DESFA
Hellenic Gas Transmission System Operator

HELLENIC GAS TRANSMISSION SYSTEM OPERATOR

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TECHNICAL JOB SPECIFICATION
510/2
REVISION 0
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HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

PLUG VALVES DN ≥ 50

QUALITY ASSURANCE PAGE

CHANGES LOG

REVISIONS LNG

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CONTENTS

REFERENCE DOCUMENTS

Job Spec. No. 834/2
[Plant Coating of Buried Valves for Pipeline]

Job Spec. No. 970/2
[Shop inspection of equipment and materials for NOT project]

ELOT EN 1759-1 [Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, class-designated. Steel flanges, NPS 1/2 to 24

ELOT EN 1503-1
[Valves - Materials for bodies, bonnets and covers - Part 1: Steels specified in European standards]

ELOT EN 10045-1
[Charpy Impact test on metallic materials-part 1: test method]

ELOT EN 10204
[Inspection Documents for metallic products]

ELOT EN 13942 (ISO 14313 modified)
[Petroleum and natural gas industries - Pipeline transportation systems - Pipeline valves]

ELOT EN 14141
[Valves natural gas transportation in pipelines - Performance and tests]

ELOT EN ISO 10497
[Testing of valves – Fire type testing requirements]

ASME B16.5
[Pipe Flanges and Flanged Fittings]

1.0 SCOPE

1.1 ITEM

Plug valves DN ≥ 50, straightway.

1.2 SERVICE

Sweet, natural gas with sporadic passage of water and glycol.

1.3 APPLICATION

Shut-off

1.4 ADDITIONAL INFORMATION

Additional information may be given in the Data Sheets and Material Requisition and these documents should be read in conjunction with this Job Specification.

Any conflict between requirements of this Specification and drawings, Data Sheets and Material Requisition supplementary design data, or Standards shall be referred to Owner for clarification, before proceeding with fabrication of concerned part.

Plug valve Manufacturer shall be responsible to design valves and their components in accordance with the requirements of applicable documents.

In no event, however, are thicknesses, dimensions etc. to be less than those shown on valve drawings unless specific written approval to the contrary is received from Owner.

2.0 GENERAL REQUIREMENTS

2.1 APPLICABLE STANDARDS

ELOT EN 14141 and **ELOT EN 13942**, additionally satisfying the requirements herein.

2.2 UNITS

Metric for all units.

2.3 PRESSURE RATING

Refer to Data Sheet or Material Requisition.

2.4 PATTERN

Refer to Data Sheet for short, regular or venture pattern requirement.

2.5 CONSTRUCTION

2.5.1 PLUG

Tapered.

2.5.2 LUBRICATION

Required through lubricant check valve. Lubricant grooves shall disconnect lubricant chamber and pipe bore under plug movement. Any lubricants shall be suitable for the Minimum Winter Design Temperature in the location where they are to be installed.

Valves for use below ground shall have the injection line(s) extended to near valve operator. A check valve shall be mounted where the injection line is fixed to the body. Screwed joints are only acceptable if fully engaged and seal welded.

2.5.3 MECHANICAL ADJUSTMENT OF PLUG

Required by bottom screw.

2.5.4 STEM/PLUG CONNECTION

Design shall prevent lateral strain on stem for valves class PN 50 and higher (equaliser ring).

2.5.5 STEM SEALS

Dual O-rings or alternate design of equivalent or better quality.

Ingress of water between stem and gland shall be prevented (e.g. weather seal).

2.5.6 STEM STOPS

Required

2.5.7 WELDING ENDS

Shall match the diameters of the abutting ends within a tolerance of ± 1.6 mm. Refer to DATA SHEET for abutting pipe dimensions.

Beveling shall be as specified in **ELOT EN 14141.**

2.5.8 FLANGES

Raised Face or Ring Joint as per **ELOT EN 1759-1.** For flanges with DN>600 not covered by this standard, dimensions given in **ASME B16.5** applies. Refer to Data Sheet for type. Bore to be derived from abutting pipe dimensions, see Data Sheet.

2.5.9 VALVE OPERATION

Refer to Data Sheet for method.

2.5.10 LIFTING EYES

Required for valves DN > 150.

2.5.11 STEM EXTENSION HOUSING

Housing shall be rigidly mounted to valve body by flanges (or similar joint). Housing design and its connections to valve and gear operator shall prevent any ingress of water, humid air or other substances which may affect valve operation, particularly during cold periods. Where air tightness cannot be ensured, filling of the housing with a suitable lubricant can be considered acceptable.

2.5.12 SUPPORT RIBS AND LEGS

Refer to Data Sheet for requirement.

Where a support is required the size of the area actually transferring the load to a base below shall be at least 20 mm^2 per kilogram of valve weight.

2.6 MATERIALS

2.6.1 GENERAL

Only fully killed fine grain carbon steel conforming to European Standards **ELOT EN 14141** and **ELOT EN 1503-1** shall be used.

When normalized and tempered materials are specified, the tempering shall be performed prior to any welding unless specifically otherwise authorized in writing by the Owner. The tempering temperature shall be 10°C higher than that required for post weld Heat Treatment, unless otherwise specified. Attention is drawn to section 3 detailing certification requirements.

Body and cover shall have impact tests for each type of material used as per **ELOT EN 14141** and **ELOT EN 10045-1**. The test temperature shall be -20°C, unless a lower temperature is specified in the Data Sheet, with the following acceptance criterion: Mean value from the 3 tests 31 Joules or better, with the lowest single value 24 Joules. Mating seating surfaces shall have a hardness differential of at least 50 HB.

2.6.2 BODY (INCL. WELDING ENDS)

As per **ELOT EN 14141** and essential details are as follows:

- Carbon content C shall be ≤ 0.21% on heat analysis.
- Carbon equivalent (CEV)

  ≤0.45% for grades with SMYS ≤ 360 N/mm^2 and

  ≤0.48% for grades with SMYS > 360 N/mm^2.
- Body shall be normalized or normalized and tempered.

2.6.3 PLUG

Carbon steel (similar material to body).

2.6.4 COVER

ELOT EN 1503-1 grade P280GH/1.0426 or **P285NH/1.0477,** or **ELOT EN 1503-1 grade P275NH/1.0487** or **P355NH/1.0565,** or equivalent.

2.6.5 STEM SEALS
Suitable
elastomer.

2.7 NON DESTRUCTIVE EXAMINATION

All items shall be radiographically, ultrasonically or magnetic particle examined according to **ELOT EN 14141.**

2.8 FIRE TEST

If so specified on the data sheet valve design shall have been qualified as per **ELOT EN ISO 10497.**

"Fire-safe" certification shall include "fire-safe" tests representing all sizes and pressure ratings for each valve model. "Fire-safe" tests shall be witnessed by the Inspector. Previous acceptance of certification by the Owner is acceptable in lieu of requalification for identical valves.

2.9 FACTORY TEST

2.9.1 STRENGTH AND TIGHTNESS TEST

Air seat tests plus hydrostatic shell tests as per **ELOT EN 14141** are required.

2.9.2 OPERATIONAL TORQUE TEST

Required after mounting of operating equipment and inclusive of operator functions.

2.10 SURFACE TREATMENT

As per Data Sheet. Valves to be installed below ground shall be coated externally by Manufacturer. External coating for buried valves shall be in accordance with Job Spec. 834/2. Valves to be installed above ground shall be primed and painted.

2.11 MARKING

Valves to be installed below ground shall be marked on one welding end with valve serial number, Client contract number and material grade of welding end, and all marking shall be as per **ELOT EN 13942** (ISO 14313 modified) on the nameplate which shall be fixed at a point close to the actuator /operator.

Valves to be installed above ground shall be marked on their bodies with serial number and Client contract number. Welding ends shall be marked with material grade, and all marking shall be as per **ELOT EN 13942** (ISO 14313 modified) on the nameplate.

The nameplate shall additionally bear the Inspection Body stamp as per **ELOT EN 10204** and Job Specification **970/2.**

2.12 TAGGING

All valves shall be tagged with the valve number (commodity code) as stated on the data sheet and be prefixed by the valve nominal size. This shall be clearly stamped on a noncorrodible metal tag which is to be securely attached to the valve with a non- corrodible metal wire.

2.13 DELIVERY

When wrench is specified on the DATA SHEET, one piece shall be supplied with each valve.

Handle extension is required if valve is to be installed below ground.

Handwheels and wrenches may be shipped in accordance with the Manufacturer's standard procedure, otherwise the valve shall be delivered in fully assembled condition with all openings, pipe ends, nipples, etc. capped for protection.

3.0 TECHNICAL DOCUMENTATION. INSPECTION AND CERTIFICATION

3.1 QUANTITY

Four copies of each inclusive of original for all Documents and Certificates.
Four copies of each inclusive of one reproducible for all Drawings.

Also electronic files of all Documents and Certificates must be submitted by Contractor to the Owner.

3.2 INSPECTION AND CERTIFICATION

Inspection will be performed by an Independent Accredited Inspection Body or the Manufacturer's Authorized representative independent of the manufacturing department.

Inspection requirements are defined in the following documents.

a. Material Requisition

b. Job Specification **970/2** "Shop inspection of equipment and material for NGT Project".

c. Relevant project specifications.

d. Inspection clauses of Applicable Standards.
Inspection procedures to be followed are detailed in Owner document "Inspection and Test instructions".

3.3 DOCUMENT REQUIREMENTS

3.3.1 WITH TENDER

Proof of design either as certificates of approval or prototype test report issued by an Accredited certifying authority.

Statement of Manufacturer's type number for each item if standard product offered.

Catalogues, general arrangement drawings and parts list etc. covering all items inclusive of operating equipment.

Statement regarding materials used for all principle components with reference to material standards herein.

Statement regarding materials for surface treatment.

Certificate confirming valve design has been qualified for Fire Test Approval (para. 2.7), if required.

3.3.2 AFTER AWARD OF CONTRACT (BEFORE PRODUCTION)

Dimensioned General Arrangement drawing including support ribs, operating gear etc., together with component material parts list, detailing material standard and grade, item number and description as well as certification level of materials as a minimum.

Welding procedures specifications, Testing Procedures.

Recommended welding procedure for installation in pipeline to avoid excessive heat on valve.

Manufacturer's Detailed Test and Inspection plan. The plan should additionally show the control points at which the independent inspector's witnessing /approval is required, as per section 3.2 herein.

3.3.3 ON DELIVERY

Comprehensive operation, maintenance and reconditioning manuals.

List of recommended tools, spare parts, lubricants etc, necessary for two years operation.

3.4 VALVE CERTIFICATION PACKAGE.

Valve drawings shall include the following information printed clearly in, or adjacent to the title block:

a) Contract No.

b) Requisition No. and Item No.

c) Purchase Order No.

d) Valve number (commodity Code)

e) The principal dimensions of the valve, any gear operator, the size, type and style. The weight of the valve, per size, should also be included.

f) Materials of construction

g) Pressure-Temperature limitations.

Drawings shall be checked and certified by the Manufacturer as being an actual record of the valve being supplied against the Purchase Order.

Drawings shall be sent to Owner accompanied by a transmittal note or letter marked for attention Procurement Department.

Owner's approval of Manufacturer's drawings shall not be considered as relieving the Manufacturer of any responsibility for detailed design, dimensions and construction of equipment or deviation from specification.

Manufacturer shall not commence final manufacture of valves until receipt by Owner approval of his drawings.

4.0 SHIPMENT. PROTECTIVE COATING AND END PROTECTION

- Valves shall be shipped in the open position.
- Unmachined exterior surfaces of valves shall be painted as per Manufacturer's standard.
- Machined or threaded surfaces subject to atmospheric corrosion during shipment or subsequent storage shall be coated with easily removable rust preventive.
- Valves with screwed or socket weld parts shall have the ends protected with metal, or plastic plugs.
- Valves with flanged ends shall have the gasket surface protected by means of a suitable disc wired on.
- Valves with butt-weld ends shall have the bevels covered with a suitable close fitting protector.
- When lifting the valves, the slingers must be wrapped around the body only and not around the spindle lever.
- Packing is to be in wood cases.
- The valves to be transported must be firmly fixed to the case load-bearing bottom.
- For valves with a weight greater than 0.6 tons fastening is performed with wooden saddles and joists nailed to the side walls. The saddles two for each valve, must ensure an uniform distribution of the valve weight over the case

bottom. For valves with a weight lighter than 0.6 tons only the joists nailed to the side walls are required. For the valve actuator units and the valve components (e.g. extensions) the fastening will depend upon their shape, weight and dimensions.

- The packing shall be mechanically protected i.e. from impact caused by falls during handling, vibration caused by transport etc.
- Manufacturer's Quality Plan shall include details about lifting, support during transportation, preservation, etc.