



**HELLENIC GAS
TRANSMISSION
SYSTEM OPERATOR**

357-359, MESSOGION AVE.,
15231 ATHENS, GREECE
Tel.: 210 6501258
Fax : 210 6501551

**TECHNICAL JOB
SPECIFICATION**

F4

REVISION 1

DATE 22/09/2011

LIQUEFIED NATURAL GAS PLANTS

**NITROGEN PURGING
REQUIREMENTS FOR LNG STORAGE
TANKS**

HELLENIC GAS TRANSMISSION SYSTEM OPERATOR



Job Spec. No F4
Revision 1
Date 22-09-2011
Page 2/6

QUALITY ASSURANCE PAGE

CHANGES LOG

- para 2.7 deleted

REVISIONS LOG

1	22-09-2011	DESFA COMMENTS	PQ DPT	VG
0	03-06-2011	FIRST ISSUE	PQ DPT	VG
Rev. No	Rev. Date	REASON FOR CHANGE	Made By	Approved By

CONTENTS

REFERENCE DOCUMENTS

- 1.0 GENERAL**
- 2.0 DESIGN REQUIREMENTS**

REFERENCE DOCUMENTS**ELOT EN 1473**

[Installations and Equipment for Liquefied Natural Gas. Design of onshore installations]

DESFA Job Spec. – OA2

[General specification for hydrocarbon gas detectors and receiver modules]

HELLENIC GAS TRANSMISSION SYSTEM OPERATOR



Job Spec. No F4
Revision 1
Date 22-09-2011
Page 5/6

1.0 GENERAL

1.1 This specification covers the requirements for an inert gas purging of the LNG Storage Tank, insulation and associated systems.

1.2 Each LNG Storage Tank shall be provided with the necessary purging systems to enable a Storage Tank:

- a) To be inerted.
- b) To be provided with the necessary in service purges.
- c) Once commissioned, to be safely decommissioned for repairs.

1.3 Nitrogen shall be used as the inert gas for tank purging and will be available from the terminal nitrogen distribution system.

1.4 The decommissioning shall be governed by the following principles:

- a. The purge media to be uniformly distributed.
- b. The tank should be self venting - no high point gas pockets are allowed to exist.
- c. The volumetric displacement rate shall be 1.0 tank volumes / day including annulus and below floor.
- d. It may be assumed the tank has been drained, or liquids have been removed before commencing the decommissioning procedure.
- e. The goal is to clear the tank for safe entry within 14 days of the time it is considered to be liquid free.

1 2.0 DESIGN REQUIREMENTS

2.1 The self supported type LNG Storage Tank shall be provided with a distributor pipe for the purposes of introducing purge gas into the annulus, the bottom of the tank and inerting the primary container.

For a membrane type LNG Storage Tank, a distributor system shall be provided for introducing purge gas into the insulation space between the membrane and the concrete, and for inerting the primary container.

2.2 Provision shall be made for purging the insulation spaces with inert gas. The purge system shall be provided by the Contractor in accordance with his proprietary design. Materials selected shall be compatible with the design metal temperature of the primary container.

HELLENIC GAS TRANSMISSION SYSTEM OPERATOR



Job Spec. No F4
Revision 1
Date 22-09-2011
Page 6/6

- 2.3 The tank base insulation layer shall be provided with means of purging out any residual vapor or liquid from each layer independently. Consideration shall be given to the possibility of overpressurising the insulation space with resulting uplift on the bottom plates. The Contractor shall provide the necessary inlet and outlet piping, pressuring reducing valves and relief valves. A hydrocarbon analyzer for installation on the common outlet shall be provided, with an analogue signal indicating methane level. Analyzer shall conform to the requirements of **DESFA Spec. OA-2** but shall be connected to the DCS.
- 2.4 All connections for the tank purging systems shall be through the roof. Shell and bottom penetrations shall be not be used.
- 2.5 The storage tank shall be provided with a high point vent connected to the flare system which will be used for venting purge gas from the roof vapor space.
- 2.6 Provision shall be made for each internal pump well to be purged with inert gas prior to pump removal and after pump installation.
- 2.7 Each pump well shall be provided with a high point vent connected to the flare system for venting purge gas from the pump well.
- 2.8 Provision shall be made for an inert gas purge to each electrical terminal box for motor cables and instrument cables.
- 2.9 Provision shall be made for an inert gas purge to all pump discharge and kickback lines.
- 2.10 Bypass valves shall be provided on at least one relief valve to atmosphere and one relief valve connected to the flare system for the purposes of venting purge gas from the primary container.
- 2.11 Non-return check valves shall be provided on all inert purge lines. Removal spool pieces shall be provided on all lines connected to pump discharge and kickback lines.
- 2.12 The purge system shall terminate at the battery limits of the tank with standard pipe connections and shall be connected to the main header of nitrogen supply.
- 2.13 A pressure measurement system shall be provided to measure the differential pressure across the bottom plates.
- 2.14 In case the insulation is directly in contact with the gas volume of the tank, provision shall be taken for purging and inerting this space (see para 6.12 **ELOT EN 1473**).