| **VISUAL INSPECTION** | **COMPLIES** | **COMPLIES** | **COMPLIES** |
| EXPOSED REINFORCEMENT | ☐ YES ☐ NO | ☐ YES ☐ NO | ☐ YES ☐ NO |
| KINKED, FLATTENED OR PERMANENTLY DEFORMED WIRE BRAID | ☐ YES ☐ NO | ☐ YES ☐ NO | ☐ YES ☐ NO |
| SOFT SPOTS WHEN NOT UNDER PRESSURE, BULGING UNDER PRESSURE OR LOOSE OUTER COVERING | ☐ YES ☐ NO | ☐ YES ☐ NO | ☐ YES ☐ NO |
| DAMAGED, SLIPPING OR EXCESSIVELY WORN HOSE COUPLINGS | ☐ YES ☐ NO | ☐ YES ☐ NO | ☐ YES ☐ NO |
| LOOSE OR MISSING BOLTS OR FASTENINGS ON BOLTED HOSE COUPLING ASSEMBLIES | ☐ YES ☐ NO | ☐ YES ☐ NO | ☐ YES ☐ NO |
| DETERIORATED LEGIBILITY OR ABSENCE OF SERIAL OR ID NUMBER OR HAWP | ☐ YES ☐ NO | ☐ YES ☐ NO | ☐ YES ☐ NO |

**HOSE PRESSURE TEST**

| HOSE SERIAL # | HAWP (PSI) | TEST PRESSURE (PSI) | TEST MEDIUM | PASS | FAIL |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

DESCRIPTION OF DEFECTS FOUND AND METHODS USED TO REPAIR:

TESTER NAME:

SIGNATURE:

DATE:

**21.1.5**

| NATIONAL ENERGY EQUIPMENT INC. | **Gauge Calibration Log** |
|---|---|
| **Form Number:NEE-FR-L-014** | **Revision: 0** |

Mobile gauges for B620

| Gauge # | Date | Method | Pass | Fail | Next Due Date | Job |
|---|---|---|---|---|---|---|
| | | | | | | |
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1-15 PSI gauges are to be used.

**21.1.6**

| NATIONAL ENERGY EQUIPMENT INC. | Equipment Calibration Log |
|---|---|
| Form Number:NEE-FR-L-015 | Revision: 0 |

| I.D. Number | Description | Calibration Date | Due Date | Calibrated By | Result |
|---|---|---|---|---|---|
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**21.1. 7**

| NATIONAL ENERGY EQUIPMENT INC. | Nonconformance corrective and preventative action report form |
|---|---|
| Form Number:NEE-FR-L-017 | Revision: 0 |

| Type of action/Status | | | |
|---|---|---|---|
| Corrective Action | | Preventive Action | |

| | |
|---|---|
| Job # | |
| Issued To | |
| Reference Highway Tank/ Portable Tank | |
| Reference Area/Process | |
| Documents | |

| Name of Initiator: | Signature: | Date: |
|---|---|---|
| | | |

| Nonconformity |
|---|
| Description of Nonconformity: |

| Root Cause | | |
|---|---|---|
| Corrective Action | | Preventive Action |
| Determination of Root Cause: | | |
| Description of Implemented Action: | | |
| Signature: | Position/Title: | Date: |

| Evidence Reviewed and Conclusions | |
|---|---|
| Follow up | And Close |
| Is the action implemented? | |
| Is the Action Effective? | |

**21.1.8**

**Mandatory Document List**

- NEE-FRM-007-406 Test and Inspection Report for TC406/TC(MC)306 tanks
  Related Section:12 Inspection and testing - examination
- NEE-FRM-007-407 Test and Inspection Report for TC407/TC(MC)307 tanks
  Related Section:12 Inspection and testing - examination
- NEE-FRM-007-331 Test and Inspection Report for TC(MC)331 tanks
  Related Section:12 Inspection and testing – examination
- NEE-FRM-012 Hose Assembly Test and Inspection Report
  Related Section:12 Inspection and testing - examination
- NEE-FRM-014 Gauge Calibration Log
  Related Section:16 Calibration
- NEE-FRM-015 Equipment Calibration Log
  Related Section:16 Calibration
- NEE-FRM-017 Nonconformance corrective and preventative action report
  Related Section: 14 Nonconformities - Corrective action, 17 Quality audits

**21.1.9**


NATIONAL ENERGY EQUIPMENT INC.
CERTIFICATE of QUALIFICATION
THIS ACKNOWLEDGES THAT
XXXXXXX
HAS QUALIFAIED AS
☑Tester ☑Tank Inspector ☑Welder (ID No.: xxxx )
Uunder Quality Control Manual for Highway and TC
Portable Tanks for The TDG (B620 Program)
C
ustomer Is #1
A
ccountable & Motivated People
N
ever Compromise Service
D
o it Now! Do It Right! Do it Safe!
O
ur Energy Is Everything
MM YYYY
SIGNED, Zanyar Farhadi, National Quality Systems Manager

**21.1.10**

**Table 7.1 of CSA B620 Periodic inspection and test intervals**

*(See Clauses 7.1.1, C.1, C.2, and C.6 of CSA-B620.)*

| Description of tank | Clause 7.2.1 External inspection | Clause 7.2.2 Internal inspection[1] | Clause 7.2.3 Lining inspection | Clause 7.2.5 Leakage test | Clause 7.2.7 Pressure test, hydrostatic or pneumatic | Clause 7.2.11 Structural inspection |
|---|---|---|---|---|---|---|
| TC 306 or TC 406 tanks | 1 year | 5 years[2] | — | 1 year | 5 years[3] | — |
| TC 306 Crude or TC 406 Crude tanks | 2.5 years | 5 years | — | 2.5 years | 5 years[3] | |
| TC 307 or TC 407 tanks | 1 year | 5 years | — | 1 year | 5 years | — |
| TC 312 or TC 412 tanks | 1 year | 5 years | — | 1 year | 5 years[3] | — |
| TC 423 tanks | 1 year | 1 year | — | 1 year | 5 years | 5 years |
| TC 350 tanks | 6 months | 1 year | — | 1 year | 2 years | — |
| TC 350 Crude tanks | 1 year | 1 year | — | 1 year | 2 years | — |
| TC 331 tanks | 1 year | 5 years | — | 1 year[4] | 5 years[4] | — |
| TC 338 tanks | 1 year | — | — | — | 5 years | — |
| TC 341 tanks[5] | 1 year | 10 years | — | — | 10 years | — |
| TC 11 portable tanks | 1 year | 10 years[6] | — | 1 year | 5 years | — |
| TC 44 portable tanks | 1 year | 5 years | — | 1 year | 5 years | — |
| TC 51 portable tanks[9] | 2.5 years[7] | 5 years | 5 years | — | 5 years | — |
| TC 56 and 57 portable tanks[8] | 2.5 years | — | — | — | 2.5 years | — |
| TC 60 portable tanks | 2 years | Initial: 4 years<br>Next 8 years: every 2 years<br>After 12 years: annually | Initial: 4 years<br>Next 8 years: every 2 years<br>After 12 years: annually | | Initial: 4 years<br>Next 8 years: every 2 years<br>After 12 years: annually | — |

***Notes:***

(1) Where a tank, other than a TC 341 tank, is not equipped with a manhole or inspection ports, a hydrostatic or pneumatic pressure test shall be performed at the interval for internal inspections. See also Note 5.

(2) Highway tanks used only to refuel aircraft and that operate only on airport property shall be exempt from internal inspection, provided that they are clearly marked "Restricted to Use on Airport Property" in letters not less than *25 mm* (1 in) high in a contrasting colour on each side of the tank where they will be clearly visible from the ground.

(3) For TC 306, TC 406, TC 306 Crude, TC 406 Crude, TC 312, or TC 412 tanks, the pressure tests specified in Clause 7.2.7 shall not be required for uninsulated lined tank trucks and trailers with a design pressure or MAWP of *103 kPa* (15 psi) or less, if an external inspection and a lining inspection have been performed annually.

(4) TC 331 tanks in chlorine service shall be leak tested as specified in Clause 7.2.5 and pressure tested as specified in Clause 7.2.7 every two years. Pressure tests shall not be required on TC 331 tanks when in sodium metal service.

(5) As an alternative to the inspection and test requirements of this Table for TC 341 tanks, owners may perform the tests and inspections described in Annex C.

(6) The internal inspections specified in Clause 7.2.2 do not apply to TC 11 tanks that are less than 2350 L (620 US gal) and that do not have inspection openings.

(7) The external inspection period may be extended to 3 years following a pressure test for tanks described in CSA B622, Clause 6.3, Specific Requirement 55.

(8) TC 56 and TC 57 tanks shall be inspected and retested in accordance with Section 7 of CAN/CGSB-43.146.

(9) A TC 51 portable tank that is loaded and off-loaded without being removed from the vehicle shall be inspected and tested according to the requirements for TC 331 tanks specified in this Table.

(10) The pressure test period for tanks described in CSA B622, Clause 6.3, Specific Requirement 54 and Specific Requirement 55, is three years

(11) TC 331 and TC 51 tanks shall be subjected to an internal inspection by the wet fluorescent magnetic particle method in accordance with Clause 7.2.8 when the conditions of Clause 7.2.8(a) are met.

**21.1.11**

**Table 7.3 of CSA B620 Test pressures**

(See Clauses 5.2.5, 5.5.2.4, 7.2.7.7, and 7.2.7.8.)

| Tank specification | Pressure, kPa (psi) |
|---|---|
| TC 306 or MC | 21 kPa (3 psi) or design pressure, whichever is greater |
| TC 307 or MC 307 | 275 kPa (40 psi) or 1.5 × design pressure, whichever is greater |
| TC 312 or MC 312 | 21 kPa (3 psi) or 1.5 × design pressure, whichever is greater |
| TC 331, MC 330, or MC 331 | 1.5 × design pressure |
| TC 406 | 34.5 kPa (5 psi) or 1.5 × MAWP, whichever is greater |
| TC 407 | 275.8 kPa (40 psi) or 1.5 × MAWP, whichever is greater |
| TC 412 | 1.5 × MAWP |
| TC 423 | 1.5 × MAWP |
| TC 338 | According to calculation in Clause 5.2.5 |
| TC 341 | According to calculation in Clause 5.5.2.4 |
| TC 350 | 155 kPa (22.5 psi) or 1.5 × MAWP, whichever is greater |
| TC 11 | According to calculation in Clause 6.4.11(c) |
| TC 44 | 27 kPa (4 psi) or 1.5 × MAWP, whichever is greater |
| TC 51 or DOT 51 | 1.5 × design pressure |
| TC 60 or DOT 60 | 415 kPa (60 psi) |
| TC Type 1, 2, and 3 | 1.5 × MAWP |

**21.1.12**

## Required information on the Identification Plate checklist

The following information shall appear on the plate(s) (parenthetical abbreviations are authorized):
**Note:** *This information may be provided and marked in accordance with the ASME* Code.

(a) tank manufacturer (Tank mfr.);
(b) date of tank manufacture — month and year (Date of mfr.);
(c) assembler;
(d) completion and certification date — month and year (Cert. date);
(e) original test date — month and year (Orig. Test Date);
(f) TC Specification (TC Spec.);
(g) Transport Canada Registration Number (TCRN);(1)
(h) Manufacturer's Design Identification Number (MDIN);(2)
(i) tank serial number (Ser. No. or S/N);
(j) vehicle identification number (VIN);
(k) tank maximum allowable working pressure in kPa (MAWP);
(l) tank test pressure in kPa (Test P);
(m) tank design temperature range — ___°C to ___°C (Design temp. range);
(n) maximum design density of lading — in kilograms per litre (Max. lading density);
(o) vessel material specification number(3) — all numbers to be marked where the material for the shell is different from the material for the heads (Shell & Head Matl. yyy zzz or Shell Matl. yyy zzz and Head Matl. yyy zzz, where "yyy" is replaced by the alloy designation and "zzz" by the alloy type);
(p) weld material (Weld Matl.);(3)
(q) minimum allowable thickness of shell — in millimetres (Min. shell thick.). When minimum shell thicknesses are not the same for different areas, mark variances (Top ..... Side..... Bottom.....);
(r) minimum allowable thickness of heads — in millimetres (Min. head thick.);
(s) manufactured thickness of shell — in millimetres (Mfd. shell thick.);(4)
(t) manufactured thickness of heads — in millimetres (Mfd. head thick.);(4)
(u) exposed surface area — in square metres;
(v) volumetric capacity — in litres (Cap. Litres);
(w) maximum product load — in kilograms (Max. payload);
(x) maximum loading rate — in litres per minute and optionally in US gallons per minute [Max load. rate, L/min (US GPM) at maximum loading pressure XX kPa (psi)];(5)
(y) maximum unloading rate — in litres per minute and optionally in US gallons per minute [Max. unload. rate, L/min (US GPM) at maximum unloading pressure XX kPa (psi)];(5)

**Annotations**:
(1)Required for all tanks including: (a) TC 331; (b) TC 407 with a MAWP greater than 240 kPa (35 psi) or designed to be loaded by vacuum,
(2)Required for all tanks other than those outlined in above.
(3)For FRP tanks, "NA" shall be marked.
(4)Required when additional material is provided for corrosion allowance
(5)Does not apply to TC 331 highway tanks.

## 21.2 Equipment, signs and decals

Equipment:

Test Gauge Calibration Devices:

- 15# Gauge
- 300# Gauge
- Air Pressure Regulator
- Hose Testing Test Tee

10” Fill Test Fixture

16” and 20” Manway Bench Test Fixture

12”x16” Elliptical Manhole Bench Test Adapter
r

Hydrostatic Test Pump

Assorted Hose Test Adapters

Air Compressor


Tank Under Pressure Signs


Test and Inspection Decals

Calibration Decal

# CALIBRATION

Date: _____

Technician: _____

Due: _____

## 21.3 Samples of actual completed documents

The following documents are SAMPLES only. Latest quality control manual must be followed to complete the forms. Please refer to facilities' completed records for more samples.

**Test and Inspection Report in Accordance with CSA B620** *Page 1 of 3*

Facility Name: National Energy Equipment Inc
Address: XXXXXXX,
TEST D. XXXXXXX, 15
Telephon XXXX 477
Facility Registration : XX-XXX
Tank Ow John Doe
Address: XXXXXXXXX, XXXX
Owners Signature
Telephon 111111
Date:

OWNERS UNIT N : XXX
MANUFACTURE XXX
SERIAL No : XXX-XXX-XXX 5
MFG DATE: 11/89 MATERIAL: 5454 TANK SPEC: TC 306

MC/TC331 & TC51 QT ☐ NQT ☐ PWHT ☐

COMP. CAPACITY 1 2000 L IG/L 2 3600 L IG/L 3 5500 L IG/L
4 4500 L IG/L 5 2400 L IG/L 6 IG/L

**TESTS PERFORMED** "V" ☒ "I" ☒ "K" ☒ "P" ☒ "T" ☐ "U/C" ☐

EXTERNAL VISUAL INSPECTION "V"

| Item inspected | QC Man Ref. | Complies | Reject | Retest Complies |
|---|---|---|---|---|
| Data plate, present and legible | 8.1.3 | ☒ | ☐ | ☐ |
| Shell & Heads, corrosion abrasion dents overlay patches leaks etc | 8.1.4 | ☒ | ☐ | ☐ |
| Structural members, outriggers, crossmembers etc | 8.1.5 | ☐ | ☒ | ☒ |
| Piping and valves for leakage, damage, corrosion | 8.1.7 | ☒ | ☐ | ☐ |
| Remote closures, thermal devices | 8.1.7 | ☐ | ☒ | ☒ |
| Hoses for defects, identification and test dates | 8.1.8 | ☐ | ☒ | ☒ |
| Tank attachments to frame or running gear | 8.1.9 | ☒ | ☐ | ☐ |
| Ladders, walkways etc | 8.1.10 | ☒ | ☐ | ☐ |
| Fill covers, manways and closure devices | 8.1.11 | ☐ | ☒ | ☒ |
| Relief valves and vents (replace or test if tank in service where lading corrosive to relief device) | 8.1.12 | ☐ | ☒ | ☒ |
| Accident damage protection | 8.1.13 | ☒ | ☐ | ☐ |

Inspector- Tom T Signature Date- Nov 30 2015

INTERNAL VISUAL INSPECTION "I"

| Item inspected | QC Man Ref. | Complies | Reject | Retest Complies |
|---|---|---|---|---|
| Interior surface, corrosion, distortion overlay patches, cracking etc | 8.2.2 | ☒ | ☐ | ☐ |
| Interior welds for defects, cracking etc | 8.2.3 | ☒ | ☐ | ☐ |
| Internal supports and attachments | 8.2.4 | ☒ | ☐ | ☐ |
| Internal valves, piping and vents for leakage, damage, etc | 8.2.4 | ☐ | ☒ | ☒ |

Inspector- Tom T Signature Date- Nov 30 2015

**Note: Rejection Criteria for Visual Inspections**

Any of the following conditions shall cause the tank to be rejected

Less than minimum material thickness under any cut, dig or gouge
Any dent with a depth greater than ½" where it includes a weld
Any dent with a depth greater than 10% of the length of the dent
Any weld defect including a crack, pinhole, or incomplete fusion of the weld
Any structural defect or any source of leakage
Any repairs made using overlay patches
Defective, unidentified or out of test Hose Assemblies

## Test and Inspection Report in Accordance with CSA B620

*Page 2 of 3*

*UPPER COUPLER INSPECTION "U/C" (QC Manual Reference 8.1.5 and 8.1.6)*

| | Complies | Reject | Retest Complies |
|---|---|---|---|
| Upper coupler removed from tank and inspected (including tank areas above) | ☐ | ☐ | ☐ |
| Upper coupler inspected in place | ☐ | ☐ | ☐ |

Inspector- Signature_____ Date-

LEAKAGE TEST "K" (*QC Manual Reference 8.3*)

TEST PRESSURE 2.4 PSI (80% of MAWP MIN) TEST MEDIUM AIR

| Item Tested | Pass | Fail | Retest Complies | Item Tested | Pass | Fail | Retest Complies |
|---|---|---|---|---|---|---|---|
| Compartment No. 1 | ☒ | ☐ | ☐ | Compartment No. 1 piping | ☒ | ☐ | ☐ |
| Compartment No. 2 | ☐ | ☒ | ☒ | Compartment No. 2 piping | ☒ | ☐ | ☐ |
| Compartment No. 3 | ☐ | ☐ | ☐ | Compartment No. 3 piping | ☒ | ☐ | ☐ |
| Compartment No. 4 | ☒ | ☐ | ☐ | Compartment No. 4 piping | ☒ | ☐ | ☐ |
| Compartment No. 5 | ☒ | ☐ | ☐ | Compartment No. 5 piping | ☒ | ☐ | ☐ |
| Compartment No. 6 | ☐ | ☐ | ☐ | Compartment No. 6 piping | ☐ | ☐ | ☐ |

Tank Tester- Tom T Signature_____ Date- Nov 30 2015

THICKNESS TEST "T" (QC Manual Reference 8.5)

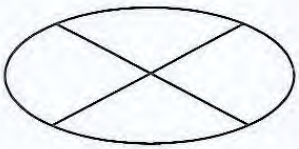
Thickness Tester Calibrated in accordance with instructions provided by the manufacturer of the testing device *YES* ☐ *NO* ☐

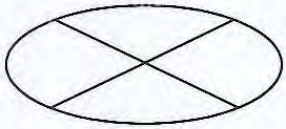
FRONT

| | 12:00 | 3:00 | 6:00 | 9:00 | |
|---|---|---|---|---|---|
| | | | | | HEAD |
| 1 | | | | | 1 |
| 2 | | | | | 2 |
| 3 | | | | | 3 |
| 4 | | | | | 4 |
| 5 | | | | | 5 |
| 6 | | | | | 6 |
| 7 | | | | | 7 |
| 8 | | | | | 8 |
| 9 | | | | | 9 |
| 10 | | | | | 10 |
| 11 | | | | | 11 |
| | | | | | HEAD |
| | 12:00 | 3:00 | 6:00 | 9:00 | |

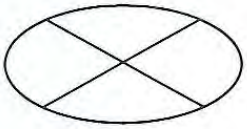
REAR

FRONT HEAD

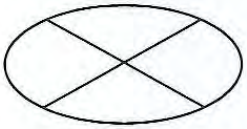




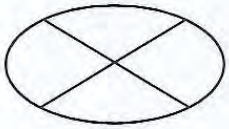
REAR HEAD



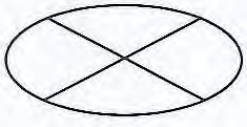
MANWAY



SUMP



NOZZLE



NOZZLE

Tank Tester- Signature_____ Date-

## Test and Inspection Report in Accordance with CSA B620

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PRESSURE TEST "P" (*QC Manual Reference 8.4)*

Test Pressure (Tank) 3 PSI
(Refer to Table 7.3 of CSA B620-2003 for appropriate test pressure)

Test Pressure (Piping) 2.4 PSI (80% Tank Test) Test Medium AIR

| Item Tested | Pass | Fail | Retest Complies | Item Tested | Pass | Fail | Retest Complies |
|---|---|---|---|---|---|---|---|
| Compartment No. 1 | ☒ | ☐ | ☐ | Compartment No. 1 piping | ☒ | ☐ | ☐ |
| Compartment No. 2 | ☐ | ☒ | ☒ | Compartment No. 2 piping | ☒ | ☐ | ☐ |
| Compartment No. 3 | ☒ | ☐ | ☐ | Compartment No. 3 piping | ☒ | ☐ | ☐ |
| Compartment No. 4 | ☒ | ☐ | ☐ | Compartment No. 4 piping | ☒ | ☐ | ☐ |
| Compartment No. 5 | ☒ | ☐ | ☐ | Compartment No. 5 piping | ☒ | ☐ | ☐ |

Tank Tester- Tom T Signature _____ Date- Nov 30 2015

| Description of defects found and methods used to repair |
|---|
| Hose out of date, retested good |
| Replace vents in all lids |
| Replace lids for out of spec |
| Weld cracks on left rear frame over rear ends |
| Repair emergency releace for internal valves |
| Repair roll over rail on right side for dents and cracks |
| |
| |
| |
| |
| |
| |

Tank successfully retested after repair YES ☒ NO ☐ N/A ☐

Written repair weld inspection report attached YES ☒ NO ☐ N/A ☐

TANK DISPOSITION Removed from Service ☐

Safety Mark (Specification Indication) removed YES ☐ NO ☒

Returned to Service ☒

TC/MC330/331 & TC 51 ONLY PWHT AFTER REPAIRS YES ☐ NO ☐ N/A ☒

IF YES FULL ☐ LOCAL ☐

Tank markings applied (QC Manual Reference Section 15) YES ☒ NO ☐

## SECTION - 22 Revision Control Sheet

| Page ↓ | Revision Number and Latest Issue Date | | | | | | | Page ↓ | Revision Number and Latest Issue Date | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| | Jan 2018 | Feb 2018 | | | | | | | Jan 2018 | Feb 2018 | | | | | |
| 1 | X | X | | | | | | 51 | X | X | | | | | |
| 2 | X | X | | | | | | 52 | X | X | | | | | |
| 3 | X | X | | | | | | 53 | X | X | | | | | |
| 4 | X | X | | | | | | 54 | X | X | | | | | |
| 5 | X | X | | | | | | 55 | X | X | | | | | |
| 6 | X | X | | | | | | 56 | X | X | | | | | |
| 7 | X | X | | | | | | 57 | X | X | | | | | |
| 8 | X | X | | | | | | 58 | X | X | | | | | |
| 9 | X | X | | | | | | 59 | X | X | | | | | |
| 10 | X | X | | | | | | 60 | X | X | | | | | |
| 11 | X | X | | | | | | 61 | X | X | | | | | |
| 12 | X | X | | | | | | 62 | X | X | | | | | |
| 13 | X | X | | | | | | 63 | X | X | | | | | |
| 14 | X | X | | | | | | 64 | X | | | | | | |
| 15 | X | X | | | | | | 65 | X | | | | | | |
| 16 | X | X | | | | | | 66 | | | | | | | |
| 17 | X | X | | | | | | 67 | | | | | | | |
| 18 | X | X | | | | | | 68 | | | | | | | |
| 19 | X | X | | | | | | 69 | | | | | | | |
| 20 | X | X | | | | | | 70 | | | | | | | |
| 21 | X | X | | | | | | 71 | | | | | | | |
| 22 | X | X | | | | | | 72 | | | | | | | |
| 23 | X | X | | | | | | 73 | | | | | | | |
| 24 | X | X | | | | | | 74 | | | | | | | |
| 25 | X | X | | | | | | 75 | | | | | | | |
| 26 | X | X | | | | | | 76 | | | | | | | |
| 27 | X | X | | | | | | 77 | | | | | | | |
| 28 | X | X | | | | | | 78 | | | | | | | |
| 29 | X | X | | | | | | 79 | | | | | | | |
| 30 | X | X | | | | | | 80 | | | | | | | |
| 31 | X | X | | | | | | 81 | | | | | | | |
| 32 | X | X | | | | | | 82 | | | | | | | |
| 33 | X | X | | | | | | 83 | | | | | | | |
| 34 | X | X | | | | | | 84 | | | | | | | |
| 35 | X | X | | | | | | 85 | | | | | | | |
| 36 | X | X | | | | | | 86 | | | | | | | |
| 37 | X | X | | | | | | 87 | | | | | | | |
| 38 | X | X | | | | | | 88 | | | | | | | |
| 39 | X | X | | | | | | 89 | | | | | | | |
| 40 | X | X | | | | | | 90 | | | | | | | |
| 41 | X | X | | | | | | 91 | | | | | | | |
| 42 | X | X | | | | | | 92 | | | | | | | |
| 43 | X | X | | | | | | 93 | | | | | | | |
| 44 | X | X | | | | | | 94 | | | | | | | |
| 45 | X | X | | | | | | 95 | | | | | | | |
| 46 | X | X | | | | | | | | | | | | | |
| 47 | X | X | | | | | | | | | | | | | |
| 48 | X | X | | | | | | | | | | | | | |
| 49 | X | X | | | | | | | | | | | | | |
| 50 | X | X | | | | | | | | | | | | | |

Signature:

Date:

x