



NATIONAL PETROCHEMICAL COMPANY
STANDARDS

MATERIAL STANDARD
FOR
SPECIAL-PURPOSE STEAM TURBINES
FOR REFINERY SERVICES
NPCS-MS-RE-14
REVISION : 0

DECEMBER 1992

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1 GENERAL

- 1.1 Special purpose steam turbines shall be supplied in accordance with the following:
API 612, Third Edition, November 1987, "special Purpose Steam Turbines for Refinery Service".
- 1.2 This standard is supplemented by the data sheets for each individual item on which the operating conditions and special requirements are listed. Wherever the data sheets conflict with the provisions of this standards, the data sheets shall govern. In the event that there are any exceptions to specifications, data sheets, codes, standards, etc., these shall be clearly listed in vendor's bid.
- 1.3 Compliance by the manufacturer with the provisions of this standard does not relieve him of his responsibility of furnishing equipment and accessories of proper design mechanically suited to meet the specified service conditions.
- 1.4 Unproven, prototype or "first-off" equipment is not acceptable; only proven equipment may be used. Proven equipment is defined as equipment that has been in continuous operation elsewhere for a minimum of two years without major breakdowns, on similar duties, and under similar conditions. In this context, "similar" does not mean absolutely identical. However, turbine casings of given sizes and pressure ratings must have been operated at powers and speeds of the same order of magnitude on the application under consideration. Vendor is to provide an experience list with the bid.

2 MODIFICATIONS TO API 612

The following paragraphs specifying the modifications follow the API 612 numbers and each paragraph denotes an addition, substitution or deletion.

(Substitution)

The API Standard clause is deleted and replaced by the new clause.



(Deletion)

The API Standard clause is deleted without any replacement.

(Addition1

A new clause with a new number is added.

(Modification)

Part of the API Standard clause is modified, and/or a new description and/or condition is added to that clause.

3 SECTION 1 - GENERAL

1.1 SCOPE

(Substitution)

This standard covers the minimum requirements for special purpose steam turbines used in process service.

1.2 ALTERNATIVE DESIGN

1.2.1 (Addition1

Metric fasteners and flanges constitute alternative design features and must be cited as an exception in the proposal.

1.2.2 (Addition)

Where reference is made in this standard to AISI or ASTM materials, alternative equivalent materials are acceptable. Where alternates are offered in place of AISI, ASTM or ASME, they shall be of similar or higher quality and design. Chemical composition and properties shall be checked to ensure suitability for the intended service. All materials will be subject of approval by purchaser. Where pressure vessels as defined by the ASME Code are included, they shall be designed and manufactured in accordance with section VIII and IX.



1.3 CONFLICTING, REQUIREMENTS

1.3.1 [Substitution)

In case of conflict between the various documents, their order precedence is as follows:

- Purchase order.
- Requisition.
- Data sheets.
- Project specification(s).
- This standard.
- Referenced industry standards.

1.3.2 (Addition)

All conflicting requirements shall be referred to the purchaser in writing. The purchaser will issue confirming documentation, if needed for clarification.

1.4 DEFINITION OF TERMS

1.4.24 (Addition)

"Unit responsibility" refers also to the technical responsibility for coordinating all auxiliary systems included in the scope of the order. This includes expediting, and assurance that all applicable specifications referenced on the data sheets or requisition are complied with by any sub-vendor. It also includes guarantee of performance of the complete package furnished.

1.4.25 (Addition1)

"Licenses" shall refer to equipment manufactured under license and all such equipment shall carry the licensor's written guarantee. The vendor's reference installation list shall indicate those machines built at the proposed point of manufacture.

1.4.26 (Addition)

Agreement shall be obtained in writing from the company before work may be sub-contracted. Vendor shall inspect, coordinate and resolve any problems related to his sub-vendor.

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4 **SECTION 2 - BASIC DESIGN**

2.1 GENERAL

2.1.1 **(Modification)**

Vendor shall assume responsibility for the engineering coordination of the equipment and all auxiliaries/systems included in the scope of supply.

2.1.4 **(Substitution)**

Equipment shall be designed to run without damage up to the trip speed and relief valve settings including accumulations.

2.1.5 **(Modification)**

The combine performance of the turbine and its driven equipment after installation shall be the responsibility of the vendor who has been nominated as being responsible for the complete unit.

2.1.10 **(Modification)**

Cooling water systems shall be designed for the above conditions except where more stringent requirements are specified in the utilities specification.

2.1.11 **(Substitution)**

The equipment shall conform to the project noise specification, and the maximum permissible sound level shall not exceed 85 dBA measured at 1 m from turbine surface for the recommended range of operation.

2.1.12 **(Substitution)**

Motors, electrical components, and electrical installations shall be suitable for the area classification (zone, group and T class) which will be specified in the project electrical and instrumentation specifications.

2.1.13 **(Modification)**

Turbines shall be suitable for continuous outdoor operation in the climatic zone which will be specified.



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2.2 PRESSURE CASINGS

2.2.9 (Modification)

Turbine drains shall be provided with isolation valves and shall be brought out to the edge of the baseplate. Drain valves shall be grouped, labelled and readily accessible.

2.3 CASING APPURTENANCES

2.3.2 (Modification)

Sentinel warning valve shall be supplied.

2.4 CASING CONNECTIONS

2.4.5 (Modification)

Plugs shall have a shank at least 1 1/2" in length to permit the use of a pipe wrench.

2.4.6.4 (Modification)

Add after the first sentence "drilling template shall be furnished by vendor".

2.4.10 (Addition1)

Vendor shall provide readily accessible flanged casing connection(s) for injection of dry gas purge during extended outages. If connection(s) for other purposes exist which can also be used for this purpose, vendor shall so indicate on general arrangement drawing(s).

2.6 ROTATING ELEMENTS

2.6.1 Rotors

2.6.1.3 (Substitution)

Built-up rotors are not acceptable with blade tip velocities exceeding 250 m/s at maximum continuous speed, or with stage inlet steam temperatures in excess of 440°C.

2.6.1.5 (Modification)

Provision shall be made for field balancing.