



Liquefied Natural Gas Waterfront Facilities Safety Regulation

NGS 14/2024

Publication Date: 1 October 2024

Table of Content

Citation4

1	Introduction	4
1.1	Scope and Objectives.....	4
1.2	Application.....	4
1.3	Entry into effect	4
1.4	Definitions.....	4
1.5	Interpretation	7
1.6	List of documents incorporated by reference partly or wholly in these Regulations	7
2	General process	9
2.1	Letter of intent and waterway suitability assessment for waterfront facilities handling LNG.	9
2.2	Letter of intent and operational risk assessment for LNG fuel facilities.	11
2.3	Letter of recommendation.	12
2.4	Reconsideration of the Letter of Recommendation.....	13
2.5	Inspections of waterfront facilities.....	13
2.6	Suspension of transfer operations.....	13
2.7	Appeals.	14
2.8	Alternatives.....	14
2.9	Operations Manual and Emergency Manual: Procedures for examination.	14
3	Waterfront Facilities Handling Liquefied Natural Gas	14
3.1	Design and construction: General.	14
3.2	Piers and wharves.....	15
3.3	Layout and spacing of marine transfer area for LNG.....	15
3.4	Electrical power systems.	15
3.5	Lighting systems.....	16
3.6	Communications systems.	16
3.7	Warning signs.....	17
3.8	Sensing and alarm systems.....	17
3.9	Portable gas detectors.....	18

3.10	Emergency shutdown.	18
3.11	Warning alarms.....	18
3.12	Persons in charge of shoreside transfer operations: Qualifications and certification. ...	18
3.13	Compliance with suspension order.	19
3.14	Operations Manual.....	19
3.15	Emergency Manual.....	19
3.16	Operations Manual and Emergency Manual: Use.....	20
3.17	Motor vehicles.	20
3.18	Bulk storage.	20
3.19	Preliminary transfer inspection	21
3.20	Declaration of inspection.....	21
3.21	LNG transfer.....	22
3.22	Release of LNG.....	23
3.23	Maintenance: General.....	23
3.24	Inspections.....	23
3.25	Repairs.....	23
3.26	Testing.....	24
3.27	Records.	24
3.28	Applicability.	24
3.29	Training: General.	24
3.30	Fire equipment: General.....	25
3.31	Portable fire extinguishers.....	25
3.32	Emergency outfits.....	26
3.33	Fire main systems.	26
3.34	Dry chemical systems.	27
3.35	International shore connection.	27
3.36	Smoking.	27
3.37	Fires.....	27
3.38	Hotwork.	27

Citation

These Regulations may be cited as the LNG Waterfront Facilities Safety Regulation, 2024.

1 Introduction

1.1 Scope and Objectives

- 1) In the exercise of the powers conferred upon it by section 8(3)(c) and 123(a) of the Natural Gas Act, 2024, the Utilities Regulation and Competition Authority (“URCA”) hereby issues these Regulations relating to the marine transfer area for LNG of each waterfront facility handling LNG and to construction in the marine transfer area for LNG of each waterfront facility handling LNG.
- 2) The objectives of these Regulations are to prescribe the safety standards for Waterfront LNG facilities used in the transportation of gas by pipeline by providing detailed requirements for siting, design, construction, equipment, operations, maintenance, and security.

1.2 Application

- 3) These Regulations shall apply to any person holding an LNG Terminal Operator License.

1.3 Entry into effect

- 4) These Regulations shall come into effect on the date of their publication in accordance with section 15(1)(a) of the Natural Gas Act, 2024.

1.4 Definitions

- 5) In these Regulations, any word or expression to which a meaning has been assigned in the Natural Gas Act, 2024 has the meaning so assigned and, unless the context otherwise requires, the following terms will have the following meanings:

“**BPD**” means the Bahamas Port Department.

“**COA**” means the Court of Appeal of the Commonwealth of The Bahamas.

“**Control Room**” means a space within the LNG waterfront facility from which facility operations are controlled.

“**DEPP**” means the Bahamas Department of Environmental Planning and Protection.

“**Environmentally Sensitive Areas**” include public parks and recreation areas, wildlife and waterfowl refuges, fishing grounds, wetlands, other areas deemed to be of high value to fish and wildlife resources, historic sites, and other protected areas.

“**Facility**” means a waterfront facility handling LNG, and includes LNG fuel facilities.

“**Fire Endurance Rating**” means the duration for which an assembly or structural unit will contain a fire or retain structural integrity when exposed to the temperatures specified in the standard time-

temperature curve in ASTM E119-20 (incorporated by reference)¹.

“Impounding Space” means a space formed by dikes and floors that confines a spill of LNG.

“LHG” means liquefied hazardous gas.

“Liquefied Hazardous Gas” (LHG) means a liquid containing one or more of the products listed in Table 1 of this section.

“Liquefied Natural Gas” (LNG) means a liquid or semisolid consisting mostly of methane and small quantities of ethane, propane, nitrogen, or other natural gases.

“Liquefied Petroleum Gas” (LPG) means a liquid consisting mostly of propane or butane or both.

“LNG” means liquefied natural gas.

“LNG Fuel Facility” means a waterfront facility that handles LNG for the sole purpose of providing LNG from shore-based structures to vessels for use as a marine fuel, and that does not transfer LNG to or receive LNG from vessels capable of carrying LNG in bulk as cargo.

“LNG Vessel” means a vessel constructed or converted to carry LNG, in bulk.

“Loading Flange” means the connection or group of connections in the cargo transfer pipeline on the facility that connects the facility pipeline to the vessel pipeline.

“Marine Transfer Area For LNG” means that part of a waterfront facility handling LNG between the vessel, or where the vessel moors, and the last manifold or valve immediately before the receiving tanks.

“Mating Flange” means that flange in the product-transfer pipeline on a waterfront facility handling LNG that connects this pipeline to the pipeline or transfer hose of the vessel.

“MAWP” means maximum allowable working pressure.

“Maximum Allowable Working Pressure” (MAWP) means the maximum gauge pressure permissible at the top of equipment, containers, or pressure vessels while operating at design temperature.

“Operational Risk Assessment” (ORA) means the document required under paragraph 16) in section **Error! Reference source not found.**

“Person in Charge of Transfer Operations on the Vessel” is the person designated the person in charge of cargo transfer.

“Port Controller” means the principal officer of the Port Department or an authorized representative.

“Port Department” means the Bahamas Port Department (BPD) or an authorized representative.

“Release” means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, except a minor release of LHG or its vapor, that may occur during the routine handling of LHG. No release is minor where it creates an

¹ Standard Test Methods for Fire Tests of Building Construction and Materials, approved May 1, 2020.

atmosphere that exceeds the Lower Flammable Limit (LFL) for a flammable product or any Permissible Exposure Limit (PEL) listed in 29 CFR 1910.1000, Table Z-1 or Z-2 (incorporated by reference), for a toxic product.

“Substructure” means the deck of a pier or wharf and the structural components below that deck.

“Territorial Sea” of the Bahamas has the meaning defined by the Archipelagic Waters and Jurisdiction Act Ch 282.

“Toxic Product” means a product indicated by the letter “T” or by the letters “F + T” in in Table 1 of this section.

“UAT” means the Utilities Appeal Tribunal.

“Waterfront Facility Handling LNG” means any structure on, in, or under the territorial sea of The Bahamas, or any structure on land or any area on shore immediately adjacent to such waters, used or capable of being used to transfer liquefied natural gas, in bulk, to or from a vessel.

“Waterway Suitability Assessment” (WSA) means a document assessing the suitability of a waterway for LNG marine traffic pursuant to paragraph 11) **Error! Reference source not found.** in section 2.1. The Preliminary WSA initiates the process of analyzing the safety and security risks posed by proposed LNG tanker operations to a port and waterways, and the Follow-On WSA provides a detailed analysis of the same issues.

Table 1 below provides a classification of products according to their hazard, where “F” indicates a flammable product, “T” indicates a toxic product and “F + T” indicates a product both flammable and toxic.

Table 1 : Classification of products according to hazards

Product	Hazard
Acetaldehyde	F+T
Ammonia, anhydrous	T
Butadiene	F
Butanes	F
Butane and propane (mixtures)	F
Butylenes	F
Chlorine	T
Dimethylamine	F+T
Ethane	F
Ethyl chloride	F+T
Ethylene	F
Ethylene oxide	F+T

Methyl-acetylene and propadiene (mixtures)	F
Methyl bromide	F+T
Methyl chloride	F+T
Propane	F
Propylene	F
Sulphur dioxide	T
Vinyl chloride	F+T

1.5 Interpretation

- 6) In these Regulations, unless the contrary appears:
- a) headings are for convenience only and do not affect interpretation;
 - b) a reference to a statute or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them;
 - c) words in the singular include the plural and vice versa;
 - d) words importing persons include a body whether corporate, politic, or otherwise;
 - e) where a word or phrase is defined, its other grammatical forms have a corresponding meaning;
 - f) mentioning anything after include, includes or including does not limit what else might be included;
 - g) words and expressions which are not defined have the meanings given to them in the Comms Act;
 - h) reference to a person shall include firms or companies; and
 - i) cross references are marked with an open parenthesis. It is expressly stated that the use of an open parenthesis in these cross references bears no legal interpretation. The sole legally pertinent element is the reference number.

1.6 List of documents incorporated by reference partly or wholly in these Regulations

- 7) Certain material is incorporated by reference into these Regulations with the approval of URCA. Any changes to these Regulation will be made by URCA in accordance with its established Consultation Process. Changes to approved material will be made in accordance with the standards specified by the following institutions, said standards being incorporated by reference into these Regulations.

	Subject Matter	Document	Issuing Body
(a)	Standard Test Methods for Fire Tests of Building Construction and Materials, applying to section Definitions 1.4	Standard Test Methods for Fire Tests of Building Construction and Materials, approved May 1, 2020. Cited as: ASTM E119-20	ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA, 19428-2959, 610-832-9500, https://www.astm.org .
(b)	Standard Specification for International Shore Connections for Marine Fire Applications, applying to section 3.35	Standard Specification for International Shore Connections for Marine Fire Applications, approved December 1, 2019. Cited as: ASTM F1121-87 (Reapproved 2019)	ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA, 19428-2959, 610-832-9500, https://www.astm.org .
(c)	Recommended Practice, Development and operation of liquefied natural gas bunkering facilities, applying to section 2.2	Recommended Practice, Development and operation of liquefied natural gas bunkering facilities, October 2015 Edition. Cited as: DNVGL-RP-G105	Det Norske Veritas (DNV), Veritasveien 1, 1363 Høvik Norway, +47 6757 9900, https://www.dnv.com .
(d)	Guidelines for systems and installations for supply of LNG as fuel to ships, applying to section 2.2	ISO/TS 18683:2015 (E), Guidelines for systems and installations for supply of LNG as fuel to ships, First Edition, January 15, 2015. Cited as "ISO/TS 18683".	International Organization for Standardization (ISO), Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, +41 22 749 01 11, https://www.iso.org .
(e)	Petroleum and natural gas industries— Installation and equipment for liquefied natural gas—Ship-to-shore interface and port operations, applying to section 2.2	ISO 28460:2010(E), Petroleum and natural gas industries—Installation and equipment for liquefied natural gas—Ship-to-shore interface and port operations, First edition, December 15, 2010. Cited as: ISO 28460	International Organization for Standardization (ISO), Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, +41 22 749 01 11, https://www.iso.org .
(f)	Standard for Portable Fire Extinguishers, applying to section 3.31	NFPA 10, Standard for Portable Fire Extinguishers, 2018 Edition, effective August 21, 2017. Cited as: NFPA 10	National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, 800-344-3555, https://www.nfpa.org .

(g)	Flammable and Combustible Liquids Code, applying to section 3.18	NFPA 30, Flammable and Combustible Liquids Code, 2018 Edition, effective September 6, 2017. Cited as: NFPA 30	National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, 800-344-3555, https://www.nfpa.org .
(h)	Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, applying to section 3.25	NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2019 Edition, effective July 15, 2018. Cited as: NFPA 51B	National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, 800-344-3555, https://www.nfpa.org .
(i)	Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), applying to sections 2.2, 0, 0 and 3.31	NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2019 Edition, effective November 25, 2018. Cited as: NFPA 59A	National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, 800-344-3555, https://www.nfpa.org .
(j)	National Electrical Code, applying to sections 3.4 and 0	NFPA 70, National Electrical Code, 2020 Edition, effective August 25, 2019. Cited as: NFPA 70	National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, 800-344-3555, https://www.nfpa.org .
(k)	National Electrical Code, applying to section 3.4	CEC, Canadian Electrical Code. Edition 2021. Cited as: CEC	Canadian Standards Association (CSA), 178 Rexdale Blvd. Toronto, ON Canada M9W 1R3.
(l)	Occupational Safety and Health Standards. Air contaminants, applying to section Definitions1.4	29 CFR 1910.1000 Air contaminants. Cited as: 29 CFR 1910.1000	US Code of Federal Regulations (CFR). https://www.ecfr.gov/

2 General process

2.1 Letter of intent and waterway suitability assessment for waterfront facilities handling LNG.

- 8) An owner or operator intending to build a facility handling LNG, or an owner or operator planning new construction to expand marine terminal operations in any facility handling LNG, where the construction or expansion will result in an increase in the size or frequency of LNG marine traffic on

the waterway associated with a facility, must simultaneously submit a Letter of Intent (LOI) to the Bahamas Port Department (BPD) with a copy to URCA. The LOI must meet the requirements in paragraph 9) of this section.

- a) The owner or operator of an LNG facility must submit the LOI to the BPD with a copy to URCA at least one (1) year prior to the start of construction. The LOI must include the nation of registry for, and the nationality or citizenship of the officers and crew serving on board, vessels transporting LNG that are reasonably anticipated to be servicing the LNG facility.

9) Each LOI must contain:

- a) The name, address, and telephone number of the owner and operator;
- b) The name, address, and telephone number of the contact person at URCA with responsibility for siting, construction, and operation;
- c) The name, address, and telephone number of the facility;
- d) The physical location of the facility;
- e) A description of the facility;
- f) The LNG or vessels' characteristics and the frequency of LNG shipments to or from the facility; and
- g) Charts showing waterway channels and identifying commercial, industrial, environmentally sensitive, and residential areas in and adjacent to the waterway used by the LNG vessels en route to the facility, within at least twenty-five (25) kilometers (15.5 miles) of the facility.

10) The owner or operator who submits an LOI under paragraph 8) of this section must notify the BPD and URCA in writing within fifteen (15) calendar days of any of the following:

- a) There is any change in the information submitted under paragraphs 9)a) through 9)g) of this section; or
- b) No LNG transfer operations are scheduled within the next twelve (12) months.

11) An owner or operator intending to build a LNG facility, or an owner or operator planning new construction to expand marine terminal operations in any facility handling LNG, where the construction or expansion will result in an increase in the size or frequency of LNG marine traffic on the waterway associated with a facility, must apply or update as appropriate a Waterway Suitability Assessment (WSA) with the BPD, or an authorized agent, with a copy to URCA. URCA and/or the BPD may request additional information during the review of the WSA or Follow-on WSA.

12) The preliminary WSA must:

- a) Be submitted to the BPD with a copy to URCA with the LOI; and
- b) Provide an initial explanation of the following:

- i) Port characterization;
- ii) Characterization of the LNG facility and LNG tanker route;
- iii) Risk assessment for maritime safety and security;
- iv) Risk management strategies; and
- v) Resource needs for maritime safety, security, and response.

13) The Follow-on WSA must:

- a) Be submitted to the BPD with a copy to URCA as follows:
 - i) The owner or operator of an LNG facility must submit the Follow-on WSA to the BPD with a copy to URCA at least one hundred and eighty (180) calendar days before the owner or operator begins transferring LNG.
- b) Contain a detailed analysis of the elements listed in paragraph 12)b) of this section and paragraph 22) in section 2.3.

14) Until the facility begins operation, owners or operators must:

- a) Annually review their WSAs and submit a report to the BPD with a copy to URCA as to whether changes are required. The deadline for the required annual report should coincide with the date of the BPD Letter of Recommendation, which indicates review and validation of the Follow-on WSA has been completed;
- b) In the event that revisions to the WSA are needed, report to the BPD with a copy to URCA, the details of the necessary revisions, along with a timeline for completion;
- c) Update the WSA where there are any changes in conditions, such as changes to the port environment, the LNG facility, or the tanker route, that would affect the suitability of the waterway for LNG traffic; and
- d) Submit a final report to the BPD with a copy to URCA at least thirty (30) calendar days, but not more than sixty (60) calendar days, prior to the start of operations.

15) An owner or operator intending to construct a LNG fuel facility or modify any LNG fuel facility, may comply with section 2.2 in lieu of meeting the requirements in this section.

2.2 Letter of intent and operational risk assessment for LNG fuel facilities.

16) An owner or operator intending to build a LNG fuel facility, modify construction of any LNG fuel facility electing to complete an operational risk assessment (ORA) in lieu of a WSA as outlined in section 2.1, must submit an LOI and ORA to the BPD with a copy to URCA at least one (1) year prior to the start of LNG transfer operations. Each LOI must contain the information in paragraphs 9)a) through 9)e) in section 2.1.

17) The owner or operator who submits an LOI under paragraph 16) of this section must notify the BPD

and URCA within fifteen (15) calendar days of any of the following:

- a) There is any change in the information submitted under paragraph 16) of this section; or
- b) No LNG fuel transfer operations are scheduled within the next twelve (12) months.

18) The ORA required by paragraph 16) must:

- a) Be carried out in accordance with Chapter 7 of ISO/TS 18683² and Appendix D of DNVGL-RP-G105³; or Chapter 19 of NFPA 59A⁴ (all incorporated by reference); and
- b) Consider possible factors affecting the ship/shore interface and port operations described in Section 6 of ISO 28460⁵ (incorporated by reference).

2.3 Letter of recommendation.

19) After the BPD receives the information and analyses required by sections 2.1 or 2.2, the BPD will issue a Letter of Recommendation (LOR) as to the suitability of the waterway for LNG marine traffic or the operational safety and security of the LNG fuel facility to URCA, sending a copy to the owner or operator, based on the:

- a) Information submitted under sections 2.1 or 2.2;
- b) Density and character of marine traffic in the waterway;
- c) Locks, bridges, or other man-made obstructions in the waterway;
- d) Following factors adjacent to the facility such as:
 - i) Depths of the water;
 - ii) Tidal range;
 - iii) Protection from high seas;
 - iv) Natural hazards, including reefs, rocks, and sandbars;
 - v) Underwater pipelines and cables;
 - vi) Distance of berthed vessel from the channel and the width of the channel; and
- e) Any other issues affecting the safety and security of the waterway and considered relevant by the BPD.

² ISO/TS 18683:2015(E), Guidelines for systems and installations for supply of LNG as fuel to ships, First Edition, January 15, 2015.

³ Recommended Practice, Development and operation of liquefied natural gas bunkering facilities, October 2015 Edition.

⁴ NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2019 Edition, effective November 25, 2018.

⁵ ISO 28460:2010(E), Petroleum and natural gas industries—Installation and equipment for liquefied natural gas—Ship-to-shore interface and port operations, First edition, December 15, 2010.

- 20) An LOR issued under this section is a recommendation from the BPD to the agency having jurisdiction as described in paragraph 19), and does not constitute agency action for the purposes of section 2.7.
- 21) The owner or operator or other entities in the vicinity of the facility, may request reconsideration as set forth in section 2.4.
- 22) Persons other than the owner or operator, or local government in the vicinity of the facility, may comment on the LOR by submitting comments and relevant information to URCA in accordance with URCA's consultation process as a part of that agency's permitting process.

2.4 Reconsideration of the Letter of Recommendation.

- 23) A person requesting reconsideration pursuant to paragraph 21) in section 2.3 must submit a written request to the BPD. The request must explain why the BPD should reconsider his or her recommendation.
- 24) In response to a request described in paragraph 23) of this section, the BPD will do one of the following:
 - a) Send a written confirmation of the LOR to the agency to which the LOR was issued, with copies to the person making the request and the owner or operator; or
 - b) Revise the LOR, and send the revised LOR to the agency to which the original LOR was issued, with copies to the person making the request and the owner or operator.
- 25) A person whose request for reconsideration results in a confirmation as described in paragraph 24)a) of this section, and who is not satisfied with that outcome, may request, in writing, to the UAT in accordance with section 109 of the Natural Gas Act, 2024.

2.5 Inspections of waterfront facilities.

- 26) The operator must ensure that URCA is allowed to make reasonable examinations and inspections to determine whether the facility meets these Regulations.

2.6 Suspension of transfer operations.

- 27) The Port Controller may issue an order to the operator to suspend LNG transfer operations where the Port Controller finds any condition requiring immediate action to:
 - a) Prevent damage to, or the destruction of, any bridge or other structure on or in the territorial sea of The Bahamas, or any land structure or shore area immediately adjacent to such waters; and
 - b) Protect the territorial sea of the Bahamas and the resources therein from harm resulting from vessel or structure damage, destruction, or loss.
- 28) Each order to suspend transfer operations issued under paragraph 27) of this section:
 - a) Is effective immediately;
 - b) Contains a statement of each condition requiring immediate action; and

- c) Is withdrawn by the Port Controller whenever each condition is corrected or no longer exists.

2.7 Appeals.

- 29) A party aggrieved by a decision or reconsideration of a decision under these Regulations may appeal to the UAT in accordance with section 109 of the Natural Gas Act, 2024.

2.8 Alternatives.

- 30) The Port Controller may allow alternative procedures, methods, or equipment standards, to be used by an operator instead of any requirements in these Regulations if:

- a) The operator submits a written request for the alternative at least thirty (30) days before facility operations under the alternative would begin, unless the Port controller authorizes a shorter time; and
- b) The alternative provides at least the same degree of safety provided by the regulations in this part.

- 31) The Port Controller approves or disapproves any alternative requested under this section in writing or orally, with subsequent written confirmation.

2.9 Operations Manual and Emergency Manual: Procedures for examination.

- 32) At least thirty (30) calendar days before transferring LNG, the owner or operator of a new facility must submit an Operations Manual and Emergency Manual in printed or electronic format to the BPD and URCA.

- 33) Operations Manuals and Emergency Manuals submitted must include a date, revision date or other revision-specific identifying information.

- 34) Where the BPD finds that the Operations Manual meets section 3.14 and that the Emergency Manual meets section 3.15, the BPD will provide notice to the facility stating each manual has been examined by the BPD. This notice will include the revision date of the manual or other revision-specific identifying information.

- 35) Where the BPD finds that the Operations Manual or the Emergency Manual does not meet these Regulations, the BPD will notify the facility and URCA with an explanation of why it does not meet these Regulations.

3 Waterfront Facilities Handling Liquefied Natural Gas

Design and construction

3.1 Design and construction: General.

- 36) The marine transfer area for LNG must meet the following criteria in NFPA 59A⁶ (incorporated by reference):

⁶ NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2019 Edition, effective November 25, 2018.

- a) Chapter 5, Section 5.3.1.7;
- b) Chapter 6, Section 6.7;
- c) Chapter 10;
- d) Chapter 11, except Sections 11.9, and 11.10;
- e) Chapter 12;
- f) Chapter 15, except Sections 15.4 and 15.6; and
- g) Annex B.

3.2 Piers and wharves.

- 37) Where the waterfront facility handling LNG is in a region subject to earthquakes and hurricanes, the piers and wharves must be designed to resist earthquake forces.
- 38) Substructures, except moorings and breasting dolphins, that support or are within five 5 meters (16.4 feet) of any pipe or equipment containing LNG, or are within 15 meters (49.2 feet) of a loading flange, must:
 - a) Be made of concrete or steel; and
 - b) Have a fire endurance rating of not less than two hours.
- 39) LNG storage tanks must have the minimum volume necessary for:
 - a) Surge protection;
 - b) Pump suction supply; or
 - c) Other process needs.

3.3 Layout and spacing of marine transfer area for LNG.

- 40) LNG impounding spaces must be located so that the heat flux from a fire over the impounding spaces does not cause structural damage to an LNG vessel moored or berthed at the waterfront facility handling LNG.
- 41) Each LNG loading flange must be located at least 300 meters (984.3 feet) from the following which are primarily intended for the use of the general public or railways:
 - a) Each bridge crossing a navigable waterway;
 - b) Each entrance to any tunnel under a navigable waterway.

3.4 Electrical power systems.

- 42) The electrical power system must have a power source and a separate emergency power source, so

that failure of one source does not affect the capability of the other source. The system must meet the requirements of the CEC⁷ and the NFPA 70⁸ (incorporated by reference). In the case where there is conflict between the two codes the CEC shall prevail. In cases where the codes allow a similar but varying degree of compliance, the more stringent requirement shall prevail.

- 43) The emergency power source must provide enough power for the operation of the:
- a) Emergency shutdown system;
 - b) Communications equipment;
 - c) Firefighting equipment; and
 - d) Emergency lighting.
- 44) Where an auxiliary generator is used as an emergency power source, it must meet Section 700.12 of NFPA 70 (incorporated by reference).

3.5 Lighting systems.

- 45) The marine transfer area for LNG must have a lighting system and separate emergency lighting.
- 46) All outdoor lighting must be located or shielded so that it is not confused with any aids to navigation and does not interfere with navigation on the adjacent waterways.
- 47) The lighting system must provide an average illumination on a horizontal plane one meter (3.3 feet) above the deck that is:
- a) 54 lux (five foot-candles) at any loading flange; and
 - b) 11 lux (one foot-candle) at each work area.
- 48) The emergency lighting must provide lighting for the operation of the:
- a) Emergency shutdown system;
 - b) Communications equipment; and
 - c) Firefighting equipment.

3.6 Communications systems.

- 49) The marine transfer area for LNG must have a ship-to-shore communication system and a separate emergency ship-to-shore communication system.
- 50) Each ship-to-shore communication system must be a dedicated system that allows voice communication between the person in charge of transfer operations on the vessel, the person in charge of shoreside transfer operations, and personnel in the control room.

⁷ CEC, Canadian Electrical Code. Edition 2021.

⁸ NFPA 70, National Electrical Code, 2020 Edition, effective August 25, 2019.

3.7 Warning signs.

51) The marine transfer area for LNG must have warning signs that:

- a) Meet paragraph 52) of this section;
- b) Can be seen from the shore and the water; and
- c) Have the following text:

Warning

Dangerous Cargo

No Visitors

No Smoking

No Open Lights

52) Each letter in the words on the sign must be:

- a) Block style;
- b) Black on a white background read boarder; and
- c) 7.6 centimeters (3 inches) high.

Equipment

3.8 Sensing and alarm systems.

53) Fixed sensors must have audio and visual alarms in the control room and audio alarms nearby.

54) Fixed sensors that continuously monitor for LNG vapors must:

- a) Be in each enclosed area where vapor or gas may accumulate; and
- b) Meet Section 16.4 of NFPA 59A⁹ (incorporated by reference).

55) Fixed sensors that continuously monitor for flame, heat, or products of combustion must:

- a) Be in each enclosed or covered Class I, Division 1, hazardous location defined in Section 500.5(B)(1) of NFPA 70¹⁰ (incorporated by reference) and each area in which flammable or combustible material is stored; and
- b) Meet Section 16.4 of NFPA 59A (incorporated by reference).

⁹ NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2019 Edition, effective November 25, 2018.

¹⁰ NFPA 70, National Electrical Code, 2020 Edition, effective August 25, 2019.

3.9 Portable gas detectors.

56) The marine transfer area for LNG must have at least 2 portable gas detectors capable of measuring 0-100% of the lower flammable limit of methane.

3.10 Emergency shutdown.

57) Each transfer system must have an emergency shutdown system that:

- a) Can be activated manually; and
- b) Is activated automatically when the fixed sensors under paragraph 54) of section 0 measure LNG concentrations exceeding 40% of the lower flammable limit.

3.11 Warning alarms.

58) The marine transfer area for LNG must have a rotating or flashing amber light with a minimum effective flash intensity, in the horizontal plane, of 5000 candelas. At least 50% of the required effective flash intensity must be maintained in all directions from 1.0 degree above to 1.0 degree below the horizontal plane.

59) The marine transfer area for LNG must have a siren with a minimum 1/3-octave band sound pressure level at 1 meter of 125 decibels referenced to 0.0002 microbars. The siren must be located so that the sound signal produced is audible over 360 degrees in a horizontal plane.

60) Each light and siren must be located so that the warning alarm is not obstructed for a distance of 1.6 km (1 mile) in all directions.

Operations

3.12 Persons in charge of shoreside transfer operations: Qualifications and certification.

61) No person may serve, and the operator of the waterfront facility handling LNG may not use the services of any person, as a person in charge of shoreside transfer operations, unless that person:

- a) Has at least forty- eight (48) hours of LNG transfer experience;
- b) Knows the hazards of LNG;
- c) Knows the rules of this subpart; and
- d) Knows the procedures in the examined Operations Manual and the examined Emergency Manual in sections 3.14 and 3.15.

62) Before a person in charge of shoreside transfer operations supervises a transfer, the operator must certify in writing that the criteria in paragraph 61) of this section are met. The operator must maintain a copy of each current certification available for inspection at the waterfront facility handling LNG.

3.13 Compliance with suspension order.

63) Where an order to suspend is given to the operator or owner of the waterfront facility handling LNG, no LNG transfer operations may be conducted at the facility until the order is withdrawn by the Port Controller.

3.14 Operations Manual.

64) Each Operations Manual must contain:

- a) A description of the transfer system including mooring areas, transfer connections, control rooms, and diagrams of the piping and electrical systems;
- b) The duties of each person assigned for transfer operations;
- c) The maximum relief valve setting or maximum allowable working pressure of the transfer system;
- d) The facility telephone numbers of facility supervisors, persons in charge of shoreside transfer operations, personnel on watch in the marine transfer area for LNG, and security personnel;
- e) A description of the security systems for the marine transfer area for LNG;
- f) The procedures for:
 - i) Transfer operations including gauging, cool down, pumping, venting, and shutdown;
 - ii) Transfer operations start-up and shutdown;
 - iii) Security violations; and
 - iv) The communications systems; and
- g) A description of the training programs established under section 3.29.

3.15 Emergency Manual.

65) Each Emergency Manual must contain:

- a) LNG release response procedures, including contacting local response organizations;
- b) Emergency shutdown procedures;
- c) A description of the fire equipment and systems and their operating procedures;
- d) A description of the emergency lighting and emergency power systems;
- e) The telephone numbers of local emergency response organizations;
- f) Where the waterfront facility handling LNG has personnel shelters, the location of and provisions in each shelter;

- g) First aid procedures and where there are first aid stations, the locations of each station; and
- h) Emergency procedures for mooring and unmooring a vessel.

3.16 Operations Manual and Emergency Manual: Use.

66) Operator must ensure that:

- a) LNG transfer operations are not conducted unless the person in charge of transfer for the waterfront facility handling LNG has in the marine transfer area a readily available printed or electronic copy of the most recently examined Operations Manual and Emergency Manual. Electronic devices used to display the manuals must comply with applicable electrical safety standards in these Regulations;
- b) Each transfer operation is conducted in accordance with the examined Operations Manual; and
- c) Each emergency response is in accordance with the examined Emergency Manual.

3.17 Motor vehicles.

67) The operator must designate and mark parking spaces that:

- a) Do not block fire lanes;
- b) Do not impede any exits;
- c) Are not located in any impounding space; and
- d) Are not within 15 meters (49.2 feet) of any storage tank or loading flange.

68) During transfer operations, no person may:

- a) Stop or park a motor vehicle in a space that is not designated a parking space; or
- b) Refuel any motor vehicle.

3.18 Bulk storage.

69) The operator must ensure that only the following flammable materials are stored in the marine transfer area for LNG:

- a) LNG;
- b) LPG;
- c) Vessel fuel;
- d) Oily waste from vessels; and
- e) Solvents, lubricants, paints, and other fuels in the amount used for one day's operations and maintenance.

70) Flammable liquids must be stored in accordance with NFPA 30¹¹ (incorporated by reference).

3.19 Preliminary transfer inspection

71) Before transferring LNG, the person in charge of shoreside transfer operations must:

- a) Inspect the transfer piping and equipment to be used during the transfer and replace any worn or inoperable parts;
- b) For each of the vessel's cargo tanks from which cargo will be transferred, note the pressure, temperature, and volume to ensure they are safe for transfer;
- c) Review and agree with the person in charge of cargo transfer on the vessel to:
 - i) The sequence of transfer operations;
 - ii) The transfer rate;
 - iii) The duties, location, and watches of each person assigned for transfer operations; and
 - iv) Emergency procedures from the examined Emergency Manual.
- d) Ensure that transfer connections allow the vessel to move to the limits of its moorings without placing strain on the loading arm or transfer piping system;
- e) Ensure that each part of the transfer system is aligned to allow the flow of LNG to the desired location;
- f) Ensure that warning signs that warn that LNG is being transferred, are displayed;
- g) Eliminate all ignition sources in the marine transfer area for LNG;
- h) Ensure that personnel are on duty in accordance with the examined Operations Manual; and
- i) Test the following to determine that they are operable:
 - i) The sensing and alarm systems;
 - ii) The emergency shutdown system; and
 - iii) The communication systems.

3.20 Declaration of inspection.

72) After the preliminary transfer inspection under section 3.19 has been satisfactorily completed, the person in charge of shoreside transfer operations must ensure that no person transfers LNG until a Declaration of Inspection that meets paragraph 74) of this section is executed and signed in duplicate.

73) The person in charge of shoreside transfer operations must give one signed copy of the Declaration

¹¹ NFPA 30, Flammable and Combustible Liquids Code, 2018 Edition, effective September 6, 2017.

of Inspection to the person in charge of transfer operations on the vessel, and must retain one signed copy at the waterfront facility handling LNG for thirty (30) calendar days after completion of the transfer.

74) Each Declaration of Inspection must contain:

- a) The name of the vessel and the waterfront facility handling LNG;
- b) The date and time that transfer operations begin;
- c) A list of the requirements in 3.19 with the initials of the person in charge of shoreside transfer operations after each requirement, indicating that the requirement is met;
- d) The signature of the person in charge of shoreside transfer operations and the date and time of signing, indicating that he or she is ready to begin transfer operations; and
- e) The signature of each relief person in charge and the date and time of each relief.

3.21 LNG transfer.

75) During LNG transfer operations, the following must be met:

- a) The operator of the waterfront facility handling LNG must ensure that:
 - i) The marine transfer area for LNG is under the supervision of a person in charge, who has no other assigned duties during the transfer operation;
 - ii) Personnel transferring fuel or oily waste are not involved in LNG transfer; and
 - iii) No vessels are moored outboard of any LNG vessel without the permission of the Port Controller.
- b) The person in charge of shoreside transfer operations must:
 - i) Be in continuous communication with the person in charge of transfer operations on the vessel;
 - ii) Ensure that an inspection of the transfer piping and equipment for leaks, frost, defects, and other symptoms of safety and operational problems is conducted at least once every transfer;
 - iii) Ensure that transfer operations are discontinued:
 - (1) Before electrical storms or uncontrolled fires are adjacent to the marine transfer area for LNG; and
 - (2) As soon as a fire is detected; and
 - iv) Ensure that the lighting systems are turned on between sunset and sunrise.

3.22 Release of LNG.

76) The operator of the waterfront facility handling LNG must ensure that:

- a) No person releases LNG into the territorial sea of the Bahamas ; and
- b) Where there is a release of LNG, vessels near the facility are notified of the release by the activation of the warning alarm.

77) Where there is a release of LNG, the person in charge of shoreside transfer operations must:

- a) Immediately notify the person in charge of cargo transfer on the vessel of the intent to shutdown;
- b) Shutdown transfer operations;
- c) Notify the DEPP, BPD and URCA of the release; and
- d) Not resume transfer operations until authorized by the Port Controller.

Maintenance

3.23 Maintenance: General.

78) The operator of the waterfront facility handling LNG must ensure that the equipment required under these Regulations is maintained in a safe condition so that it does not cause a release or ignition of LNG.

3.24 Inspections.

79) The operator must conduct a visual inspection for defects of each pressure-relief device not capable of being tested, at least once each calendar year, with intervals between inspections not exceeding fifteen (15) months, and make all repairs in accordance with section 3.25.

3.25 Repairs.

80) The operator must ensure that:

- a) Equipment repairs are made so that:
 - i) The equipment continues to meet the applicable requirements in this subpart and in NFPA 59A¹² (incorporated by reference); and
 - ii) Safety is not compromised; and
- b) Welding is done in accordance with NFPA 51B¹³ and Section 10.4.3 of NFPA 59A (both incorporated by reference).

¹² NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2019 Edition, effective November 25, 2018.

¹³ NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2019 Edition, effective July 15, 2018.

3.26 Testing.

81) The operator must pressure test under paragraph 82) of this section the transfer system, including piping, hoses, and loading arms, and verify the set pressure of the safety and relief valves:

- a) After the system or the valves are altered;
- b) After the system or the valves are repaired;
- c) After any increase in the MAWP; or
- d) For those components that are not continuously kept at cryogenic temperature, at least once each calendar year, with intervals between testing not exceeding fifteen (15) months.

82) The pressure for the transfer system test under paragraph 81) of this section must be at 1.1 times the MAWP and be held for a minimum of thirty (30) minutes.

3.27 Records.

83) The operator must keep on file the following information:

- a) A description of the components tested under section 3.26;
- b) The date and results of the test under section 3.26; and
- c) A description of any corrective action taken after the test.

84) The information required by this section must be retained for twenty-four (24) months.

Personnel Training

3.28 Applicability.

85) The training required by section 3.29 must be completed before LNG is transferred.

3.29 Training: General.

86) The operator shall ensure that each of the following is met:

- a) All full-time employees have training in the following subjects:
 - i) Basic LNG firefighting procedures; and
 - ii) LNG properties and hazards.
- b) In addition to the training under paragraph 86) a) of this section, each person assigned for transfer operations has training in the following subjects:
 - i) The examined Operations Manual and examined Emergency Manual;
 - ii) Advanced LNG firefighting procedures;

- iii) Security violations;
- iv) LNG vessel design and cargo transfer operations;
- v) LNG release response procedures; and
- vi) First aid procedures for:
 - (1) Frostbite;
 - (2) Burns;
 - (3) Cardiopulmonary resuscitation; and
 - (4) Transporting injured personnel.
- c) The personnel who received training under paragraphs 86)(a) and b) of this section receive refresher training in the same subjects at least once every five (5) years.

Firefighting

3.30 Fire equipment: General.

- 87) Fire equipment and systems provided in addition to the requirements in these Regulations must meet the requirements of these Regulations.
- 88) The following must be red or some other conspicuous color and be in locations that are readily accessible:
- a) Hydrants and standpipes;
 - b) Hose stations;
 - c) Portable fire extinguishers; and
 - d) Fire monitors.
- 89) Fire equipment, where applicable, must bear the approval of Underwriters Laboratories, Inc., the Factory Mutual Research Corp., or the Coast Guard.

3.31 Portable fire extinguishers.

- 90) Each marine transfer area for LNG must have:
- a) Portable fire extinguishers that meet Section 16.6.1 of NFPA 59A¹⁴ and Chapter 6 of NFPA 10¹⁵ (both incorporated by reference); and

¹⁴ NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2019 Edition, effective November 25, 2018.

¹⁵ NFPA 10, Standard for Portable Fire Extinguishers, 2018 Edition, effective August 21, 2017.

- b) At least one portable fire extinguisher in each designated parking area.

3.32 Emergency outfits.

- 91) There must be an emergency outfit for each person whose duties include fighting fires, but there must be at least two (2) emergency outfits. Each emergency outfit must include:
- a) One explosion-proof flashlight;
 - b) Boots and gloves of rubber or other electrically nonconducting material;
 - c) A rigid helmet that protects the head against impact;
 - d) Water resistant clothing that also protects the body against fire; and
 - e) U.S. Bureau of Mines approved self-contained breathing apparatus.
- 92) Emergency outfits under paragraph 91) of this section must be in locations that are readily accessible and marked for easy recognition.

3.33 Fire main systems.

- 93) Each marine transfer area for LNG must have a fire main system that provides at least two (2) water streams to each part of the LNG transfer piping and connections, one of which must be from a single length of hose or from a fire monitor.
- 94) The fire main must have at least one (1) isolation valve at each branch connection and at least one (1) isolation valve downstream of each branch connection to isolate damaged sections.
- 95) The fire main system must have the capacity to supply:
- a) Simultaneously all fire hydrants, standpipes, and fire monitors in the system; and
 - b) At a Pitot tube pressure of 618 kilonewtons per square meter (75 p.s.i.), the two (2) outlets having the greatest pressure drop between the source of water and the hose or monitor nozzle, when only those two (2) outlets are open.
- 96) Where the source of water for the fire main system is capable of supplying a pressure greater than the system's design working pressure, the system must have at least one (1) pressure relief device.
- 97) Each fire hydrant or standpipe must have at least one length of hose of sufficient length to meet paragraph 93) of this section.
- 98) Each length of hose must:
- a) Be 1 1/2 inches or more in diameter and 30.5 meters (100 feet) or less in length;
 - b) Be on a hose rack or reel;
 - c) Be connected to the hydrant or standpipe at all times; and

- d) Have a Coast Guard approved combination solid stream and water spray fire hose nozzle.

3.34 Dry chemical systems.

99) Each marine transfer area for LNG must have a dry chemical system that provides at least two (2) dry chemical discharges to the area surrounding the loading arms, one of which must be:

- a) From a monitor; and
- b) Actuated and, except for pre-aimed monitors, controlled from a location other than the monitor location.

100) The dry chemical system must have the capacity to supply simultaneously or sequentially each hose or monitor in the system for forty-five (45) seconds.

101) Each dry chemical hose station must have at least one (1) length of hose that:

- a) Is on a hose rack or reel; and
- b) Has a nozzle with a valve that starts and stops the flow of dry chemical.

3.35 International shore connection.

102) The marine transfer area for LNG must have an international shore connection that is in accordance with ASTM F1121-87 (Reapproved 2019) (incorporated by reference)¹⁶, a 2 1/2 inch fire hydrant, and 2 1/2 inch fire hose of sufficient length to connect the fire hydrant to the international shore connection on the vessel.

3.36 Smoking.

103) In the marine transfer area for LNG, the operator must ensure that no person smokes when there is LNG present.

3.37 Fires.

104) In the marine transfer area for LNG, the operator must ensure that there are no fires when there is LNG present.

3.38 Hotwork.

105) The operator must ensure that no person conducts welding, torch cutting, or other hotwork unless that person has a permit from the Port Controller.

¹⁶ Standard Specification for International Shore Connections for Marine Fire Applications, approved December 1, 2019.