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HELLENIC GAS TRANSMISSION SYSTEM OPERATOR

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TECHNICAL JOB SPECIFICATION

247/1

REVISION 0

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HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

BOILERS

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REFERENCE DOCUMENTS

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European Community Directive 97/23/EC "of the European Parliament and of the Council of 29 May 1997 on the approximation of the laws of the Member States Concerning pressure equipment" **(PED).**

Job Spec. No. 246/1
[Burners]

Β.Δ. 277/63 (ΦΕΚ 65Α/1963) «περί ατμολεβήτων, εγκαταστάσεως και λειτουργίας αυτών»,

ELOT EN 10216-2
[Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 2: Non alloy and alloy steel tubes with specified elevated temperature properties]

ELOT EN 1561
[Founding - Grey cast irons]

ELOT EN 12952-8
[Water-tube boilers and auxiliary installations - Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler]

ELOT EN 13445
[Unfired pressure vessel]

ELOT EN 1092
[Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated]

ELOT EN 10028
[Flat products made of steel for pressure purposes]

1.0 SCOPE

This specification specifies boilers which are intended to be used as equipment of Process Unit.

2.0 STANDARDS

Boilers covered by this specification shall fulfill the requirements of the following:

- Pressure Equipment Directive **(PED) 97/23/EC.**
- This Specification.
- Documents to which reference is made in this specification.
- Greek regulations as described in **Β.Δ. 277 Φ.Ε.Κ 65Α/22-5-1963.**
- **ELOT EN 12952-8**
- **ELOT EN 13445**

Note: The selected boiler can be in accordance with Manufacturer Catalogue, provided that the domestic boiler is suitable for the intended service and in accordance with the above codes.

3.0 REFERENCES

The following specification forms an integral part of this specification: **Job Spec. No. 246/1.**

4.0 MATERIALS

Steel plate boilers as well as cast iron boilers may be used.

The materials shall be of an approved grade (e.g. steel plates according to **ELOT EN 10028**).

Tube material will be as per **ELOT EN 10216-2** (Materials P235GH and P265GH).

Cast iron shall at least fulfill the requirements laid down in **ELOT EN 1561**.

5.0 TECHNICAL REQUIREMENTS

The boilers shall be of a type suitable for natural or forced draft gas burners and natural gas.

The boiler shall preferably be of the three pass type.

The requirements to greater boiler systems of the closed type with safety relief valves shall be fulfilled i.e. the boilers shall be equipped with:

- a water temperature control device
- an overheat shut-off device (max. permissible water temperature is 110 °C)
- a low water level safety device
- an alarm system connected to above-mentioned safety device
- each boiler shall be fitted with at least two (2) safety relief valves

In addition the boiler shall be fitted with a thermometer and a pressure gauge connected to the water circuit and a thermometer for measuring the flue gas temperature.

The water temperature control device shall enable adjustment of the outlet water temperature at least between 65 °C and 95 °C.

The boiler shall be equipped with a high-low thermostat for controlling the two stage gas burner on step 1 or step 2.

The temperature difference between the water thermostats make and break points shall not be higher than 4 °C.

To minimize the heat losses the boiler shall be insulated.

At the burner rating stated the boiler efficiency shall be at least 0.87. The exhaust gas temperature shall never be lower than 90 °C.

The boiler efficiency shall be at least 0.84 with a load corresponding to 35% of the nominal useful output.

Boiler fluid will be a mixture of water and triethylene glycol (60%/40% by weight) added 1% inhibitor, (DODIGEN).

The boilers shall be suitable for operation/installation under the following conditions:

- max. operating pressure Pg = 3.5 bar (gauge) at a maximum temperature of 110 °C.
- boiler outlet temperature 90 Deg C.
- design temperature difference between water glycol mixture outlet and return will be 20 Deg C.
- flange connections for water inlet and outlet according to **ELOT EN 1092**.
- flue gas ducting preferably 300 mm.

The required heat capacity of each boiler shall be, of the above mentioned conditions as shown in the relevant boiler Process spec, depending on the M/R station category in question. Actual capacity will be specified. Boilers should preferably be designed such that later extension of capacity is possible.

The boiler shall be designed to avoid any disturbing noise caused by local overheating or insufficient water circulations, and to minimize the fire box pressure.

6.0 QUALITY CONTROL

6.1 FACTORY TEST

At the factory, the boilers shall be tested according to the requirements given by Standards and Greek regulation mentioned in **para 2.0**

At all times during which work on the order is being carried out, the purchaser or his representative shall have free access to those parts of the Manufacturer's premises which concern the manufacture and testing of the items ordered. The Manufacturer shall, without charge, provide the Purchaser or his Representative with all reasonable facilities necessary to satisfy him that the product is being produced in compliance with his specification.

6.2 STATION COMMISSIONING

Owner reserves the right to reject a boiler if the outcome of the station commissioning reveals that the requirements of this specification are not satisfied.

7.0 DOCUMENTATION

All documentation shall be in metric units and shall be in English and/or Greek. The following documentation shall be provided at the times indicated:

7.1 WITH THE TENDER

- sketches indicating dimensions, location and sizes of outlets, etc,
- assembly drawings showing internal design,
- calculations necessary for the evaluation of the design,
- list of materials,
- overall weight (with and without water),
- manufacturing schedule and
- list of consumable spare parts.

7.2 AFTER ENTRY INTO CONTRACT

At the latest three weeks after entering into the supply contract:

- detailed drawings indicating all dimensions, locations of outlets, etc,
- list of materials and certifying authorities,
- test specification and
- name plate text.

This material shall be forwarded in three sets, one of which will be returned following approval by the Purchaser.

This approval shall be obtained by the Vendor and a copy of the approved material shall be forwarded to the Purchaser.

7.3 ON DELIVERY

At the latest four weeks after delivery:

- technical information,
- as-built drawings,
- all necessary test and approval certificates,
- list of consumable spare parts,
- list of all spare parts,
- drawing showing spare part numbering,
- commissioning manual,
- operation manual
- servicing manual

8.0 SPARE PARTS

It's a minimum two (2) spare gaskets plus 10% bolts and nuts (minimum two) shall be supplied with the delivery.

9.0 DELIVERY

The delivery is not considered fulfilled until all the items and the associated documentation and certificates are received.

One piece boiler shall be furnished.

All outlets shall be capped and all flange faces shall be protected against corrosion and damaging.

Where necessary boiler and its components shall be supported by temporary and erection stiffeners to avoid distention and damage during transportation stiffeners to avoid distention and damage during transportation and erection.