



**HELLENIC GAS  
TRANSMISSION  
SYSTEM OPERATOR**

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

**TECHNICAL JOB  
SPECIFICATION**

**OA-8**

**REVISION 1**

**DATE 22/09/2011**

**LIQUEFIED NATURAL GAS PLANTS**

**CRYOGENIC TANK LEVEL,  
TEMPERATURE AND DENSITY  
MONITORING SYSTEM**

**QUALITY ASSURANCE PAGE**

**CHANGES LOG**

- Changes in para 1.5

**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**
- 3.0 INSPECTION**

## REFERENCE DOCUMENTS

### **ELOT EN 1473**

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

### **ELOT EN 1759-1**

[Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, class designated. Steel flanges, NPS ½ to 24]

### **ELOT EN 60079-1**

[Electrical apparatus for explosive gas atmospheres- Part 1: Flameproof enclosures "d"]

### **ELOT EN 60079-25**

[Electrical apparatus for explosive gas atmospheres- Part 25: Intrinsically safe systems]

## **EU DIRECTIVES**

### **LVD 2006/95/EC**

[Harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits]

### **EMC 2004/108/EC**

[Approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC EMC]

### **ATEX 94/9/EC**

[Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres]

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## 1.0 GENERAL

1.1 This specification, together with the technical volume and data sheets, covers the requirements of materials, design testing, marking, and shipping of a combined continuous Level – Temperature – Density monitoring system, hereinafter referred to as "LTD Monitoring System".

1.2 The related standard referred to herein and shown below shall be of the latest edition prior to the date of purchaser's enquiry.

**ELOT EN 60079-1** "Electrical apparatus for explosive gas atmospheres- Part 1: Flameproof enclosures d".

1.3 LTD Monitoring system shall consist of:

- a) Field equipment.
- b) Remote control and display unit
- c) Interconnecting cables.

While the Vendors scope of supply includes items (a) and (b), interconnecting cables, item (c), will be supplied by others based on Vendor's recommended cable specifications to be submitted along with the quotation.

1.4 The approximate cable route length between the field equipment and remote control display unit is identified on the instrument data sheets.

1.5 Field equipment will be located in a hazardous area classified as Zone 1, GAS GROUP IIB, TEMPERATURE CLASS T3, in accordance with **ELOT EN 60079-1**. All field equipment shall, in addition to being suitable for the hazard area classification, be weatherproof. Equipment shall be certified by an approved authority and a **CERTIFICATE** shall be included by Vendor with his bid.

1.6 The remote control / display unit will be located inside an air conditioned control room classified as a "safe area".

1.7 Vendor shall highlight in his bid all deviations from this specification.

1.8 The remote display units will be located inside an air-conditioned Control room classified as a Non Hazardous area will be performed through a DCS inside the Central Control Room. (Non Hazardous air conditioned area).

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## 2.0 DESIGN

### 2.1 The LTD MONITORING SYSTEM shall comprise:

#### a) Field Mounted

2-sets of tank mounted probe assemblies (1-per Tank)

Each probe assembly will house:

- i. Liquid level sensors
- ii. Density sensor
- iii. Temperature sensor

Each probe assembly will include the necessary stepping motor, drive mechanism, helical drive cable, cable guides pinch valve, weight enclosure and probe enclosure.

The connection to the tank shall be by 250DN nozzle and 250DN butt weld/ ELOT EN 1759-1 class 150, phase type B (raised face) Flanged Ball Valve.

#### b) Control Room Equipment

2 Electronic Control Units (1-per tank), (adjustable settings for high/low temperature, density and level alarms should be included).

1 – Data acquisition system comprising:

- i. Microprocessor
- ii. V.D.U. Screen
- iii. Hard Copy Printer.

2.2 The microprocessor shall organize the continuous scanning requirements of the VDU screen and alarm logging of the printer. It shall also, on a pre-programmed time interval, (or when manually selected) raise / lower selected LTD probe assemblies to pre-determinate "exploration levels" and initiate readout of temperature / density and exploration level point.

2.3 The video screen will present the operator with an "over view" of all parameters being measured. Vendor is requested to illustrate and describe the information format proposed. Display should include:

- a) True level (in meters), temperature and density.
- b) Position of probe with respect to a reference level (exploration level).
- c) Temperature (in degrees Centigrade) at exploration level.
- d) Density (in kg/dm<sup>3</sup>) at exploration level.
- e) All alarms.

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- 2.4 The printer will automatically log all alarms as they occur and the following information will be printed.

Tank No.	Product	Temp Hi/Lo	Density Hi/Lo	Level Hi/Lo	Time
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Additionally, on demand, the status of tanks can be individually, or totally, called up.

- 2.5 The probe assembly shall be capable of being withdrawn from the tank for inspection and maintenance while the tank is under pressure and operating, via a pipe flange assembly which fits onto tank isolation ball valve.
- 2.6 Calibration facilities shall be provided for checking the level readings.  
Signal transmission from field mounted transmitters shall be certified, intrinsically safe for certification standard **ELOT EN 60079-25**.
- 2.7 However, any drive motor necessary for positioning the probe assembly may be explosion proof. Certification by a recognized authority may be submitted for consideration.
- 2.8 Repeat signals shall be available for interfacing the system with the DCS inside the control room. A 4-20ma signal representing corrected level and contact outputs for low and high level shall be provided.
- 2.9 All field equipment shall be powered from the remote control unit.
- 2.10 Electrical power supply available is 200V, 50 Hz.

2.11 **ACCURACY**

a)	Level measurement:	$\pm 2\text{mm}$
b)	Temperature measurement:	$\pm 0.1^{\circ}\text{C}$
c)	Density measurement:	$\pm 0.5 \text{ kg/m}^3$

3.0 **INSPECTION**

- 3.1 The equipment will be subject to inspection by the OWNER at Manufacturers Works on completion. Inspection will comprise a visual and functional simulated test. Manufacturer shall allocate adequate time, space facilities and assistance to permit OWNERS inspection and testing to the satisfaction of the inspector.