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TRANSMISSION
SYSTEM OPERATOR**

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**TECHNICAL JOB
SPECIFICATION**

600/1

REVISION 0

DATE 05/04/2011

HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

GENERAL NOTES FOR INSTRUMENTS

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QUALITY ASSURANCE PAGE

CHANGES LOG

REVISIONS LOG

0	05-04-2011	FIRST ISSUE	PQ DPT.	V.G.
Rev. No	Rev. Date	REASON FOR CHANGE	Made By	Approved By

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REFERENCE DOCUMENTS

Job Spec. No. 100/1
[Welding Requirements for Equipment and Piping]

Job Spec. No. 900/3
[Material Color Coding]

Job Spec. No. 900/4
[Positive Material Identification]

Job Spec. No. 970/2
[Shop Inspection of Equipment and Materials for NGT Project]

Job Spec. No. 970/3
[Inspection and Test Instructions]

EU DIRECTIVE 94/9/EC ATEX
[Equipment Explosive Atmospheres Directive]

EU DIRECTIVE 97/23/EC PED
[Pressure Equipment Directive]

EU DIRECTIVE 2004/108/EEC EMC
[Electromagnetic Compatibility Directive]

EU DIRECTIVE 2006/95/EEC LVD
[Low Voltage Directive]

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1.0 **SCOPE**

This Job Specification covers the general requirements for the supply of drawings, engineering data and testing of instruments.

If exceptions, variations or additions are required in individual cases, they will be indicated in the Material Requisition.

2.0 **CORRESPONDENCE**

All correspondence and drawing transmittals shall be via air mail unless otherwise approved by Owner.

All correspondence shall be forwarded in duplicate and addressed to: (example)

Hellenic Gas Transmission System Operator S.A. (DESFA)
357-359 Messogion Avenue
GR 15231, Athens - Greece

Attention: -----

After order placement, preliminary and final documentation (drawings, manuals, certificates, data bases) shall be addressed in the requested number of copies according to schedule to: (example)

Hellenic Gas Transmission System Operator S.A. (DESFA)
357-359 Messogion Avenue
GR 15231, Athens - Greece

Attention: -----

3.0 **LANGUAGE AND UNITS**

All correspondence shall be in the English language.

All drawings, instruction books and any other written information shall be in English, except for official documents to be approved by local Authorities which shall be in Greek or in Greek/English (bilingual).

Metric system shall be used.

The complete list of measuring units is in **Attachment 2**.

4.0 **CERTIFICATES FOR ELECTRICAL EQUIPMENT**

All electrical equipment shall comply with the requirements of the latest edition of IEC/CENELEC recommendations and standards and must be supplied with suitable certification according to the requirements of applicable EU Directives, indicating the standard applied for the specific application according to the area classification. These certificates shall be approved by a Notified Body if required by the applicable EU Directives.

Each electrical equipment shall be provided with proper tag indicating the construction type as well as the protection class according to IEC/CENELEC rules.

For the intrinsically safe equipment the Manufacturer/Vendor has to include relevant certificates with details of relevant electric data (impedance, inductance, capacitance etc.) for each equipment.

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The calibration certificates (where applicable) of supplied instruments, shall be comprehensive of indications relevant to the equipment and adopted during the calibration and relevant references to the metrological chain.

All electrical equipment/systems shall conform to the European Directives as applicable:

- **94/9/EC ATEX**
- **2004/108/EEC EMC**
- **2006/95/EEC LVD**

and shall bear the CE MARK and declaration of conformity to the above EU Directives is also necessary according to requirements of the said EU Directives.

5.0 **DRAWINGS**

Drawings shall depict all equipment to be furnished according to the Contract, unless otherwise specified in the requisition.

Drawings, diagrams, bills of materials, manuals, catalogs, etc, including those of Sub-Suppliers shall be identified with the following information located in or adjacent to the title frame. Vendor/Manufacturer will be requested to resubmit documents tendered without this information.

CLIENT	Owner
PIPELINE	
LOCATION	
CONTRACT	
REQ. No.	
DWG No.	
P.O. No.	
ITEM No.	
UNIT No.	
MANUFACTURER	
REF. No.	

The Vendor/Manufacturer shall fill in all blanks of the table above, using information from the relevant Material Requisition and Purchase Order.

Vendors/Manufacturers shall furnish an index of all the drawings that shall be produced.

The preliminary index shall be attached to the offer, the final index shall be submitted within two weeks from order placement.

Such index shall be prepared by filling the relevant data in the "SUPPLIER DOCUMENT INDEX" as per **Attachment 3**.

Documentation for each contract must be separated and properly identified. Certified prints, or manuals and catalogs, shall not be valid for more than one individual contract number.

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The Vendor's/Manufacturer's certified outline drawings shall include weights and adequate dimensioning details to give PURCHASER necessary information for the design calculations and drawings of foundations, piping and wiring connections, disassembly clearances and facilities, etc, for a proper installation.

Any weights significant to maintenance operations shall be noted on the drawings. Refer to the specific Material Requisition for additional documentation requirements.

The Vendor/Manufacturer shall furnish certified drawings, diagrams, and bills of materials as required, to describe completely all auxiliary systems supplied by the Vendor/Manufacturer.

These shall include control systems, panels, other auxiliary equipment or systems, etc. Data shall include utility requirements, electrical loads, etc. With reference to the electrical loads, the Vendor/Manufacturer shall in particular furnish all information as per **Attachment 1** (where applicable).

The Vendor/Manufacturer shall supply performance (and other) data in sufficient detail to enable PURCHASER to adequately design related processes, controls, electrical systems, utility systems, protective systems, alarm circuitry, etc.

The Vendor/Manufacturer drawings shall be checked, approved and signed by the Vendor before they are sent to Owner.

Any "PRELIMINARY" or "FOR REFERENCE ONLY" drawings shall be marked so, clearly.

The Vendor/Manufacturer shall assume full responsibility for the accuracy of all of his drawings. Where arrangement drawings, specifications, data sheets, etc. are provided, the material furnished must conform to the requirements set forth in all details; any deviation from these details shall be promptly brought to the attention of Owner.

Owner will return one print of each drawing marked "APPROVED" or "APPROVED AS NOTED". Approval made by the Client does not in any way relieve the Vendor/Manufacturer of full responsibility for the accuracy of his drawings, design, dimensions or full compliance with the Material Requisition, Specifications, etc.

All prints of drawings must be folded to a size of A4 (279x210 mm). Reproducibles shall not be folded but rolled.

All drawings shall be developed by use of software tools (AutoCAD) and the relevant electronic files shall be submitted to Owner.

All electronic files of all Documents and Certificates (word documents and/or AutoCAD documents as applicable) shall be submitted to Owner.

One (1) complete set of drawings and installation, operating and maintenance instructions shall be attached to the equipment in a suitable waterproof container shall be submitted to Owner. This is in addition to the data specified.

The Vendor/Manufacturer is requested to provide Owner with a complete Database covering the dimensions of the supplied IN-LINE INSTRUMENTS. Refer to the instructions on Attachment 4.

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6.0 MATERIAL CONTROL

It is the Vendor's/Manufacturer's responsibility to assure that all materials comply with the requirements of the relevant Specifications as detailed on the Material Requisition. The Vendor/Manufacturer shall not make any substitutions without the prior written approval of the Owner. Any such approval, however, will in no way relieve the Vendor/Manufacturer of full responsibility of the adequacy of all materials provided.

The Vendor/Manufacturer shall maintain suitable control of the material used and shall keep a record of the certified chemical and physical proper titles. Owner reserves the right to examine and request copies of these records.

7.0 RELEASE FOR FABRICATION

Unless otherwise specifically ordered in writing, material procurement and fabrication shall not be withheld pending Owner's approval of Vendor's/Manufacturer's drawings and welding procedures. Fabrication shall proceed immediately upon receipt of the order.

8.0 DESIGN MODIFICATIONS

When modifications are made to the equipment after the original order has been placed, the Vendor/Manufacturer must immediately price such changes and submit his claims for approval to the Owner for extra or credit allowance as the case may be.

9.0 ADHERENCE TO SPECIFICATION

Whenever equipment model number or numbers contradict the written description or the technical data on the Material Requisition, the last shall prevail.

10.0 EQUIPMENT IDENTIFICATION

Each piece of equipment shall be metal tagged with the equipment tag number and any other data specifically requested in the Material Requisition. The tag shall be of weather and corrosion resistant metal and shall be permanently affixed to the equipment. Where Material Requisition calls for the tag number to be stamped on the equipment, the metal tag need not to be furnished.

11.0 DEVIATIONS

All equipment and material shall be in accordance strictly with the specific requirements. If the Vendor/Manufacturer cannot comply with the requirements in any way, he shall clearly state in his quotations those items which do not comply and list any deviation.

12.0 WELDING

Where applicable, weldings shall be in accordance with **Job Spec. No. 100/1** (Welding Requirements for Equipment and Piping).

13.0 POSITIVE MATERIAL IDENTIFICATION (PMI)

Alloy materials shall be submitted to PMI test and the relevant certificates shall be produced. For details, refer to **Job Spec. No. 900/3** (Material Color Coding) and **900/4** (Positive Material Identification).

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14.0 **INSPECTION AND TESTING**

The material may be subjected to inspection, both during manufacture and before shipment, according to **Job Spec. No. 970/2** (Shop Inspection of Equipment and Materials for NGT Project) and **Job Spec. No. 970/3** (Inspection and Test Instructions).

15.0 **REGULATIONS**

The Vendor/Manufacturer shall ensure that all equipment and materials conform to all applicable EU Directives, the Greek regulations and legislation, and shall obtain approval of local or national Authorities as required, or shall apply any specific requirements on the Material Requisition or Purchaser Order.

16.0 **CERTIFICATIONS**

It is the Vendor's/Manufacturer's responsibility to ensure that all materials used in the manufacture of equipment comply with the requirements of the relevant specification as detailed on the Material Requisition and the EU Directives are fulfilled bearing the required marking. The Vendor/Manufacturer must maintain a suitable control of the materials used and keep a record of their certified chemical and mechanical properties. Owner reserves the right through their representative, to examine those records. In the case of alloy components this condition is mandatory.

17.0 **COMPLIANCE WITH THE EU DIRECTIVES**

Instrumentation that complies with the "New Approach" directives shall be provided with:

- a. A physical CE marking and other information as required by the relevant directives.
- b. A declaration of conformity which lists all the directives with which the product complies.
- c. Any other information specified by the individual Directive or the Directives under which the product falls, e.g. user instructions.

SCHEDULE OF DOCUMENTATION REQUIREMENTS

ITEM	WHETHER REQUIRED	NO. OF COPIES	WHEN DUE	REMARKS
Quotations	Yes	See inquiry	See inquiry	It is essential that quotations shall include sufficient description to provide a thorough understanding of the equipment offered and shall be accompanied by main dimensions and weights of major items of equipment and details of the permissible nozzle loadings, detailed information of utility requirements, installation and operating instructions. For major items of equipment needing foundations or inline mounted equipment, the weight & mounting method & dimensions must be given.
DRAWINGS 1st issue Certified for Comments	Yes	According to QA Plan	Two weeks after order	
DRAWINGS Final construction Issue	Yes	According to QAPlan	Two weeks after Client's approval / four weeks after order	Construction issue drawings are final issue drawings incorporating all comments on "first issue "(and possibly Certified for Approval) drgs. Drawings shall be signed by a responsible person to confirm that the drgs. are certified in all details. The details shown must be exactly in accordance with the equipment supplied.

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ITEM	WHETHER REQUIRED	NO. OF COPIES	WHEN DUE	REMARKS
SPARE PARTS LIST	Yes	According to QAPIan	See Inquiry	Manufacturer shall include with his tender a separate quotation for the necessary spare parts for start-up and for two years operation. Spare parts for start-up and for two years operation. Spare parts shall comply with all requirements for the main equipment requisitioned. In addition to these requirements the Vendor shall include the equipment identification for which the part is intended and reference number
PHYSICAL CHEMICAL & HYDROSTATIC CERTIFICATES	Yes	According to QAPIan	Immediately following inspection	Test Certificates shall refer to all shop tests. Perform performance tests and curves, heat runs etc, as applicable.
SAFETY CERTIFICATES (safety valves, rupture discs, etc)	Yes	According to QAPIan	Immediately following release	To Owner's Inspection Coordination

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ITEM	WHETHER REQUIRED	NO. OF COPIES	WHEN DUE	REMARKS
MECHANICAL CATALOGUE INFORMATION	Yes	According to QAPlan	Ten weeks after order	Manufacturer is to combine all orders on this contract into one group and furnish consolidated sets of literature. Information should include: installation and operating Instructions maintenance instructions Including sectional drgs. and part lists. test certificates as above technical description of equipment and circuits to describe operation if necessary data on components supplied by Manufacturer if applicable. Manufacturer shall be responsible without extra charge to the Owner to replace books damaged during transit order No. Req. No. & item No. to be shown on the front cover.

R = Reproducible (where applicable and only for formats > A3).

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ATTACHMENT 1**LISTING OF POWER CONSUMPTION**

A detailed list with all of the System power users and corresponding thermal loads with the indication of:

1. Type of electric load (resistive/capacitive/inductive).
2. Load characteristics:
 - Voltage (% +/-)
 - Frequency (% +/-)
 - Rated power [VA]
 - RMS current [A]
 - Peak current [A]
 - Inrush cur./dur. [A/sec.]
 - Crest factor
 - Power factor
3. Type of internal distribution: common protective device for more loads or one protective device for each load.
4. Type and manufacturer of protective devices:
 - Miniature automatic switch with thermal/magnetic release
 - Miniature automatic switch with magnetic release only
 - Fuse plugs on loads switch
5. Protection device data:
 - Nominal current [A]
 - Thermal current [A]
 - Range settings [A]
 - Tripping characteristics
 - Fuse melting curve
6. Grounding requirements:
 - Safety ground
 - Instrument reference ground

Where applicable, the above mentioned values have to be specified, even if preliminary, in the proposal.

ATTACHMENT 2
METRIC UNITS

The following metric units shall be used for the Project.

Length	millimeters, meters	mm, m
Area	square meters	m ²
Volume	cubic meters	m ³
	(gases) normal cubic meters measured at 0 °C dry at 1 atm (a) pressure	Nm ³
Flow Rate	cubic meter per hour	m ³ /h
	kilograms per hour	kg/h
	tons (metric) per hour	t/h
	normal cubic meters per hour	Nm ³ /h
Weight	kilogram, tons (metric)	kg, t
Plant capacity	tons per hour	t/h
	tons per year	t/Y
Temperature	degrees centigrade	°C
Heat	kilo-cal	kcal
Heat Content	kilo-cal per kilogram	kcal/kg
Heat Flow	kilo-cal per square meter per hour	kcal/m ² /h

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ATTACHMENT 2 (cont.)

Heat transfer	kilo-cal per hr, square meter, degree centigrade	kcal/h m ² °C
Density	kilograms per cubic meter	kg/m ³
Viscosity (dynamic)	centi poises	cP
Viscosity (kinematic)	centistokes	cS
Concentration	part per million	ppm
Velocity	meters/second	m/s
Electrical Power	kilowatts, megawatts	KW, MW
Current	ampere	A
Voltage	volt, kilo-volt	V, kV
Frequency	cycles/sec	Hz
Pressure (1)	bar absolute bar gauge	bar(a) bar(g)
Vacuum	millimeters of water millimeters of mercury mmHg	mmWC
Vibration	millimeters per second	mm/s
Pipe and Flanges		
- Size	millimeters	mm
- Rating	in accordance with EN Standards	

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ATTACHMENT 2 (cont.)

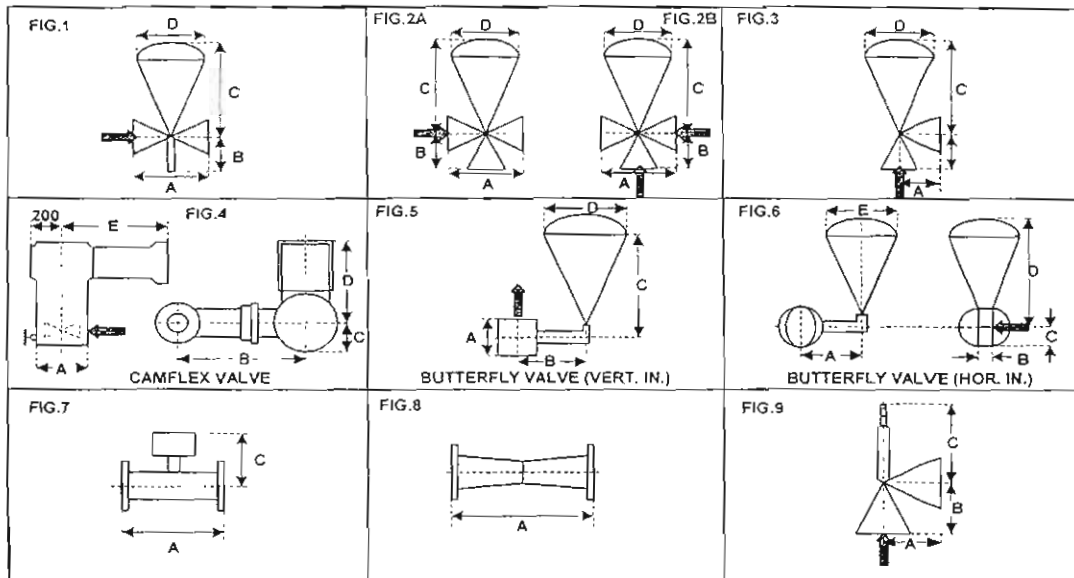
Note (1) : All engineering documents (specifications, flow diagrams etc.) shall report relative pressure, bar.

Note (2) : Multiples of units shall be as follows:

<u>Multiple</u>	<u>Symbol</u>
10^3	k(kilo)
10^6	M (mega)
10^9	G (giga)
10^{12}	T(tera)
10^{-3}	m(milli)
10^{-6}	M (micro)
10^{-9}	n (nano)
10^{-12}	P(pico)

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ATTACHMENT 4



The Manufacturer/Vendor is requested to provide Owner with a complete Database covering the dimensions of the supplied IN LINE INSTRUMENTS.

The Manufacturer/Vendor is fully responsible for the completeness and correctness of the supplied dimensional information.

The Manufacturer/Vendor shall provide the requested Database within 15 days from the P.O. date. The Database shall include the following data, as minimum:

	Notes	Example		Notes	Example
1. TAG NUMBER	(1)	PCV-1033	8. SIZE IN	(4)	
2. FIG No	(2)	1	9. RATING IN	(5)	300
3. A DIM	(3)	317	10. FACING IN	(6)	RF
4. B DIM	(3)	111	11. SIZE OUT	(4)	2
5. C DIM	(3)	523	12. RATING OUT	(5)	300
6. D DIM	(3)	383	13. FACING OUT	(6)	RF
7. E DIM	(3)				

Note (1) : To be sourced from instrument material requisition.

Note (2) : Specify the applicable figure number.

Note (3) : Dimension in mm.

Note (4) : Flange rating in inches.

Note (5) : Flange rating in LBS.

Note (6) : Flange facing (RR-FF-RTJ).