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: 46A Haniak Road, Rosslyn Ontario P7K 0C8

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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:
46A Haniak Road, Rosslyn Ontario P7K 0C8	25-1239	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:

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Title: National Quality Systems Manager

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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 **25-1239**, located at **46A Haniak Road, Rosslyn Ontario P7K 0C8**, 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 306	M						M									

SECTION - 2 Glossary of Abbreviations and Definitions

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
Field welding	Any welding performed at locations other than the facility address
FRP	Fibre-reinforced plastic.
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.
"I"	The cargo tank marking that indicates an INTERNAL visual inspection
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.
"P"	lining the cargo tank marking that indicates a PRESSURE test
PSI	Pounds per square inch
Remount	Mounting a previously certified highway tank onto a different vehicle chassis or vehicle suspension component, or a change to the original means of securement or tank mounting system. A remount is a modification.
Repair	Returning a tank to its original design and specification by welding on the tank wall, on integral structural components of the tank such as the rollover dam, tank sill, or baffles, and on any components that contain lading. This term does not include: (a) changes to motor vehicle equipment, such as lights, truck or tractor power train components, steering and brake systems, and suspension parts; (b) changes to appurtenances, such as fender attachments, lighting brackets, and ladder brackets;

(c) replacement of components, such as valves, vents, or fittings, with components of a similar design and of the same size and capacity; and
(d) replacement of an attachment other than an integral structural component of the tank by welding to a mounting pad.

Retrofit	A change to a previously certified highway or portable tank that brings the tank into compliance with the latest revision of the specification to which the tank was originally constructed. Depending on the scope of the change, the retrofit can involve a modification of the highway or portable tank (see Modification).
SRV	Safety Relief Valve
"T"	The cargo tank marking that indicates a THICKNESS test
TC	Transport Canada
TDG	Transportation of dangerous goods
TCRN	Transport Canada Registration Number
UC	Upper Coupler
"V"	The cargo tank marking that indicates an EXTERNAL visual inspection
WPS	Weld Procedure Specification

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.

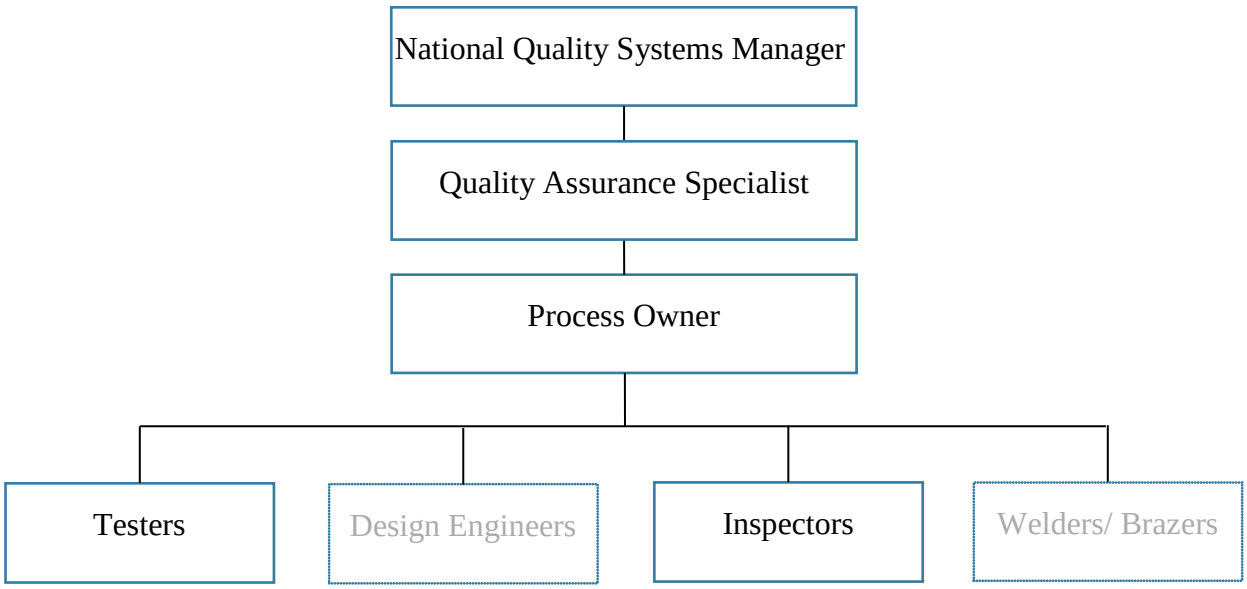
3-2 Codes and standards

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

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SECTION- 8 Assembly

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SECTION- 9 Modification

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SECTION- 10 Repairs N/A

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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 of all plants involved in the repair/modification. These shall include, but shall not be limited to the following:

a) Shop (Plant)

b) Quality Control Manual

c) Warehousing

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) Inspection prior to assembly of a new Tank, or reassembly of a modified tank,

5) Collecting the Manufacturer’s Partial Certificate of Compliance, plus any test reports generated during manufacture or modification, and verify that all functions have been completed.

6) Maintenance of reports and certificates 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.

Prior to any examination or inspection being performed, each tank shall be cleaned and decontaminated.

12.1 Inspection Program

All tanks shall be inspected and tested in accordance with CSA-B620 subject to the annotations to the tables. (Section 21.1)

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 tables 7.1 and 7.2 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.

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

1) a 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;

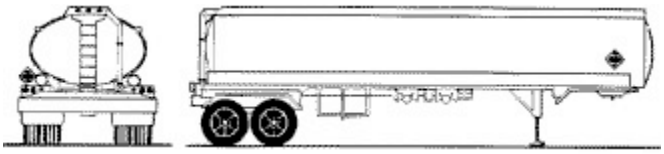
3) the tank has not been used for transporting dangerous goods for 1 year or more; or

4) the tank is new or modified from its original design, and the modification involves work on product-retaining components.

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)

TC406, Older version:TC306



Highway tank for flammable liquids and low hazard chemicals (e.g. gasoline, diesel);
Steel or aluminum shell or reinforced plastic (FRP tanks is not in the scope);
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) Corroded or abraded areas of the tank shell will be thickness tested.
   Measure with the thickness tester: 1. Remove rubber cap from probe; 2. Single drop of couplant (Gel) must be applied to the surface to be tested; 3. Zero the probe according to the manufacturer instructions; 4. Place the probe flat on the surface and use moderate pressure to press against the top of the probe with the thumb or index finger and read the result on the display, which shall be indicated on, or attached to the report.

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) All reclosing pressure relief valves (PRV):
   - Shall be externally inspected for any corrosion or damage that might prevent their safe operation.
   - On tanks that carry lading corrosive to the valves, either replace or test to ensure that they open at the required set to discharge pressure for the tank's MAWP and reseat 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) If upper coupler is due for removal, drop upper coupler and inspect areas covered by upper coupler for corrosion, abrasion dents, distortion, weld defects or any other condition that might render the tank unsafe. Inspect upper coupler area for cracks or distortions.
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, 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) The original metal identification plate in any condition shall not be removed.
18) NEEI Thunder Bay's Certificate of Registration does not include manufacture, assembly, modify, or repair on TC406/TC306 tank specifications. Therefore, NEEI Thunder Bay cannot stamp or install a replacement metal ID plate on a TC406/TC306 tank as outlined in clause 7.7.3.1 of CSA-B620-14.
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:

- When the thickness remaining under a cut, dig, or gouge is either below the minimum thickness specified on the nameplate; or
- 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) 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.

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

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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

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12.8 Product hose testing procedure

12.8.1 Scope

This procedure covers hose testing requirements in accordance to B620, Clause 7.2.10., and applies to hose assemblies connected to the tank or any tank-mounted accessory during loading or off-loading, but do not apply to hose assemblies less than 1.5 m (5 ft) in length that are part of the piping system and are pressure tested in accordance with Clause 7.2.7.

Hoses may be tested annually on or off the vehicle.

Hoses may be tested by other qualified hose testing organizations.

12.8.2 Frequency

All hoses shall be tested once per year

12.8.3 Safety

Hose testing shall be performed in a manner that ensures provisions will be made to protect personnel during testing in the event of a hose failure.

12.8.4 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.

12.8.5 Procedure

(a) A hose assembly having any damage identified in Clause 7.2.10.4 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 vacuum hose assemblies on tanks loaded by vacuum, used exclusively for vacuum loading, and marked “vacuum only” in place of HAWP as specified in Clause 7.2.10.6, not be less than 69 kPa (10 psi); and
(v) not applicable to vacuum hoses that are
  (1) an integral part of a boom assembly or vacuum system on tanks loaded by vacuum;
  (2) used exclusively for vacuum loading; and
(vi) 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.

12.8.6 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.

12.8.7 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.

12.9 Internal inspection by wet fluorescent magnetic particle inspection NA

12.9 References

NEE-FRM-007	Test and Inspection Report	(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 7.2 of CSA B620	Additional periodic inspection and test intervals	(See 21.1)
Table 7.3 of CSA B620	Pressures for periodic retesting	(See 21.1)
Table 7.4 of CSA B620	Minimum thickness for TC and MC 306, 307, and 312 specification tanks manufactured with steel and steel alloys.	(See 21.1)
Table 7.5 of CSA B620	Minimum thickness for TC and MC306,307, and 312 specification tanks manufactured with aluminum and aluminum alloys.	(See 21.1)
Required information on the Identification Plate checklist		(See 21.1)

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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: 02/19 VK 1239

where: 02/19 indicates Inspection and Test performed February 2019; VK indicates External Visual and Leakage Tests were successfully completed; 1239 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 systems 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 function(s). 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 systems 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, etc.)
- Repair or rework when the non-conformity requires repair work (eg. severe corrosion between dis-similar materials, distortion in the tank shell or abrasions, etc.), the procedures for repair will be discussed with the Process Owner. No repairs or rework shall be performed on non-metallic tanks.
- Repairs of the tank liquid retention components by welding/ brazing where defects are found that require welding/ brazing it will be written on a Welding Inspection Report, which include details of area welded, welding/ brazing procedure and welder/ brazer identification.
- All repairs shall be performed in compliance with the specification of the original design of the tank, in a facility registered with Transport Canada to perform that scope of work.
- All repairs shall be such that there will be no increase in the probability of cracking due to areas of increased stress due to shrinkage of cooling weldments.
- All welding/ brazing of lading retention components shall only be performed on tanks with design pressures less than 103 kpa (15 psig). Upon completion a welding/ brazing inspection shall be completed.

- Any non-conformance that becomes recurring shall be brought to the attention of the Process Owner who shall bring it to the attention of a Registered Design Engineer where appropriate.

- 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 requirements for the new construction of a tank of the same specification or by pressure testing of repaired lading retention components.

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

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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 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.

Material thickness shall be gauged using a micrometer, or ultrasonic thickness tester. The micrometer shall be calibrated prior to each use against a coupon or step block of known thickness. The ultrasonic thickness tester shall be calibrated against a step block of known thickness and compared against the micrometer. The step block shall be verified every 5 years or at any indication of damage or wear by a qualified inspection service.

When equipment requiring calibration is found to be out of calibration it shall be removed from the work area, repaired, 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 with accuracy class of 1.6. limits of permissible error of this class is ±1.6% of gauge's full scale.

If necessary, adjust the gauge and repeat the above paragraph until the values are same in accuracy class 1.6.

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 systems 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).

Certificates, forms and related documents which are listed in 'Mandatory document list' (see section 17.2).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 repair or re-work is required, the effectiveness of the repair or 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 systems manager shall annually review the complete process to ensure it is in conformance with this Quality Control Manual in the management review meeting. This Management Review Meetings shall include, but is not limited to:

- Results of audits
- Facility Registration documents
- Inspector/Tester/Welder (or brazer) qualifications
- Material procurement and control
- Quality Control process performance
- Identification plate stamping and tank marking
- 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 functions performed at the facility with the registration number of 25-1239, located at 46A Haniak Road, Rosslyn Ontario P7K 0C8.

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 Design Engineer is registered with TDG list of registered authorized personnel. See the registered personnel in the end of this section. All personnel are qualified by NEEI after a proper training and get the certificate of qualification (see section 18.3) 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 employment. The minimum qualification requirements of CSA B620 Clause 8 as follows:

Design Engineers

Every Design Engineer shall

(a) be an engineer and shall hold a current license by the appropriate authorities of his or her residence in Canada or the United States to practise engineering; and

(b) have at least one year of experience in the design of highway tanks in accordance with CSA B620 or 49 CFR.

National Energy Equipment Inc. may use (but are not limited to) the following firms (See the registered personnel in the end of this section) when engineering duties are required.

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.

Welders/ brazers

Every welder/ brazer shall:

• Qualified by this Facility authority in accordance with B620

Hose Testers and Inspectors

Every hose testers and inspector shall:

• Have training in product and hose safety, inspection and test procedures, and rejection criteria.

18.3 References

- List of registered design engineers (See 21.1)
- List of B620 personnel and their qualifications (See 21.1)
- Certificate of qualification (See 21.1)

SECTION - 19 Mobile Units

19.1 General

The process owner shall control service vehicles and related equipment at the registered facility 25-1239, located at 46A Haniak Road, Rosslyn Ontario P7K 0C8**.**

One service vehicle is available for mobile service.

All records of mobile Inspections and Testing shall be maintained at the registered facility (25-1239) where the mobile equipment is located.

19.2 Mobile Equipment

The tank inspector shall gather the following required equipment and documents from the shop and transfer them to the service vehicle. He should make sure that all of the following equipment are available on the service vehicle for mobile service:

- Controlled copy of this Quality Control Manual and CSA-B620 standard currently in place,
- Laptop, used to record inspection
- Inspection check list
- Camera
- Explosion-proof Flash Light
- Hose Inspection tags
- Tanks Inspection stickers
- TANK UNDER PRESSURE Sign x 2
- Zip Ties
- Regulator
- Test fittings and Adaptors
- Air Compressor
  - Gas Powered
  - Electric
  - Customer supplied
- Air Lines
- Soapy Water
- Wire Brush
- 10 Fill Betts Test Lid
- Hose Tester
  - Aviation
  - Gasoline/Diesel
- Calibrated Gauges

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) Copy of the certificate by the manufacturer, assembler or modifier
3) Calculations, drawings plus all superseded ones by the modifier
4) Inspection and test reports by the inspector or tester facility
5) Pressure test reports,
6) Hose test reports,
7) Calibration records,
8) Certificates of compliance from NEEI as well as those from other manufacturers
9) Repair reports

The national quality systems 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.

For tanks that have been manufactured, assembled, or repaired by NEEI, non-fading copies of the entire Job File, including the Certificate of Compliance, will be kept for a period of 20 years upon delivery of a manufactured or assembled tank to a tank Owner or purchaser, NEEI will issue a Certificate of Compliance for New & Assembled Tanks (Form No. NEE-FRM-004).

For tanks that have been modified by NEEI, non-fading copies of the entire Job File, including the Certificate of Compliance, will be kept for a period of 20 years. Upon delivery of a modified tank to a tank Owner or purchaser, NEEI will issue a Modification Certificate of Compliance (Form No. NEE-FRM-005).

These Certificates of Compliance shall be retained by the Owner throughout the ownership of the tank and for at least one year thereafter.

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-004 Certificate of compliance for new & assembled tanks (See 21.1)
- NEE-FRM-005 Modification certificate of compliance (See 21.1)
- NEE-FRM-007 Test and inspection report (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 NA

NATIONAL ENERGY EQUIPMENT INC.	Metal identification plate stamping
Form Number:NEE-FR-L-001	Revision: 0

NOTE* - All characters are to be a minimum 5mm (3/16") high and be stamped or embossed.

Tank Manufacturer: _____ Date of Manufacture: _____

Specification TC: _____ MDIN: _____

Assembler: _____ Date of Assembly: _____

TCRN: _____ Serial No.: _____

VIN: _____ Certification Date: _____

Org. Test Date: _____

Design Temp. Range: _____ to _____ °C Max. Lading Density: _____ kg/L

MAWP: _____ kPa Test Pressure: _____ kPa

Lining Material: _____ Shell Material: _____

Head Material: _____ Weld Material: _____

Min. Shell Thickness: Top _____ Sides _____ Bottom _____

Min. Head Thickness: Top _____ Sides _____ Bottom _____

Compartment:	1	2	3	4	5
Volume Cap (L)					
Exposed Surface Area (sq. meters)					

Max. Payload: _____ kg Max. Load Rate: _____ L/min@ _____ kPa

Max. Unload Rate: _____ L/min@ _____ kPa

Mfd. Shell Thickness: _____ mm Mfd. Head Thickness: _____ mm

Heating System Pressure: _____ kPa Heating System Temperature: _____ °C

21.1.2 NA

NATIONAL ENERGY EQUIPMENT INC.	Modification Plate Stamping
Form Number:NEE-FRM-002	Revision: 1

Note*- All characters to be a minimum 5mm (3/16") high.

Indicate ALL items modified from original Specification

MODIFIED BY

NATIONAL ENERGY EQUIPMENT INC.

25 - _____

Manufacturer _____ Serial No. _____

Modification Date _____ Re-certification Date _____

Re-test Date _____

Items Modified _____

_____

TCRN (if applicable) _____ Remount —Design change ☐

MDIN (if applicable) _____ Remount —No Design change ☐

Plate as per CSA B620, Clause 7.6.9

21.1.3 NA

NATIONAL ENERGY EQUIPMENT INC.	Specification plate information sheet for recertified tanks
Form Number:NEE-FRM-003	Revision: 0

Owner: _____ Unit #: _____

Record all required information from the Specification Plate below. If the Spec Plate is illegible, a rubbing may be made and the information may be used for the test and inspection purposes.

Required Information:

TC Specification		Vessel Material Spec # Shell	
Tank Manufacturer		Manufactured Shell Thickness	
Tank Vehicle Serial Number		Vessel Material Spec # Head	
Tank Vehicle Assembler		Manufactured Head Thickness	
Completion/Manufacture Date		Weld Material	
Certificate Date		Volumetric Capacity (Litres)	
Original Test Date		Max Pay/Product Load (kilograms)/(lbs)	
Tank Test Pressure (kpa)		Max Loading Limit/Rate (lpm@kpa)	
MAWP/Design Pressure		Max Unloading Limit/Rate (lpm@kpa)	
Lining Material (when applicable)			

Manufacturer Design ID #		Max Lading Density	
Tank Design Temp Range (degrees C)		Min Allowable Shell Thickness	
Min Allowable Head Thickness		Exposed Surface Shell Thickness	
Heating System Design (kpa)		Heating System Design Temp (C)	

TCRN/CRN Number		Mark OT or NOT at/near ID Plate	
Single Plate _____	Duplicate Plate _____		

Technician (print): _____ Signature: _____

21.1.4 NA

NATIONAL ENERGY EQUIPMENT INC.	Certificate of Compliance for New or Assembled Tanks
Form Number:NEE-FRM-004	Revision: 1

(page 1 of 2)

Registration No. 25-_____

Highway Tank Serial No. _____ Specification TC _____

VIN No. _____ TCRN _____

Tank Manufacturer _____ MDIN _____

Manufacturer Address _____

Tank Assembler _____ Assembler Address _____

We certify that the tank, fittings, valves, piping and protective devices comply with the applicable specifications of CSA B620 to the extent of the work performed.

Full Spec _____ **Short Spec** _____ **TCRN** _____ **MDIN** _____

Date of Manufacture: Month: _____ Year: _____ **Certification Date:** Month: _____ Year: _____

Original Test Date: Month: _____ Year: _____

MAWP: _____ kPa **Test P:** _____ kPa **Design Temperature Range:** _____ to _____ degrees C

Tank Material: Shell: _____ Heads: _____

Manufacturer Thickness: Shell: _____ Heads: _____

Minimum Thickness: Shell: _____ Heads: _____

Top: _____ Sides: _____ Bottom: _____

Weld Material: _____

Heating System Pressure: _____ kPa **Heating System Temperature:** _____ °C

Compartment Number	1	2	3	4	5	6	**Total**
Volumetric Cap. (Liters)							
Exposed Surface							

Pressure Relief Device Set Pressure: _____ Rating: _____ Scfh at _____

Quantity: Per compt _____

Max. Lading: Density _____ Kg/L Max. Payload: _____

Max. Load Rate: _____ L/min at _____ kPa Max. Unload Rate: _____ L/min at _____ kPa

Lining Material: _____

This Certification Includes:

- Tank - Chassis ☐
- Assembly ☐
- Piping & Valves ☐
- Bumper ☐
- Damage Protection ☐
- Valve Operating Devices ☐
- Relief Devices ☐

NATIONAL ENERGY EQUIPMENT INC.

Certificate of Compliance for New or Assembled Tanks

Form Number:NEE-FRM-004 | Revision: 1

(page 2 of 2)

This Certification Excludes:

- Tank - Chassis ☐
- Assembly ☐
- Piping & Valves ☐
- Bumper ☐
- Damage Protection ☐
- Valve Operating Devices ☐
- Relief Devices ☐

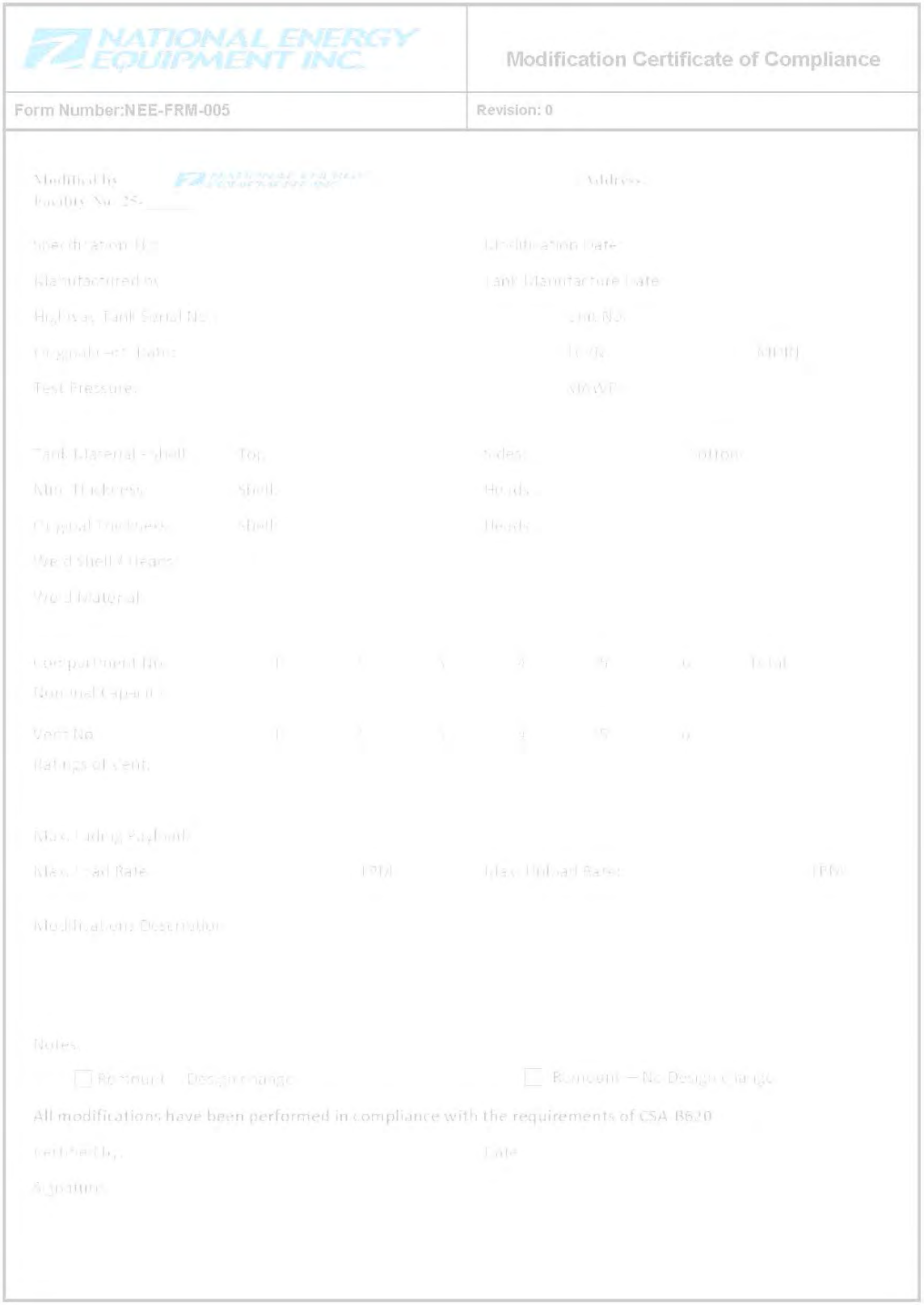
Tank Tester (Print): _____ Signature: _____

Date: _____

Certified By (Print): _____ Signature: _____

Date: _____

21.1.5 NA



NATIONAL ENERGY EQUIPMENT INC.

Modification Certificate of Compliance

Form Number:NEE-FRM-005 | Revision: 0

Modified by: NATIONAL ENERGY EQUIPMENT INC. | Address:

Facility No. 25-

Specification: | Certification Date:

Manufactured by: | Tank Manufacture Date:

Highway Tank Serial No.: | CRN #:

Original Test Date: | MAWP: | MAWP:

Test Pressure:

Tank Material - shell: | Top: | Sides: | Bottom:

Min. Thickness: | Shell: | Heads:

Original Thickness: | Shell: | Heads:

Weld Shell / Heads:

Weld Material:

Compartment No.: | 1 | 2 | 3 | 4 | 5 | 6 | Total

Nominal Capacity:

Vent No. | 1 | 2 | 3 | 4 | 5 | 6

Ratings of Vent:

Max. Filling Height:

Max. Load Rate: | IPM | Max. Unload Rate: | IPM

Modification Description:

Notes:

☐ Re-stamp – Design change ☐ Re-stamp – No Design change

All modifications have been performed in compliance with the requirements of CSA B620

Certified By: | Date:

Signature:

21.1.6 NA

NATIONAL ENERGY EQUIPMENT INC.	Repair report
Form Number:NEE-FRM-006	Revision: 0

Registration #: 25-_____

Facility Address: _____

Owner's Name: _____ Owner's Tel. No.: _____

Owner's Address: _____

Manufacture: _____ Serial #: _____

MFR Date: _____ Material: _____ Tank Spec: _____

Date of Repair: _____

Description of Repair (Provide sketch if required)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Weld Procedures used: _____

Authorized Welder Name: _____ Signature: _____

Date: _____

21.1.7

NATIONAL ENERGY EQUIPMENT INC.			Test and Inspection Report
Form Number:NEE-FRM-007		Revision: 4	(Page 1of 4)
Facility Name:	National Energy Equipment Inc.	Test Date:	
Address:			
Telephone		Facility Registration No.:	
Tank Owner			
Address:			
Telephone		Work Order Location:	
OWNERS UNIT No.:		SERIAL No.:	
MANUFACTURER:		MAWP:	
CERT. DATE:	MATERIAL:		TANK SPEC:

For TC/MC331 & TC51 Stress relievedafter repair:	QT Complete	NQT Local	PWHT N/A
COMP. CAPACITY (IG/L):	1 2 3 4 5 6		
TESTS PERFORMED	"V"	"K"	"I"
	"P"	"T"	"UC"

EXTERNAL VISUAL INSPECTION "V"	QC Man. Reference:	12.2
Data plate and other markings, present and legible	Complies	Retest complies
Shell & heads corrosion. abrasion, dents, overlay patches, leaks, loose bolts and nuts on any flanged/blank connection,defect welds, etc.	Complies	Retest complies
Structural members, outriggers, cross members etc.	Complies	Retest complies
Piping and valves for leakage, damage, corrosion	Complies	Retest complies
Remote closures, thermal devices	Complies	Retest complies
Hoses for defects, identification and test dates	Complies	Retest complies
Tank attachments to frame or running gear, elements of the UC assembly that can be inspected without dismantling	Complies	Retest complies
Ladders, walkways, etc.	Complies	Retest complies
Fill covers, manways and closure devices	Complies	Retest complies
Relief valves and vents (replace or test if tank in service where lading corrosive to relief device)	Complies	Retest complies
Accident damage protection	Complies	Retest complies
Engine air intake shut off device and dry chemical fire extinguishers (Transport Canada's requirement)	Complies	(It is not a rejection)

Note: Rejection Criteria for 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 or any source of leakage
Any repairs made using overlay patches
Defective, unidentified or out of test Hose Assemblies

Inspector Name:	Signature:	After Retest Signature:
Tank Tester Name (If applicable):	Date:	Date:

NATIONAL ENERGY EQUIPMENT INC.	Test and Inspection Report	
Form Number:NEE-FRM-007	**Revision: 4**	**(Page 2of 4)**
Facility Name: **National Energy Equipment Inc.**	Test Date:	
Address:		
Telephone	Facility Registration No.:	
Tank Owner		
Address:		
Telephone	Work Order Location:	
OWNERS UNIT No.:	SERIAL No.:	
MANUFACTURER:	MAWP:	
CERT. DATE: MATERIAL:		TANK SPEC:
INTERNAL VISUAL INSPECTION "I"	QC Man. Reference:	12.3
Interior surface, corrosion, distortion overlay patches, cracking etc.	Complies	Retest complies
Interior welds for defects, cracking etc.	Complies	Retest complies
Internal supports and attachments	Complies	Retest complies
Internal valves, piping and vents for leakage, damage, etc.	Complies	Retest complies

Note: Rejection Criteria for Visual Inspections
Less than minimum material thickness under any cut, dig or gouge
Any dent with a depth greater than ⅛" 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

Inspector Name:	Signature:	After Retest Signature:	
Tank Tester Name (If applicable):	Date:		Date:
UPPER COUPLER AREA INSPECTION "UC"	QC Man. Reference:		12.4
Upper coupler removed from tank and inspected incl. tank areas above	Complies	Retest complies	
Turn table assembly inspected in place	Complies	Retest complies	
Inspected elements:			
Inspector Name:	Signature:	After Retest Signature:	
Tank Tester Name (If applicable):	Date:		Date:
LEAKAGE TEST "K"	QC Man. Reference:		12.5
TEST PRESSURE (80% of MAWP MIN):	TEST MEDIUM:		
Compartment No. 1 Leakage Tested	Passes	Retest complies	
Compartment No. 2 Leakage Tested	Passes	Retest complies	
Compartment No. 3 Leakage Tested	Passes	Retest complies	
Compartment No. 4 Leakage Tested	Passes	Retest complies	
Compartment No. 5 Leakage Tested	Passes	Retest complies	
Compartment No. 6 Leakage Tested	Passes	Retest complies	
Compartment No. 1 Piping Leakage Tested	Passes	Retest complies	
Compartment No. 2 Piping Leakage Tested	Passes	Retest complies	
Compartment No. 3 Piping Leakage Tested	Passes	Retest complies	
Compartment No. 4 Piping Leakage Tested	Passes	Retest complies	
Compartment No. 5 Piping Leakage Tested	Passes	Retest complies	
Compartment No. 6 Piping Leakage Tested	Passes	Retest complies	
Tester Name:	Signature:	After Retest Signature:	
	Date:		Date:

NATIONAL ENERGY EQUIPMENT INC.

Test and Inspection Report

Form Number:NEE-FRM-007 | **Revision: 4** | **(Page 3of 4)**

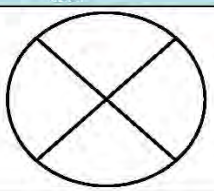
Facility Name:	**National Energy Equipment Inc.**	Test Date:	
Address:			
Telephone		Facility Registration No.:	
Tank Owner			
Address:			
Telephone		Work Order Location:	
OWNERS UNIT No.:		SERIAL No.:	
MANUFACTURER:		MAWP:	
CERT. DATE:	MATERIAL:		TANK SPEC:

THICKNESS TEST "T" | QC Man. Reference: 12.6

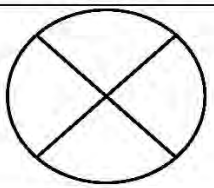
Thickness tester calibrated?

Front of the tank	12:00	3:00	6:00	9:00
Shell's position number 1				
Shell's position number 2				
Shell's position number 3				
Shell's position number 4				
Shell's position number 5				
Shell's position number 6				
Shell's position number 7				
Shell's position number 8				
Shell's position number 9				
Shell's position number 10				
Shell's position number 11				
Shell's position number 12				
Shell's position number 13				
Shell's position number 14				
Shell's position number 15				
Shell's position number 16				
Shell's position number 17				
Shell's position number 18				
Shell's position number 19				
Shell's position number 20				
Shell's position number 21				
Shell's position number 22				
Shell's position number 23				
Shell's position number 24				
Shell's position number 25				
Shell's position number 26				
Shell's position number 27				
Shell's position number 28				
Shell's position number 29				
Shell's position number 30				
Rear of the tank	12:00	3:00	6:00	9:00

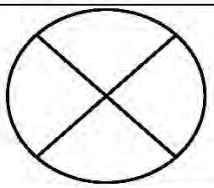
Front Head



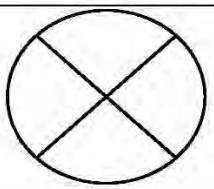
Rear Head



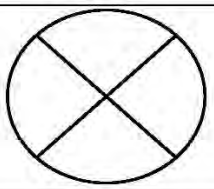
Manway



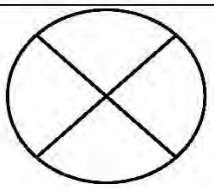
Sump



Nozzle 1



Nozzle 2



Complies | Redo complies

Tester Name: | Signature: | Date: | After Retest Signature: | Date:

NATIONAL ENERGY EQUIPMENT INC.

Test and Inspection Report

Form Number:NEE-FRM-007 | **Revision: 4** | **(Page 4of 4)**

Facility Name:	**National Energy Equipment Inc.**	Test Date:	
Address:			
Telephone		Facility Registration No.:	
Tank Owner			
Address:			
Telephone		Work Order Location:	
OWNERS UNIT No.:		SERIAL No.:	
MANUFACTURER:		MAWP:	
CERT. DATE:	MATERIAL:		TANK SPEC:

PRESSURE TEST "P" — QC Man. Reference: 12.7

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

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

Compartment No. 1 Leakage Tested	Passes	Retest complies
Compartment No. 2 Leakage Tested	Passes	Retest complies
Compartment No. 3 Leakage Tested	Passes	Retest complies
Compartment No. 4 Leakage Tested	Passes	Retest complies
Compartment No. 5 Leakage Tested	Passes	Retest complies
Compartment No. 6 Leakage Tested	Passes	Retest complies
Compartment No. 1 Piping Leakage Tested	Passes	Retest complies
Compartment No. 2 Piping Leakage Tested	Passes	Retest complies
Compartment No. 3 Piping Leakage Tested	Passes	Retest complies
Compartment No. 4 Piping Leakage Tested	Passes	Retest complies
Compartment No. 5 Piping Leakage Tested	Passes	Retest complies
Compartment No. 6 Piping Leakage Tested	Passes	Retest complies

Tester Name: Signature: After Retest Signature:

Date: Date:

CONCLUSION

Any defect or damage discovered on tank? Yes or No

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

Tank successfully retested after repair		Yes or No	Not Applicable
Written repair weld inspection report attached		Yes or No	Not Applicable
Expired Inspection Markings removed		Yes or No	
TANK DISPOSITION	Removed from Service		Yes or No
	Safety Mark (Specification Indication) removed		Yes or No
	Returned to Service		Yes or No
PWHTafter repair of a TC/MC331 & TC51		Yes or No	Not Applicable
Wet Florescent Markings applied and report attached		Yes or No	Not Applicable
Inspection Markings applied		Yes or No	
FAILED INSPECTION		PASSED INSPECTION	

Inspector Name: Signature: After Retest Signature:

Date: Date:

21.1.8 NA

NATIONAL ENERGY EQUIPMENT INC.	Metal identification plate replacement
Form Number:NEE-FRM-008	Revision: 0

☐ Obtained tank's original or replacement Certificate of Compliance

☐ The present condition of the tank meets the specification to which it was originally certified and is indeed the tank listed in the above supporting documentation.

Tank Specification: _____

Notes:

- Replacement metal ID plate shall be permanently affixed to the tank or its supporting structure by brazing or welding around its perimeter or by means of tamper-resistant fasteners.
- NEEI's current scope does not include manufacture, assembly, modify, or repair functions for the following tanks: TC407/TC307, TC412/TC312, TC338, and TC341. Therefore, we cannot stamp or install a replacement metal ID plate for these type of tanks.
- For TC331 tank specifications, the replacement of a metal ID plate must be done in accordance with the requirements of the Manitoba pressure vessel authority.
- NEEI Winnipeg's Certificate of Registration for TC331 tanks is limited to Assembly, a plate shall not be installed if the installation involves welding to the tank wall. The replacement metal ID plate could be installed by means of tamper-resistant fasteners as per page 33, item 17 of QC manual, pertaining to TC331tanks.

Original Tank Manufacturer: _____ Original Date of Manufacture: _____

Original Tank Vehicle Assembler: _____ Date of Assembly: _____

Tank Serial No.: _____ Vehicle Identification Number: _____

Owner's Name: _____

Owner's address: _____

Owner's Signature: _____

Registered Facility Installing Replacement Plate Name: _____

Installing Plate Facility Number: _____

Registered Facility address: _____

Name of Compliance Officer at Registered Facility: _____

Signature of Compliance Officer at Registered Facility: _____

Date of Installment of the Plate: _____

☐ Attach a copy of the supporting documentation (tank's original or replacement Certificate of Compliance)

☐ Attach a full copy of a facsimile or rubbing of the replacement plate. (Full image of the plate)

Note: This form and a copy of the information on the replacement metal ID plate shall be kept by the owner or his/her designate throughout the ownership of the tank, and a copy shall be retained for at least 1 year, thereafter. Copies shall also be retained by the facility installing the plate for a minimum of 20 years from the date of delivery.

21.1.9 NA

QW-482 suggested format for welding procedure specifications (WPS)
(see QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name	National Energy Equipment Inc.		
Welding Procedure Specification No.:	GMAW-AL-01	Revision:	0
Supporting PQR No (s):	GMAW-AL-01	Issue Date:	4-Feb-19
Welding Process(es):	GMAW	WO:	W13939-D2
Type(s):	Semi-Automatic		

JOINTS (QW-402)

[illegible]	Refer Details	[illegible]	1/32 in - 1/8 in
[illegible]	With or Without	[illegible]	No Retainers
[illegible]	P no. 22		

Details:
All ASME VIII Div 1 & B31.3 Standard
Groove Weld Joint Design & Fillets

All CJP welded from both sides with back gouge to sound metal or welded from one side with backing.

* For welds with backing use Root Spacing = 1/8 in - 3/16 in.
Sketches, production drawings, weld symbols or written description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

BASE METALS (QW-403)

[illegible]	22	[illegible]	N/A	[illegible]	22	[illegible]	N/A

Thickness Range:

[illegible]	1/16 in (1.5 mm) to 0.5 in (12.7 mm)	[illegible]	All thicknesses
[illegible]	All	[illegible]	All
[illegible]	N/A		
[illegible]	None		
[illegible]	N/A		

FILLER METALS (QW-404)

[illegible]	GMAW
[illegible]	F22
[illegible]	ER5356
[illegible]	5.10
[illegible]	ER5356
[illegible]	0.035 in (0.9 mm)
[illegible]	None
[illegible]	Solid wire
[illegible]	
[illegible]	0.5 in (12.7 mm) max.
[illegible]	All sizes
[illegible]	None
[illegible]	None
[illegible]	N/A

QW-482 (BACK)

WPS no. GMAW-AL-01 Rev. 0

POSITIONS (QW-405)	
	All
	Up
	All

POSTWELD HEAT TREATMENT (QW-407)		
	None	
	N/A	N/A
	N/A	

PREHEAT (QW-406)	
	65°F (18°C)
	180°F (82°C)
	As Above
	N/A

GAS (QW-408)			
	GMAW		
		Argon	100% Argon 20-30
		None	
		None	

ELECTRICAL CHARACTERISTICS (QW-409)			
	As per welding parameters		
	DC		RP (EP)
	See below		See below
	Global, Spray or Pulsed		
	N/A		

TECHNIQUE (QW-410)	
	GMAW
	Stringer / slight weave
	9/16 in (14 mm)
	Brushing, grinding
	Grinding, Plasma Arc or Mechanical Gouging
	None
	Single / Multipass, as required
	Single
	0.75 in - 1 in (19 mm - 25 mm)
	N/A
	Semi-Automatic
	None
	None

Root / Hot	GMAW	ER5356	0.035 in	DC RP (EP)	180-240	21-25	473-577	10-20
Fill & Cap	GMAW	ER5356	0.035 in	DC RP (EP)	180-240	21-25	473-577	10-20

Welding Notes:

Base metal shall be clean, dry & without water stain. Prepare weld joints by mechanical means (cutting, sawing, shearing etc), plasma arc cutting, laser cutting or water jet cutting. It is recommended to use acetone as a cleaning agent prior to welding (before removal of the oxide layer) and between passes. Immediately prior to welding remove oxide using either a stainless steel brush or a non-resin bonded grinding disk (resin bonded disks may be used for post weld operations only). Remove smut between passes with a stainless steel wire brush. Ideally aluminum welding operations will be kept separate from welding on other materials. Do not use equipment for the welding of Aluminum that has been previously used for the welding or cleaning of other materials.

Manufacturer: National Energy Equipment Inc.

Zanyar Farhadi, National Quality Systems Manager

2019-02-13

2019-02-08

Mathew Smith, P. Eng.

QW-483 suggested format for procedure qualification records (PQR)
(see QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupons

Company Name	National Energy Equipment Inc.	By:	
Procedure Qualification Record (PQR) No.:	GMAW-AL-01	Revision:	0
Welding Procedure Specification (WPS) No.:	GMAW-AL-01	Issue Date:	4-Feb-2019
Welding Process(es):	GMAW	WO:	W13939-D2
Type(s) (Manual, Automatic, Semi-automatic):	Semi-automatic		

JOINTS (QW-402)

Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

BASE METALS (QW-403)

Material Spec.	ASTM B209	ASTM B209
Type or Grade	5052	5052
P-No.	P22	P22
Group No.	N/A	N/A
Thickness of test coupon	0.25 in (6.4 mm)	
T Qualified	N/A	
T-T min/max	N/A	
Pass > 1/2 in (13 mm)	None	
T Limits (S. cir. arc)	N/A	

POST WELD HEAT TREATMENT (QW-407)

PWHT	None		
Temperature	N/A	Time	N/A

GAS (QW-408)

	Gas(es)	Percent Composition (Mixture)	Flow Rate (l/min)
Shielding Gas (GTAW)	Argon	100% Ar	25
Backing Gas	N/A	N/A	N/A
Trailing Gas	N/A	N/A	N/A

FILLER METALS (QW-404)

	All Passes
SFA Specification	5.10
Filler Metal Classification	ER5356
Filler Metal F-No.	F22
Weld Metal Analysis A-No.	ER5356
Size of Filler Metal	0.035 in (0.9 mm)
Filler Metal Product Form	Solid Wire
Consumable insert	None
Weld Metal Thickness (t)	0.25 in (6.4 mm)
Supplemental Filler Metal	None
Alloy Element	None
t Limits (S. cir. arc)	N/A
Other/Brand name	Linde ER5356

ELECTRICAL CARACTERISTICS (QW-409)

	All Passes
Heat Input (kJ/in), Max	21.8
Current	DC
Polarity	RP (EP)
Amperes	210
Volts	23
Mode of Transfer	Spray
Tungsten electrode	N/A
Wire Feed Speed (ipm)	525
Other: ATS (ipm)	13.3-17.1

POSITION (QW-405)

Welding Process	GMAW
Position of Groove	1G (Flat)
Weld Progression	N/A
Other	

Technique (QW-410)

String or Weave Bead	Stringer
Orifice, cup, or Nozzle Size	9/16 in (14 mm)
Cleaning Method	Grinding, brushing
Back Gouge Method	Grinding
Oscillation	None
Multipass or Single Pass/side	Single
Single or Multiple electrodes	Single
Contact Tube to Work Distance	1 in (25 mm)
Electrode spacing	N/A
Manual or automatic	Semi-automatic
Peening	None
Use of thermal processes	None

PREHEAT (QW-406)

Preheat Temperature	65°F (18°C)
Min. Interpass Temperature	65°F (18°C)
Max. Interpass Temperature	80°F (27°C)
Other	

QW-483 (BACK)

PQR No: GMAW-AL-01

TENSILE TEST (QW-150)

5T1	6.15	18.9	116	22.5	194	Base Metal - Ductile
5T2	6.15	18.9	116	22.8	196	Base Metal - Ductile
Comments:	Specified UTS: 170 Mpa min. SKC Report No. W13939-P1901301125T, dated 29/01/2019					

GUIDE BEND TEST (QW-160)

5F1	Transverse, Face	QW-462.3(a)	180°	Acceptable	Discontinuities within limit
5F2	Transverse, Face	QW-462.3(a)	180°	Acceptable	Discontinuities within limit
5R1	Transverse, Root	QW-462.3(a)	180°	Acceptable	Discontinuities within limit
5R2	Transverse, Root	QW-462.3(a)	180°	Acceptable	Discontinuities within limit
Comments:	SKC Report No. W13939-P1901301156B, dated 30/01/2019				

TOUGHNESS TEST (QW-170)

N/A						
Comments:						

Hardness Test

N/A										
Comments:										

WELDING EQUIPMENT AND SETTINGS DETAILS

Welding Process:	GMAW		
Current Type:	CV		
Transfer:	N/A		
Shielding Gas:	N/A		
Tungsten Size:	N/A		
Welded By:	Michael Critchlow	Welder ID:	BCSA Reg. # 384846
Test Witnessed By:	1G MC 13939	Witnessing Company:	18-Jan-2019
Welding Procedure Specification:	SKC Engineering Ltd.	Laboratory Test No:	W13939-P1901301125T & W13939-P1901301156B
Mechanical Tests Conducted By:	Christopher Ross, Applus RTD		

Notes:

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of ASME IX.

Name of Company: National Energy Equipment Inc.

Zanyar Farhadi, National Quality Systems Manager

Approval

Date: 2019-02-13

2019-02-06

Witness: Mathew Smith, P. Eng.

SKC ENGINEERING

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21.1.10 NA

NATIONAL ENERGY EQUIPMENT INC.	TC 331 tank 1-year inspection checklist
Form Number:NEE-FR-L-010	Revision: 0

Page 1 of 2

Date: _____ Inspected by: _____
Tank Owner: _____ Phone #: _____
Address: _____ Unit #: _____
_____ Tank Manufacturer: _____
Serial #: _____ Tank Spec: _____ MFG Date: _____
Shell Material: _____ Comp. Sizes: _____
Original Test Date: _____ M.A.W.P.: _____ Test Pressure: _____
Tests Performed: V K Hose Test Next 5-year inspection: _____

Tank and attachments must be clean prior to inspection

Working from Heights policies are in effect

External Visual "V"

-Inspect data plate [12.2] (legible, permanently affixed, has all information required in 12.2)
Pass___ Fail___ N/A___

-Inspect tank inspection decals [12.2] (verify what tests are required, 1 year or 5 year)
Pass___ Fail___ N/A___

-Inspect tank bulk heads and shell [12.2] (Check for corrosion, dents, distortions, defects in welds, leakage, damage indicating weakness in the tank that could render it unsafe for transport, voids on bottom of tank are not capped and show no signs of leakage.)
Pass___ Fail___ N/A___

-Inspect fenders and attachments [12.2] (Ladder/drop hose compartments latch, cracks, damage to fenders or mounting)
Pass___ Fail___ N/A___

-Inspect bumper / rear end protection [12.2] (Securely mounted, welds, damage, correct dimensions, distance between widest part of rear of vehicle and outward edge of bumper does not exceed 18" distance between bottom of bumper and ground is less than 30" when empty,)
Pass___ Fail___ N/A___

-Inspect rear tank sills/frame [12.2] (damage, welds)
Pass___ Fail___ N/A___

-Inspect placards (correct product, legible, all 4 present)
Pass___ Fail___ N/A___

-Inspect tank mounts [12.2] (unable to loosen with wrench, welds on brackets, condition of sill fil material [wood/rubber etc.])
Pass___ Fail___ N/A___

-Inspect underslung boxes [12.2] (hydraulic leaks, fitting/flange leaks, gaskets, pump/meters securely mounted, all valves/air switches work correctly, grasshopper springs)
Pass___ Fail___ N/A___
-Inspect slam latches/door safety latches [12.2] (all latch correctly)
Pass___ Fail___ N/A___
-Inspect cabinet doors (damage, seal properly when closed)
Pass___ Fail___ N/A___
-Inspect all air switches (make sure all switches work)
Pass___ Fail___ N/A___
-Inspect emergency switches (verify operation of all)
Pass___ Fail___ N/A___

-Inspect underneath tank [12.2] (dents, corrosion, leaks,ISC vics, 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)
Pass___ Fail___ N/A___

-Inspect on top of tank [12.2] (dents, corrosion, fall protection functions (if equipped), anti-slip grating insecure or wearing tank, obvious signs of leakage,
Pass___ Fail___ N/A___

Leakage Test "K" Test Pressure _____

Dedicated service, the test pressure shall be the maximum normal operating pressure of the tank,

MC 330, MC 331 or TC 331 in LPG or NH3 service shall be tested at no less than 60 PSI.

- Pressure test compartment and all associated,

- Spray with soapy water all welds pipe connections, meter and pump equipment for signs and observe for signs of leaks.

TANK [12.5] Pass___ Fail___ N/A___ PIPING [12.5] Pass___ Fail___ N/A___

PUMP [12.5] Pass___ Fail___ N/A___ METER [12.5] Pass___ Fail___ N/A___

NATIONAL ENERGY EQUIPMENT INC.	TC 331 tank 1-year inspection checklist
Form Number:NEE-FR-L-010	Revision: 0

Emergency Discharge Control [12.2] Pass___ Fail___ N/A___ Page 2 of 2

-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.

-The system will be tested at the time of inspection.

-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) and

-When the Emergency shutdown has been activated, the ISC can't be reactivated remotely.

-Indicate results on *Test and Inspection Report* (Form No: NEE-FR-L-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.

Hose Test [12.2 & 12.9]

-Perform visual inspection of all hoses (look for kinks, exposed re-enforcement, damaged ends, gaskets)
Pass___ Fail___ N/A___

-Pressure test all hoses (hold pressure for 5 minutes) Pass___ Fail___ N/A___

Hose I.D. : _____ _____ _____ _____ _____
Test Press. : _____ _____ _____ _____ _____
(Test/MAWP)
Test Medium : _____

Fail Items	Failure Corrected
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____
_____	Y____ N____

ONLY AFTER SUCCUSSFEUL TEST WILL MARKINGS BE APPLIED

Has inspection sticker been applied to tank? Y____ N____
(Sticker must be affixed Driver-side front of the barrel and clearly visible)
Has B620 test and inspection report been filled out? Y____ N____

**** Take picture of Data Plate and attach to NEEI copy of Inspection Report***

21.1.11 NA

NATIONAL ENERGY EQUIPMENT INC.	Test and inspection travel sheet
Form Number:NEE-FRM-011	Revision: 1

COMPANY:
ADDRESS:

DATE: UNIT No.:
TC SPEC.: DESIGN PRESSURE: MANUFACTURER:

YEAR OF MANUFACTURE: TANK SERIAL No.:
CAPACITY BY COMPARTMENT:

1	2	3	4	5	6

LAST SERVICE ON:

Certified by:

Inspection Conducted by:

No.	INSPECTION ACTIVITY	COMPLIES	REPAIR	HOLD POINT
1	Drawings			
2	Materials			
3	Welding			
4	External Visual Inspection			
5	Internal Visual Inspection			
6	Rollover Protection			
7	Emergency Flow Control & Piping			
8	Safety Relief Valves			
9	Vapour Tightness Test			
10	Lining Inspection			
11	Leakage Test			
12	Ultrasonic Thickness Test			
13	Wet Fluorescent Test			
14	Hose Assembly			
15	Hydrostatic Retest			
16	Cold Vacuum Retention Test			
17	Helium Detection Test			
18	Manhole Covers			
19	Manufacture / Repair / Recertification Plate			
20	Other (detail)			

Process Owner: Date:

The Inspector shall be presented with the Travel Sheet prior to construction so that he can designate additional inspection points and/or Hold Points. Any revisions shall be marked with a delta symbol with revision number and described at the bottom of this page.
Hold points will be denoted as: H=HOLD, I=INSPECTION, R=REVIEW, W=WITNESS

21.1.12

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:

21.1.13 NA

NATIONAL ENERGY EQUIPMENT INC.	Welding inspection report
Form Number:NEE-FR-L-013	Revision: 0

Facility Address:

Registration #:

Owner's Serial #: _____

Manufacture: _____ Serial #: _____

MFR Date: _____ Material: _____ Tank Spec: _____

Location of welds to be inspected (Provide sketch if required)

_____

_____

_____

_____

_____

Welding Process(es): _____ WPS: _____

Welder Qualification Verified YES _____ NO _____

ITEM	ACCEPT	REJECT
Porosity and/or Inclusions		
Complete Fusion		
Start and End Complete		
Full Penetration		
Welder Identification		

Inspector Name (print): _____ Signature _____

Date: _____

** This report must be attached to the Test and Inspection Report for this unit.*

21.1.14

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

1-15 PSI gauges are to be used.

21.1.15

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

21.1.16 NA

NATIONAL ENERGY EQUIPMENT INC.	Welder Continuity Log
Form Number:NEE-FR-L-016	Revision: 0

Welder: _____

Identification #: _____

Date	Customer	Process	Date Qualified	Repair description

The Welder must use a Process once every 6 months, if not the Welders Qualification has expired.

21.1.17

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?	

21.1.18 Mandatory Document List

- NEE-FRM-001 Metal identification plate stamping
  Related Sections: 7 Manufacture, 8 Assembly
- NEE-FRM-002 Modification plate stamping
  Related Section: 9 Modification
- NEE-FRM-003 Specification plate information sheet for recertified tanks
  Related Sections: 7 Manufacture, 8 Assembly, 9 Modification
- NEE-FRM-004 Certificate of compliance for new & assembled tanks
  Related Sections: 7 Manufacture, 8 Assembly
- NEE-FRM-005 Modification certificate of compliance
  Related Section: 9 Modification
- NEE-FRM-006 Repair report
  Related Section: 10 Repairs
- NEE-FRM-007 Test and Inspection Report
  Related Section:12 Inspection and testing – examination
- NEE-FRM-008 Metal identification plate replacement
  Related Section:12 Inspection and testing – examination
- NEE-FRM-010 TC331 Tank 1-year Inspection Check List
  Related Section:12 Inspection and testing - examination
- NEE-FRM-011 Test and inspection travel sheet
  Related Sections: 7 Manufacture, 8 Assembly, 9 Modification
- NEE-FRM-012 Hose Assembly Test and Inspection Report
  Related Section:12 Inspection and testing - examination
- NEE-FRM-013 Welding inspection report
  Related Sections:10 Repairs, 15 Welding / brazing control
- NEE-FRM-014 Gauge Calibration Log
  Related Section:16 Calibration
- NEE-FRM-015 Equipment Calibration Log
  Related Section:16 Calibration
- NEE-FRM-016 Welder Continuity Log
  Related Section: 15 Welding control
- NEE-FRM-017 Nonconformance corrective and preventative action report
  Related Section: 14 Nonconformities-Corrective action, 17 Quality audits

21.1.19 List of registered design engineers

Name:	Ahmad Moaaz
Address:	1004 600 Setter St Winnipeg MB R2Y 2H7
Registration No.:	35-0188
Date of Expiry:	01-February-2021
Telephone:	204-698-0657

Transport Canada Transports Canada

Certificate of Registration

This is to certify that

Ahmad Moaaz

residing at:

1004 600 Setter St
Winnipeg, MB
R2Y 2H7

is registered as a

Design Engineer

pursuant to the requirements of Clause 8.1.5 of CSA Standard B620-09.

EXPIRY DATE OF THIS REGISTRATION:
Unless otherwise notified this registration is valid until the date of expiry indicated below. A new application must be submitted where there is any substantive change in the information given on the application form filed with Transport Canada. Application for renewal must be made by email at least three months before expiry.

DATE OF ISSUE: 08-January-2016
DATE OF EXPIRY: 01-February-2021

REGISTRATION #: 35-0188

21.1.20 List of B620 personnel and their qualifications

Name:	
Position:	
Qualification Date:	
Qualification Process:	
Name:	
Position:	
Qualification Date:	
Qualification Process:	
Name:	
Position:	
Qualification Date:	
Qualification Process:	
Name:	
Position:	
Qualification Date:	
Qualification Process:	
Name:	
Position:	
Qualification Date:	
Qualification Process:	
Name:	
Position:	
Qualification Date:	
Qualification Process:	

21.1.21


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

21.1.22

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 Next 8 years: every 2 years After 12 years: annually	Initial: 4 years Next 8 years: every 2 years After 12 years: annually		Initial: 4 years Next 8 years: every 2 years 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.

Table 7.2 of CSA B620 Additional periodic inspection and test intervals

(See Clauses 7.1.1 and C.6.)

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 7.2.6 Thickness test[6]	Clause 7.2.4 Upper coupler inspection
All tanks designed to be loaded by vacuum, with full opening rear heads	6 months[5]	—	—	—	2 years	—	—
All lined tank trucks and tank trailers in corrosive service	—	1 year	1 year	—	—	—	—
All lined tank trucks and tank trailers not in corrosive service[7]	—	—	5 years	—	—	—	—
All unlined tank trucks and tank trailers in corrosive service[2]	—	1 year	—	—	—	2 years[4]	—
All insulated tank trucks and tank trailers[3]	—	1 year	—	—	—	—	—
All insulated highway and portable tanks, lined or without manholes[2]	—	—	—	—	1 year	—	—

Table 7.2 (Concluded)

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 7.2.6 Thickness test(6)	Clause 7.2.4 Upper coupler inspection
All tank trailers Not in corrosive service equipped with an upper coupler	—	—	—	—	—	—	5 years
All tank trailers in corrosive service equipped with an upper coupler							2 years

Notes:

(1) *Where the tank is not equipped with a manhole or inspection ports, a hydrostatic or pneumatic test shall be performed at the interval for internal inspections.*

(2) *Except TC 338 and 341 tanks.*

(3) *Except TC 331, 338, and 341 tanks.*

(4) *If the thickness is such that less than 20% of the corrosion allowance remains, a thickness test shall be performed annually.*

(5) *Except TC 350 crude tanks.*

(6) *The thickness test does not apply to FRP tanks.*

(7) *Lined tanks not in corrosive service shall have their lining visually inspected but the marking requirements of Clause 7.4.3(e) shall not apply.*

21.1.23

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

21.1.24

Table 7.4 of CSA B620 Minimum thickness for TC and MC 306, 307, and 312 specification tanks manufactured with steel and steel alloys.

(See Clause 7.2.6.2.)

Minimum nominal thickness required in Tables 5.2 or 5.3, 5.4 or 5.5, and 5.6 or 5.7, as applicable, for the specification, US gauge or mm (in)	Nominal decimal equivalent for reference, mm (in)	In-service minimum thickness, mm (in)
19	1.06 (0.0418)	0.97 (0.038)
18	1.21 (0.0478)	1.09 (0.043)
17	1.37 (0.0538)	1.22 (0.048)
16	1.52 (0.0598)	1.37 (0.054)
15	1.71 (0.0673)	1.55 (0.061)
14	1.90 (0.0747)	1.70 (0.067)
13	2.28 (0.0897)	2.06 (0.081)
12	2.66 (0.1046)	2.39 (0.094)
11	3.04 (0.1196)	2.74 (0.108)
10	3.42 (0.1345)	3.07 (0.121)
9	3.80 (0.1495)	3.43 (0.135)
8	4.18 (0.1644)	3.76 (0.148)
7	4.55 (0.1793)	4.09 (0.161)
4.76 (3/16)	4.76 (0.1875)	4.29 (0.169)
6.35 (1/4)	6.35 (0.2500)	5.72 (0.225)
7.94 (5/16)	7.94 (0.3125)	7.14 (0.281)
9.53 (3/8)	9.53 (0.3750)	8.59 (0.338)

21.1.25

Table 7.5 of CSA B620 Minimum thickness for TC and MC 306, 307, and 312 specification tanks manufactured with aluminum and aluminum alloys.

(See Clause 7.2.6.2.)

Minimum nominal thickness required in Tables 5.2 or 5.3, 5.4 or 5.5, and 5.6 or 5.7, as applicable, for the specification, US gauge or mm (in)	In-service minimum thickness, mm (in)
1.98 (0.078)	1.78 (0.070)
2.21 (0.087)	1.98 (0.078)
2.44 (0.096)	2.18 (0.086)
2.77 (0.109)	2.49 (0.098)
3.30 (0.130)	2.97 (0.117)
3.58 (0.141)	3.23 (0.127)
3.84 (0.151)	3.54 (0.136)
4.37 (0.172)	3.94 (0.155)
4.39 (0.173)	3.96 (0.156)
4.93 (0.194)	4.45 (0.175)
5.49 (0.216)	4.93 (0.194)
6.02 (0.237)	5.41 (0.213)
6.86 (0.270)	6.17 (0.243)
9.14 (0.360)	8.23 (0.324)
11.43 (0.450)	10.29 (0.405)
13.72 (0.540)	12.34 (0.486)

21.1.26 NA

NATIONAL ENERGY EQUIPMENT INC.

Confined Spaces Entry Permit

Form Number:NEE-FR-L-102-(REV3) Page 1 of 1 Revision: 3

Date of Issue:	Time Of Issue:
Time Of Entry:	Anticipated Time Out:
Entrant:	Product Last Contained:
Standby Person:	Entry Supervisor:

Type of Work: ☐ Hot Work ☐ Cold Work ☐ Welding ☐ Repairs ☐ Inspection/Cleaning

Type of Work NOT TO BE PERFORMED

Y	N	NA		Y	N	NA	
☐	☐	☐	Job Planning Complete	☐	☐	☐	Safety Harness / Life line Required
☐	☐	☐	Lockout Procedure Followed	☐	☐	☐	Fire Fighting Equipment on Hand
☐	☐	☐	C.S. Product / MSDS/SDS Reviewed	☐	☐	☐	Liquid Present
☐	☐	☐	Reviewed materials MSDS/SDS Sheets	☐	☐	☐	Electrical Tools Grounded Type
☐	☐	☐	Safe Access to Confined Space	☐	☐	☐	GFI & Sealed Extension Cords
☐	☐	☐	Area Cleared of Hazards	☐	☐	☐	Hearing Protection Required
☐	☐	☐	Lines Isolated and Blocked	☐	☐	☐	Face Shield/Glasses Required
☐	☐	☐	Respiratory Protection Required	☐	☐	☐	Head Protection Required
☐	☐	☐	Space Ventilated Prior to Entry	☐	☐	☐	Protective FR clothing
☐	☐	☐	Natural Ventilation	☐	☐	☐	Emergency Eye Wash/Shower
☐	☐	☐	Mechanical Ventilation	☐	☐	☐	Emergency Extraction Kit
☐	☐	☐	Ventilation Required During Entry	☐	☐	☐	Workers Aware of Conditions

RESULTS OF ATMOSPHERIC/EXPLOSIMETER TESTING

Acceptable Atmospheric/Explosimeter Readings

O2% 20.9% LEL 0% CO < 5 ppm H_2S 0 ppm TVOC 0 ppm or similar to background

Instrument #: Calibration Date: Daily Bump Test Completed By

Oxygen %	LEL %	CO	H_2S	TVOC	Date/Time	Time Out

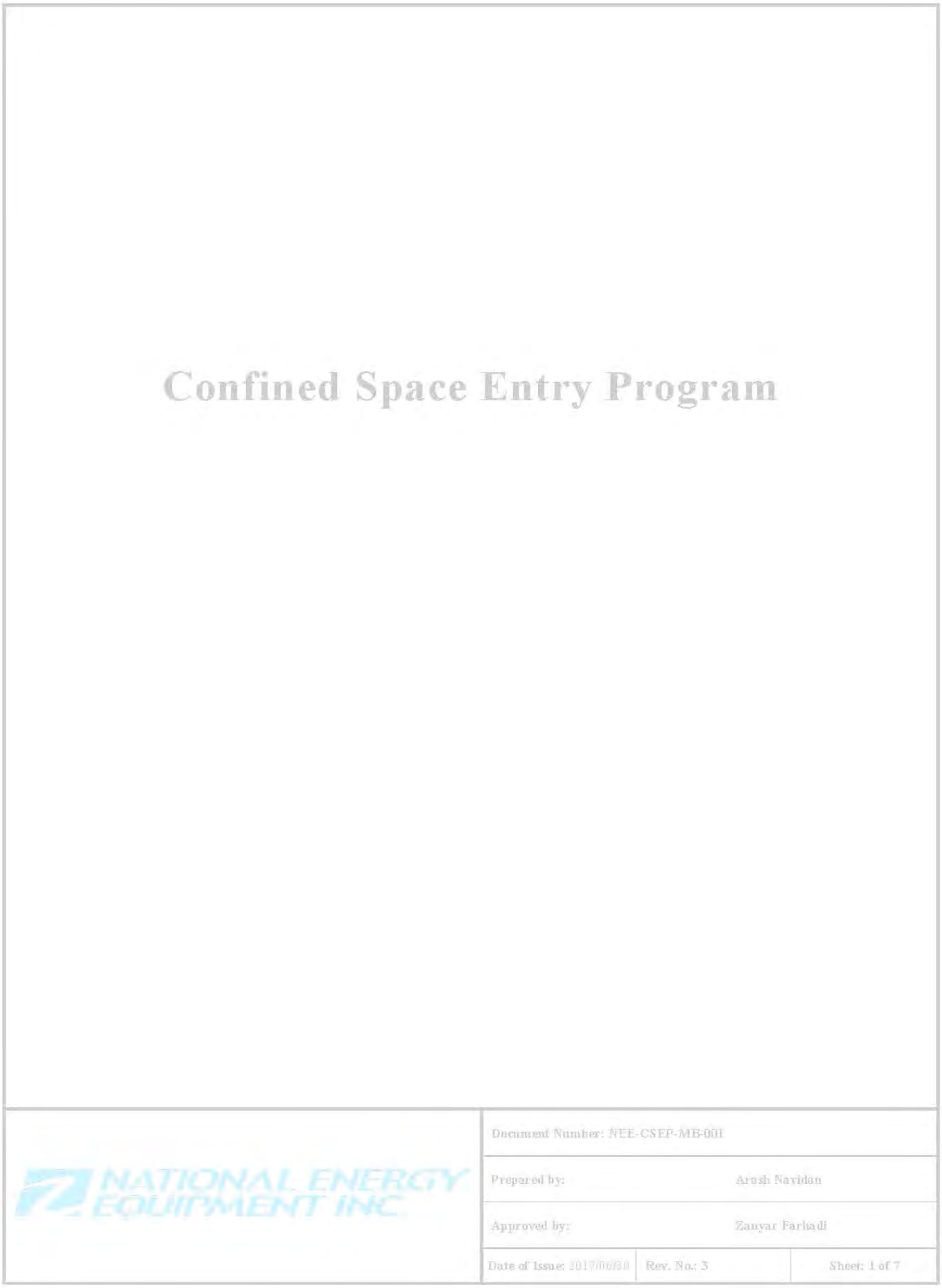
ENTRANT AND SAFETY WATCH SIGNATURES

Entrants	Safety Watch	Time In	Expected Time out	Time Out

Permit Approved By:

Permit Valid Until Midnight on Issue Date
Or Beginning of next shift (whichever comes first)

21.1.27 NA


Confined Space Entry Program
NATIONAL ENERGY EQUIPMENT INC.
Document Number: NEE-CSEP-MB-001
Prepared by: Arash Navidan
Approved by: Zanyar Farhadi
Date of Issue: 2017/06/30
Rev. No.: 3
Sheet: 1 of 7

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NATIONAL ENERGY EQUIPMENT INC.	Confined Space Entry Program
Document Number: NEE-CSEP-MB-001	Date of Issue: 2017/06/30
Prepared by: Arash Navidan	Revision Number: 3
Approved by: Zanyar Farhadi	Sheet Number: 3 of 7

SECTION - 1 Scope

This program governs the entry into Confined Spaces at National Energy Equipment Inc. (NEEI) facilities. It shall be followed by all NEEI employees or employees of any sub-contractors while on mentioned NEEI property.

This program is meant to satisfy the requirements of the Work Safe BC, Occupational Health & Safety Regulation (OHSR), and all provincial legislation related to Confined Space Entry.

SECTION - 2 Definitions and Glossary of Abbreviations

"adjacent piping" means a device such as a pipe, line, duct or conduit which is connected to a confined space or is so located as to allow a substance from within the device to enter the confined space;

"blank" means a solid plate installed through the cross-section of a pipe, usually at a flanged connection;

"blanking or blinding" means the absolute closure of adjacent piping, by fastening across its bore a solid plate or cap that completely covers the bore and that is capable of withstanding the maximum pressure of the adjacent piping;

"blind" means a solid plate installed at the end of a pipe which has at that point been physically disconnected from a piping system;

"clean respirable air" when used to describe the atmosphere inside a confined space, means an atmosphere which is equivalent to clean, outdoor air and which contains

(a) about 20.9% oxygen by volume,

(b) no measurable flammable gas or vapour as determined using a combustible gas measuring instrument, and

(c) no air contaminant in concentrations exceeding either 10% of its applicable exposure limit in section 4.6, or an acceptable ambient air quality standard established by an authority having jurisdiction over environmental air standards, whichever is greater;

"confined space" means an area, other than an underground working, that

(a) is enclosed or partially enclosed,

(b) is not designed or intended for continuous human occupancy,

(c) has limited or restricted means for entry or exit that may complicate the provision of first aid, evacuation, rescue or other emergency response service, and

(d) is large enough and so configured that a worker could enter to perform assigned work;

"disconnecting" means physically disconnecting adjacent piping from a confined space to prevent its contents from entering the space in the event of discharge;

"double block and bleed" means the closure of adjacent piping by locking out a drain or vent in the open position in the line between 2 locked out valves in the closed position;

"harmful substance" means a WHMIS hazardous product, a substance referred to under section 4.6, or a substance which may have a harmful effect on a worker in a confined space;

"high hazard atmosphere" means an atmosphere that may expose a worker to risk of death, incapacitation, injury, acute illness or otherwise impair the ability of the worker to escape unaided from a confined space, in the event of a failure of the ventilation system or respirator;

"inerting" means intentionally flooding the atmosphere inside a confined space with an inert gas such as nitrogen to eliminate the hazard of ignition of flammable vapours inside the confined space but thereby creating an oxygen deficient atmosphere;

"low hazard confined space" means a confined space which is shown by pre-entry testing or otherwise known to contain clean respirable air immediately prior to entry to a confined space and which is not likely to change during the work activity, as determined by a qualified person after consideration of the design, construction and use of the confined space, the work activities to be performed, and all engineering controls required. For example, all brand new B620 tanks and water tanks.

"moderate hazard confined space" means a confined space that is not clean respirable air but is not likely to impair the ability of the worker to escape unaided from a confined space, in the event of a failure of the ventilation system or respirator.

SECTION - 3 Responsibilities

The people who are involved in the process of confined space entry are as follows:

- Entry Supervisor
- Standby Person
- Entrants

Please refer to the section 7 (responsibilities) of the related confined space entry and rescue procedures (NEE-CSP-001, NEE-CSP-002, NEE-CSP-003 or NEE-CSP-004) that accompanies this program for the specific responsibilities details.

SECTION- 4 Procedures

4.1 Confined Space Entry Program

This program provides:

- A method for identifying each confined space at NEEI projects and facilities.
- A review of every confined space to determine the Hazard ratings of each related confined space.
- A method for identifying and evaluating the hazards to which workers may be exposed in confined spaces before allowing entry.
- The development of confined space entry procedures.
- General and plan-specific training of workers.
- The duties of the various workplace parties in the confined space program.
- A hazards assessment that sets out measures, procedures and practices to be followed for safe entry operations when work is to be performed in a confined space.
- Monitoring to test the confined space atmosphere for hazards, such as Oxygen, Combustible gases/vapours, Toxic gases/vapours, total volatile organic compounds (TVOC).
- The means for ensuring unprotected workers are not exposed to hazardous atmospheres.
- A rescue plan and rescue procedures in place before entry into a Confined Space occurs.
- An accountability system, such as a log of authorized entrants into a Confined Space.

4.2 Confined Space Entry, Rescue and Ventilation Procedure

A confined space entry permit must be completed prior to entry. A confined space warning sign must be posted at the entrance to the space. Entry, Rescue and Ventilation procedures of the delivery highway tanks are conducted by the mentioned persons in the section 3 of this document for the following purposes:

- Confined Space Procedure– Propane tanks inspection and grinding only. (NEE-CSP-NA-001)
- Confined Space Procedure – Petroleum tanks inspection only. (NEE-CSP-NA-002)
- Confined Space Procedure – Petroleum tanks repairs including hot work. (NEE-CSP-NA-003)
- Confined Space Procedure – Chemical tanks inspection only. (NEE-CSP-NA-004)

4.3 Confined Space Hazard Assessment

The confined space hazards assessments for the aforementioned confined space entry and rescue procedures are prepared and reported as following Confined space hazard assessment (CSHA) documents:

- Confined Space Hazards Assessment – Propane tanks inspection and grinding only (NEE-CSHA-NA-001)
- Confined Space Hazards Assessment – Petroleum tanks inspection only (NEE- CSHA- NA-002)
- Confined Space Hazards Assessment – Petroleum tanks repairs including hot work (NEE-CSHA-NA-003)
- Confined Space Hazards Assessment – Chemical tanks inspection only (NEE- CSHA- NA-004)

4.4 Records

A copy of the signed confined space entry permits, and any other related information will be kept on file at the NEEI facilityfor a period of no less than three years after completion of the project if no incident or unplanned event occurred during the entry. For any instance where an incident or unplanned event occurred during entry, a record of the permit, test results, and any related information will be kept on file and available for inspection for a period of no less than five years after completion of the project.

SECTION-5 Training Requirements

Prior to permitting workers to work in or around confined spaces, the employer shall ensure that workers are trained in the requirements outlined within in this program.

Training shall be given by a qualified individual or agency.

When there is reason to believe that any worker who has been previously trained does not have the understanding or skill required by this procedure, the employer shall consider re-training.

Every contractor or 3rd party worker having the potential to work in confined spaces shall be made aware of the requirements of the program through initial orientation training and periodic reviews during weekly safety meetings, through the use of bulletins and other communication strategies, etc.

Training certificates will be kept and updated as required.

List of trainings are as follows:

- Safety trainings including:
  - WHMIS 2015 or the most current version,
  - Confined Spaces,
  - LOTO,
  - Transport of Dangerous Goods,
  - FALL ARREST,

- POST Certified,
- First Aid.

- Confined space entry program (this document) training.
- Gas monitor instructions.
- B620 Quality manual training.
- Respiratory protection training.
- Respirator fit testing.
- Equipment manufacturing training.

21.1.28

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 — ___oC to ___oC (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.

21.1.29 NA

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21.1.30 Testing in-service cargo tank manway covers procedure

21.1.30.1 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.

21.1.30.2 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 21.1.30.3 and the procedure described in 21.1.30.4.
- Manway and/or fill opening covers successfully meeting this test per 21.1.30.5 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.

21.1.30.3 Test Equipment (See Figure 1)

- The test fixture for the 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.
- Gauges:

  One (1) applicable pressure gauge, which should be more than the required tank’s test pressure regarding table 7.3 of CSA B620 (see section 21.1.23) for leakage test of other tanks.
- 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.

21.1.30.4 Manway Cover Test Procedures

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

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

21.1.30.4.3 Block the openings in the manhole cover with the devices listed in 21.1.30.3.

21.1.30.4.4 Fill test fixture base with air or water.

21.1.30.4.5 Lay rubber membrane on test base.

21.1.30.4.6 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.

21.1.30.4.7 Install 1 0-30 psig gauge in test base.

21.1.30.4.8 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.

21.1.30.4.9 Slowly increase pressure in tank to the proper test pressure for that tank type, indicated in the Table 7.3 of CSA B620 (see section 21.1.23) for a period of at least 5 minutes:
CAUTION: WATCH PRESSURE. DO NOT OVER-PRESSURIZE.

21.1.30.5 Inspection

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

21.1.30.5.2 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.

21.1.30.5.3 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.

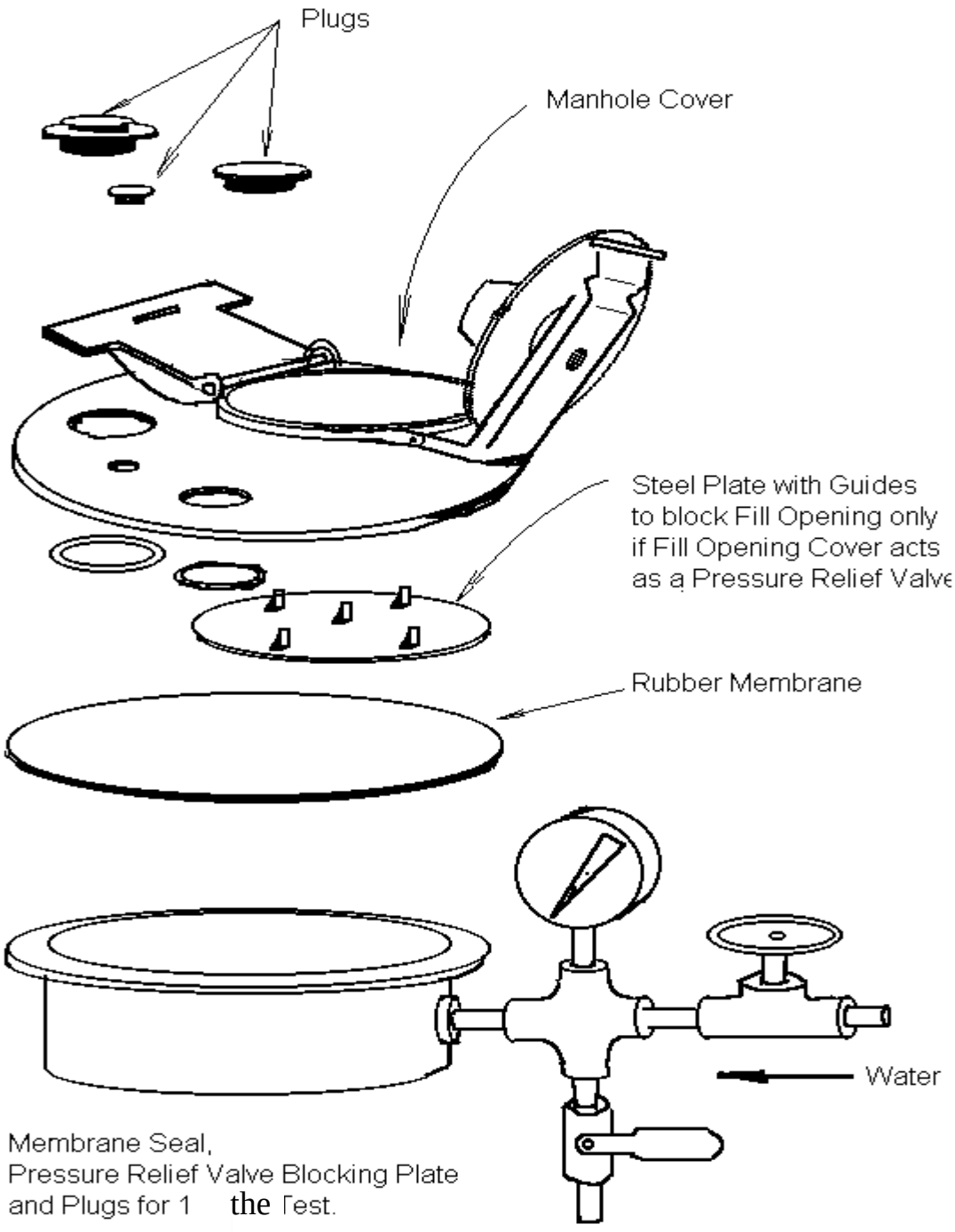

Figure 1 Fixture used in the test.

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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

0-5 PSI Manometer

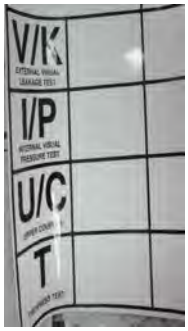
Assorted Hose Test Adapters

Air Compressor

Multigas Detector

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 DATE: XXXXXXX,
Telephone XXXX
Facility Registration No. : 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

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)

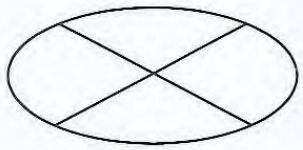
Thickness Tester Calibrated in accordance with instructions provided by the manufacturer of the testing device *YES* ☐ *NO* ☐

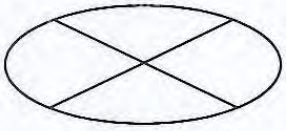
FRONT

	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





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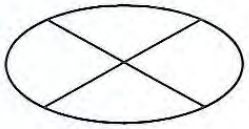
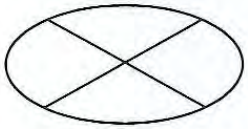
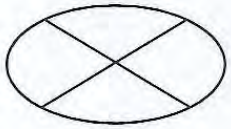


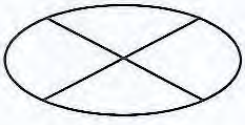
MANWAY



SUMP



NOZZLE



NOZZLE

Tank Tester- Signature_____ Date-

Test and Inspection Report in Accordance with CSA B620

Page 3 of 3

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 ☐

WELD INSPECTION REPORT

Facility Address
XXXXXXXXXXX

Registration Num XX-XXX

OWNERS SERIA XXX
MANUFAC John Doe
MFG DATI XXX 07 MATERIAL: 3454 H-32 XXX
SERIAL NUMBER: 2AE XXX0XXX1XXX
TANK SPEC: 406

Location of welds to be inspected (Provide sketch if required)

Weld cracks on both frame rails at front slide mounts
All positions

John Doe XXX

Welding Process(es): GMAW WPS: NEEP 22-01

	Accept	Reject
Welder Qualification Verified	☒	☐
Porosity and/or inclusions	☒	☐
Complete Fusion	☒	☐
Start and End Complete	☒	☐
Full Penetration	☒	☐
Welder Ident XXX	☒	☐

Welder Name: XXX XXX

Inspector Name: Tom T Signature: Date: Nov 18 2015

This Report must be attached to the Test and Inspection Report for this unit

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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
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3	X	X	X	X	X			53	X	X	X		X		
4	X	X	X	X	X			54	X	X	X		X		
5	X	X	X	X	X			55	X	X	X		X		
6	X	X	X	X	X			56	X	X	X		X		
7	X	X	X	X	X			57	X	X	X		X		
8	X	X	X	X	X			58	X	X	X		X		
9	X	X	X	X	X			59	X	X	X		X		
10	X	X	X	X	X			60	X	X	X		X		
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25	X	X	X	X	X			75					X		
26	X	X	X	X	X			76					X		
27	X	X	X	X	X			77					X		
28	X	X	X	X	X			78					X		
29	X	X	X	X	X			79					X		
30	X	X	X	X	X			80					X		
31	X	X	X	X	X			81					X		
32	X	X	X	X	X			82					X		
33	X	X	X	X	X			83					X		
34	X	X	X	X	X			84					X		
35	X	X	X	X	X			85					X		
36	X	X	X	X	X			86					X		
37	X	X	X	X	X			87					X		
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41	X	X	X	X	X			91					X		
42	X	X	X	X	X			92					X		
43	X	X	X	X	X			93					X		
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45	X	X	X	X	X			95					X		
46	X	X	X	X	X			96					X		
47	X	X	X	X	X			97					X		
48	X	X	X	X	X			98					X		
49	X	X	X		X			99					X		
50	X	X	X		X			100					X		

Page ↓	Revision Number and Latest Issue Date							Page ↓	Revision Number and Latest Issue Date						
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