SPS 340.60 Liquefied Natural Gas Systems (LNG) Checklist
Production, Storage, and Handling of LNG NFPA 59-A - 2009 Ed

Owner: _____City; _____State/zip_____

Location: _____ Contact Phone: _____ Cell: _____

Tank Manufacturers_____ Tank Capacity _____ Year Built _____

Vessel Marking: _____ NB No._____ Serial No. _____ MAWP _____ QTY. _____

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Code Section	**Item Description**	**Code Section**	**Item Description**
5.2	**Plant Site Provisions**	7.5.2.3	Pneumatic Mortar aci 506r
5.2.1	Written site evaluation prepared	7.5.2.4 (A)	High tensile elements prestressed concrete ASTM A 227, ASTM A 416, ASTM A 421, ASTM A 821, API 620
	1) Potential incidents & mitigating measures		
	2) Adjacent activities		
	3) Severe Weather patterns 100 year period	7.5.2.5	Reinforcing steel for reinforced concrete ASTM A 82, ASTM A 185
	4) Other natural hazards		
	5) Security	7.5.3	**Construction, Inspection, and Tests**
5.2.2	All-weather accessibility for Pers. safety and	7.5.3.1 (1)	Concrete containers ACI 318 & 344R-W
5.2.3	Site Provisions for Spill and Leak Control	7.5.3.2	Inspected to ACI 311.4R
5.3.1.2	Impound Area and type Acceptable	7.5.3.3	Metal Containers Tested and Insp. API 620
	(a) Containers	7.6 (1-7)	Markings of Containers
	(b) Process areas	7.9.5.1 &	Capacity of PRV base on (1 thru 7)
	(c) Vaporization areas	7.9.7.4	Computations for sizing valves
	(d) Transfer areas	8.1	**Vaporization Facilities**
	(e) Areas surrounding flammable refrigerant	8.3.1	Design, fab and insp. ASME VIII –260 TO 100F
5.3.4.1	Minimum separation between containers Table 5.3.4.1.	8.4.1	Two inlet valves with vent valve in supply
5.3.6.1	Process Equipment >50ft from ignition	8.4.4.1	Heated Vaporizer heat source shut off 50ft
5.3.7.3	Loading Unloading connections >50ft	8.5.1	Vaporizer relief valve 110% vapor. Cap
6.1	**Process Systems**	9.2.1	**All piping B31.3**
6.3.1	Pumps and Compressors designed Temp/Pres	9.3.2.1	**NO!** Type F spiral welded or furnace butt
6.3.5	Pumps and Compressor pressure relief device	9.3.2.3	Threaded pipe at least schedule 80
6.5.2 & .3	Boilers and Pressure vessels ASME	9.3.3.2	**NO!** Cast-iron, malleable-iron, & ductile
6.5.4	Shell & Tube heat exchanges built Sec VIII	9.3.3.1	Fittings Schedule 80
7.3.1.2	LNG Containers in contact LNG –20F are	9.3.3.5	No compression fitting under –20F
7.3.1.3 (C)	Piping to be design ASME VIII or B31.3	9.4.2.6	Container connection >1" equipped one of
7.3.2	Seismic Design		1. auto close valve fire exposed
7.3.7	**Foundations**		2.remote quick operating valve nor- close
7.3.7.4 (2)	Bottom outer tank protected from corrosion		3. check valve on filling connections
7.3.7.3	Outer tank ground contact requirements	9.4.3.1	Welding-ASME B31.3, 328.2,
7.3.7.3	Tank bottom temp monitoring system oper	9.4.3.2	IMPACT-TESTED MATERIALS, QUA
7.4	**Metal Containers**	9.4.3.4	No Oxygen-fuel gas welding
7.4.1	15 or less psi comply with API 620 A-Q 100 % RT a), b), c).	9.4.4 (1)	Piping shall be color-coded
		9.7.1.1	Pressure tests ASME B31.3, section 345
7.4.2.1	Double walled and Evacuated	9.7.3.2	All circum butt welds shall be RT or UT
7.4.2.3	Inner tank of welded Construction, ASME Stamped and registered	9.7.3.3	All socket welds and fillet welds PT or MT
		9.7.3.4	All full penetration for branch shall be
7.4.2.3 (E)	The outer tank shall have relief device	9.7.3.4 (1)	Examined thoroughly by in-process 344.7
7.5	**Concrete Containers**	9.7.5.1 & 2	Life time records and storage
7.5.1.1	Comply with ACI 318 / 344R-W	9.9.3	Liquid lines expansion relief valves install
7.5.1.3	Reinforcing bars limited to Table 4-3.2.3	10.2* 10.5	Level-temp-pressure-vacuum gages install
7.5.2.1 A(1)	Concrete handling requirements ACI 318	10.6	Fail safe emergency shutdown
7.5.2.1 (B)	Concrete Properties test data available		
7.5.2.2 A(1)	Aggregate specification ASTM C 33		

Owner Installer: _____ Page 2

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Code Section	**Item Description**	**Code Section**	**Item Description**
11.1	**Transfer of LNG and refrigerants**	**13.1**	**Stationary ASME 100,000 gallons or less**
11.2.1	Posted " No Smoking"	13.1.2	Aggregate storage cap 280,000 gallons
11.2.2	Multiple products un /loaded identified	13.2.1	Site prep provisions for spills
11.3.1	Isolation valves installed at extremity of each transfer system	13.2.2	All-weather accessibility to site
11.4.1	Remote Pump/Comp Shut down min 25'	13.2.3	Storage & Transfer secured if unattended
11.4.4	Signal lights shall be provided at Un/Load for remote pump /comp, idle/operating	13.2.4	Operating instructions of emergency controls shall be posted
11.6	**Tank Vehicle and Car Un/Loading**	13.3.1	All piping between inner & outer containers in accordance ASME VIII or ANSI B31.3
11.6.5	Piping, pumps, comp protected barriers	13.3.5	Containers double-walled
11.6.6	Shutoff valves and bleed connections	13.3.6	Inner Tank ASME sect VIII
11.6.7	Bleeds or vents safe place of discharge	13.7.1	Product retention valves (Liquid & vapor)
11.6.8	Emergency valve for liquid and vapor at least 25' not more 100'	13.14.1 13.14.1 (1)	All piping ANSI B31.3 No F piping, spiral welded, & furnace butt
11.6.8.1	Un/Loading closer than 25' valve installed 25' to 100'	13.14.1 (2) 13.14.1 (5)	Welders qualified ASME IX All pipe below -20F Austenitic Stainless
11.8	**Hoses and Arms**	13.15	**Container Instrumentation**
11.8.1	Hoses or arms designed temp & press	13.15.2	Equipped with Level Gauging
11.8.2	Hoses shall be approved for service	13.15.4	PRV shall vent to atmosphere
11.8.3	Flexible metallic hose/pipe below -60F	13.15.5	PRV sized with 7.9.5 or CGA S-1.3
11.8.6	Hoses shall be inspected & tested annually	13.15.6	Inner container PRV manual full open stop valve to isolate it from the container
11.9	**Communications and Lighting**	13.15.6.1	The INNER PRV stop valve shall be lockable or sealed
11.9.1	Communications shall be provided at load or unloading locations	13.17	Portable flammable gas indicator shall be readily available
11.9.2	Transfer in darkness shall have lighting	13.18	Written operating & maint. procedures
12.1	**Fire Protection, Safety, and Security**	13.18.1 (1 thru 6)	**Basic operations requirements**
12.2	Fire Protection for all facilities	13.18.3 .1	Written manual emergency procedures
12.2.1	Extent determined by an evaluation of following 10 …(12.2.2)	13.18.4	Written maintenance procedure manual
12.3	**Emergency Shutdown Systems**		
12.3.1	Shall have ESD system(s) to isolate or shutdown source of LNG		
12.3.2	Duplication valves not required if exist		
12.3.6	Operating instructions shall be present		
12.3.7	Manual actuators located at least 50'		
12.4	**Fire and Leak Detection**		
12.4.1	Enclosed building shall be monitored		
12.4.1	Low temp or flammable gas detection		
12.4.3.1	Fire detectors shall activate an alarm		
12.5.1	Water supply and system shall be provided unless 12.2.1 unnecessary or impractical		
12.6.1	Portable or wheeled fire ext (min 20#)	**NFPA-30AChap 12 and 4.3.72** This chapter shall apply when LNG is dispensed as motor vehicle fuel along with Class I or Class II flammable liquids.	
12.8	**Personnel Safety**		
12.8.1	Protective clothing be available & accessible		
12.8.3	Written procedures protect employees		
12.8.4	3 portable gas indicators available		