DESFA LNG Terminal Revithoussa

DESFA LNG Terminal "Revithoussa" serves as the entering point of LNG at Hellenic Gas Transmission System (NGTS). At its facilities can be performed the process of:

a. Unloading of LNG vessels

b. Storage of LNG

c. Recovery of boil off gas from storage tanks

d. Vaporization of LNG and

e. Natural Gas export to the Hellenic gas transmission system

At Revithoussa Jetty can be unloaded one vessel each time. The unloading system consists of three liquid Z-3101A/B/C, one vapour return arm Z -3102 LNG and piping system transferring LNG to storage tanks. The maximum LNG unloading rate is **7.250** m^3 /h.

LNG is transferred and stored at a temperature of -160°C, at about atmospheric pressure. Three cryogenic storage tanks with useful capacity 225.000 m^3 accommodate the LNG temporarily, before its regasification and export to gas grid.

Stored LNG continuously evaporates physically producing boil off gas which is mainly a mixture of methane and nitrogen. Boil of gas produced from this physical vaporization should be always sending out from storage tanks and recovered. Recovering system consists of cryogenic reciprocated compressors and recondenser. Recondenser is a pressure drum with internal special design to reliquefy boil off gas from storage tanks in direct touch with LNG.

In each storage tanks are equipped with 4 in-tank low pressure pumps. There are twelve (12) in tank low pressure pumps J-3201 A/B/C/D/E/F/G/H/I/J/K/L in total. These LP pumps feed normally Recondenser, or alternatively at high vaporization rates directly the high pressure

pump system. Recondenser is also used as suction drum for the high pressure pumps J-3104 A/B, J-3102 A/B and J-3103 A/B.

High pressure LNG is sending to vaporizers. Vaporizers are cryogenic heat exchangers of two types Open Rack Vaporizers (ORVs) and Submerged Combustion Vaporizers (SCVs). There are four ORVs M-3101 A/B/C/D and four SCVs M-3102 A/B/C/D.

High pressure gas from vaporizers is sending with two submarine gas pipelines (2x24”), having length of 510m and 620m, to Agia Triada metering station which is the entry point to the NGTS.

L.N.G. Terminal Sendout Rates

1. Sustained Maximum Send out Rate (SMSR): 1.400 m^3 /h (365 days x 24 hours).

2. Minimum Send out Rate: 119 m^3 /h.

Main Equipment

Description	Tag No.	Capacity for	Operating Pressure
Low Pressure pumps	J3201A/B/C/D/E/F/G/H/I/J/K/L	**200** m^3 ΥΦΑ/h	12 barg
High Pressure pumps	J3104 A/B	**413** m^3 ΥΦΑ/h	82 barg
	J3102A/B	**220** m^3 ΥΦΑ/h	82 barg
	J3103A/B	**300** m^3 ΥΦΑ/h	82 barg
Open Rack Vaporizers (ORV)	M-3101 A/B	**125** m^3 ΥΦΑ/h	26 - 64 barg
	M-3101 C	**381** m^3 ΥΦΑ/h	26 - 64 barg
	M-3101 D	**464** m^3 ΥΦΑ/h	26 - 64 barg
Submerged Combustion Vaporizers (S.C.V.)	M-3102 A/B	**125** m^3 ΥΦΑ /h	26 - 64 barg
	M-3102 A/B	**190** m^3 ΥΦΑ /h	26 - 64 barg
Cryogenic Boil-Off Gas Compressors	V-3101 A/B/C	**4.800** Kg /h	7barg
Sea Water Pumps	J 4301A/B/S	**2.035** m^3 /h	6 barg
	J 4305 A/B/S	**5.682** m^3 /h	6 barg

Cogeneration Plant of Power & Heat

Cogeneration Plant of Power & Heat of high efficiency (>92%) has been operating since 2009, supplying the necessary power to LNG terminal.

The two (2) internal combustion, 16 cylinders-V form gas engines, are combined with two generators producing 6,5 MW of power at 6.000 volts each.

Each generator can work alone or together supplying total power for LNG terminal operation giving high reliability to vaporization process. In addition, each generator or both can be synchronized and parallelized to the national power grid.

In case of total power loss (total loss of grid also), the necessary electrical power to restart all the auxiliaries of the power plant provided by two auxiliary emergency Diesel Generators, 2MVA each, at 6.000 V. Power Plant and EDGs assure terminal's total independency of power supply.

In addition to power supply, heat recovered from the plant gives a high thermal energy benefit to terminal for vaporization of LNG. Heat recovery system from exhaust gases and cooling water of power plant provides of almost 13 MW of thermal energy to the LNG terminal.

The heat recovering system includes a semi-closed hot water circuit involving pumps, and heat exchangers. Hot water is transferred to the modified submerged combustion vaporizers (SCVs) for the regasification process of LNG.

LNG TERMINAL OVERVIEW