0 NON-TECHNICAL SUMMARY

0.1 General

The existing Liquefied Natural Gas terminal has been operating on the island of Revıthoussa since 2000. It is used for storage of transported LNG and its regasification so that it is released for consumption. The LNG installation of DESFA in Revıthoussa is designed to carry out the following procedures:

- LNG unloading from LNG ships
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- storage of LNG quantities
- reliquidation of gases generated by the natural evaporation of LNG in tanks
- pumping and gasification of LNG
- NG insertion into the National Natural Gas Transmission System (NNGTS)
- Inactivation, Gassing Up, Cooling and Partial Filling of LNG ship Cargo tanks

0.2 Upgrade of Jetty Facilities as part of the 2nd Upgrade of the LNG terminal

The projects of the upgrade of the jetty facilities, the extension of the send out rate of the Station as well as the construction of the 3rd Tank are developed as part of the 2nd upgrade of the LNG terminal of Revithoussa island, a project which is included in the planned Major Projects and the Priority Projects of Greece's energy sector, contributing to the integration of Greece into the international electricity and natural gas transmission networks.

The project of the 2nd Upgrade is considered paramount for Greece
The main purpose of the upgrade of the jetty facilities of the LNG terminal is:

1. The possibility of upgrading the marine facility of Revithoussa so that it serves (3) three categories of ships which transport liquefied natural gas (LNG), those of 180 000m^3, 220 000m^3 and 260 000 m^3.

Therefore, this possibility has been examined under the current circumstances so that the pier-platform of Revithoussa can serve the three most commercial categories of ships:

- Large Conventional -(150 000 –180 000 m^3)
- Q-Flex (between 200 000 – 220 000 m^3) and
- Q-Max.((>260,000 m3) It has LNG capacity from 266 000 m^3 (9 400 000 cu ft), equal to 161 994 000 cubic metres (5.7208 × 109 cu ft) of natural gas on the basis of the criteria of the draught and capacity

2. The examination of the available sea area in front of the quay wall with regard to maneuvers of ships and their unloading

The critical characteristic depth of the platform on the basis of the construction plans is **-13.42 m** from the **Lowest Low Water Level**.

According to the latest bathymetries this depth was found to be **-12.77 m**., due to the accumulation of sedimentary materials and stones.

On the basis of the above **ships with a deepest draught of 12.40 m**. can be served under the current circumstances provided that these materials will be removed and that the maximum depth of the sea bed in front of the platform is cleaned so that it returns to the **initial depth of -13.42m. This deepest draught may increase marginally to 12.50.**

In this case 87.64% of the existing LNG carrier ships, i.e. 305 of 348 ships, will be able to moor at the terminal, as well as ships with a marginal draught of 12.50 m., which represent 91.95%, namely 320 ships of the total 348.

The allocation of the ships depending on the displacement out of the corresponding total existing ships with a draught of 12.40 m. and 12.50m. is the following:

Table 0.1 Allocation of ships

Capacity of LNG Carriers in m^3	Number and Percentage on the Total LNG Carriers that can be served

Smaller or equal to 90 000 m^3	1 ship out of total 22 existing ships 4.5%
120 000m^3 to 149 999 m^3	14 ships, out of total 213 ships. 6.6%
150 000 m^3 to 180 000 m^3	14 ships out of total 70 ships. 20%
200 000 m^3 to 220 000 m^3	10 ships out of total 30 ships. 33.3%
Larger than 260 000 m^3	4 ships out of total 13 existing ships. 30.8%

Of the above 43 ships, 15 which have a larger displacement than 12.40 m and smaller than 12.50 m can be accommodated. Moreover, a reference is made below to the possible service of the other 28 ships with a larger displacement than 12.50 m.

Only 5 of the above ships have been constructed prior to 2 000 in the period 1969 to 1994 and older techniques have been used in their construction.

The following additional improvements should be made to the existing platform in order to achieve the mooring of ships with a Capacity of 220.000m^3 to 260 000m^3.

- Cleaning of the sea bed in front of the quay from the accumulated sediments and stones so that it is restored to its original depth, i.e. -13.42 m from the lowest low water level (L.L.W.L.), and the minimum required safety range from the ship's keel at the maximum draught with a load that amounts to 12.40m or 12.50 m respectively is achieved.
- Replacement of the existing Fenders with others which are new and capable of absorbing the design berthing energyduring the tying up of large tonnage ships (220 000 & 260 000m^3) for abnormal conditions.
- Supply and placement of two additional Mooring Hooks (one on each side) so as to ensure safe mooring conditions under abnormal conditions during the access of the above tonnages.
- Certification of the operation and effectiveness of all existing mooring lines through appropriate checks, of the existing automatic mooring hooks as well of the bases on which they are founded.
- Shielding of slopes for the placement of two new mooring points and stabilisation of the existing ones where required.

Through the above upgrading works which are scheduled to be executed in the port of the terminal, it will be possible for 90% of the ships of the LNG Carrier type to be served, namely from 305 to 320 ships out of 348 ships.

It should be stressed that the remaining 9% of the ships with a draught of more than 12.5 m can moor safely in the existing jetty facilities after the proposed upgrade through the cleaning works to a depth of 13.42 m., the replacement of fenders and the placement of two additional mooring points, provided that these ships reduce their draught during their approach or removal from the quay to 12.5 m regulating their ballast or approaching in a gradual manner.

0.3 Alternative solutions

Due to the nature, size and area of the project there are no alternative solutions as regards the

- placement of two additional Mooring Hooks (one on each side) so as to ensure safe mooring conditions under abnormal conditions during the access of the abovecapacities .
- shielding of slopes for the placement of two new mooring points and stabilisation of the existing ones where required.

Issues of replacement of equipment, certification of operation and cleaning of the sea bed constitute an imperative need for the safe mooring not only of the existing but also of the new ships with increased capacity .

The area where the mooring points will be placed will be at a specified distance for the purpose of the safe mooring of the ships. It will be located entirely within the existing area, whereas the layout requires *de facto* the installation of the respective equipment in the proposed position only.

It is obvious that any alternative solution in the specific project will cause environmental damage, since it would require extensive works.

The Liquefied Natural Gas installations on the island of Revithoussa are considered paramount for Greece, if not for Europe. The General Physical Planning and Sustainable Development Framework states in Article 6 ‘Spatial structure of critical infrastructure networks and transport services, energy and communications’, paragraph B.2 ‘Energy infrastructure’, sub-paragraph c, that the integration of energy infrastructures of strategic scope into the national physical planning imposes *inter alia*:

the 2nd upgrade of the Liquefied Natural Gas terminal on the Island of Revithoussa including the upgrade of the jetty facilities.