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NATIONAL IRANIAN OIL REFINING & DISTRIBUTION COMPANY
NATIONAL IRANIAN OIL ENGINEERING
& CONSTRUCTION COMPANY

NIOEC SP

NIOEC SPECIFICATION

FOR

POSITIVE DISPLACEMENT COMPRESSORS ROTARY

FIRST EDITION

JULY, 2005

THIS SPECIFICATION IS THE PROPERTY OF NATIONAL IRANIAN OIL ENGINEERING & CONSTRUCTION COMPANY. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED TO THE OWNER. NEITHER WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF THE NATIONAL IRANIAN OIL ENGINEERING & CONSTRUCTION COMPANY.

IN THE NAME OF GOD**FOREWORD**

By their very nature, technical Specifications are continuously subject to modifications and revisions. To strengthen their merit and usefulness, continuous improvements, addendum, deletion of disparate information and consequently provision of updated revisions are to be made in order to ascertain that such Specifications meet the current requirements, inclusive of Iranian Petroleum Standards (IPS) and the recognized and acceptable national and international Standards, as well as the optimal codes and practices based on the accumulated in-house know-how and plant knowledge and experiences.

However, in reality, due to several reasons, not to mention the complexity of the matter, the ultimate goal of continuous direct embedment of the required changes on the relevant Specifications may be far reaching. Therefore, in the interim periods between the officially issued revisions, the required changes will appear in other documents related to the engineering and design work of the ongoing projects.

In response to the initiative of the Design and Engineering Directorate, and considering that the task of the execution of several important and mega projects for the realization of the new oil refineries, pipelines and oil terminals as well as improvements of the existing facilities, has been assigned to NIOEC, it was decided to update the NIOEC Specifications and to issue new official revisions.

The Design and Engineering Directorate was itself entrusted to carry out this important task, and as such by forming several special technical committees, working in close co-operation and cohesion and sharing their expertise and knowledge, the updated and revised NIOEC Specifications were successfully prepared and complied.

These Specifications are intended to be used for Oil Refineries, Distribution Depots, Oil Terminals, Pipelines and Pump Stations within NIOEC's projects, and have been proven to be of high value for such purposes. It must however be appreciated that these Specifications represent the minimum requirements and should in no way be interpreted as a restriction on the use of better procedures, engineering and design practices or materials.

We encourage and highly appreciate the users and other clear sighted and experts to send their comments on the Specifications to the Design and Engineering Director of NIOEC for evaluation and approval.

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NOTES:

- 1) THIS SHEET IS A RECORD OF ALL REVISIONS TO THIS SPECIFICATION.
- 2) WHEN APPROVED EACH REVISION SHALL BE CONSIDERED AS A PART OF THE ORIGINAL DOCUMENT.
- 3) NUMBER OF PAGES EXCLUDES THIS SHEET AND THE COVER SHEET.

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INTRODUCTION

To satisfy the requirements of this NIOEC Specification, Iranian Petroleum Standard IPS-M-PM-220 (revised on April 2012) with the modifications as specified hereinafter shall be strictly followed.

Articles 0 through 3 of this document replace entirely the related articles in the referenced IPS Standard.

This Specification gives technical specifications and general requirements for the purchase of "Positive Displacement Compressors Rotary" for use in refinery/ oil plant, distribution depots, pump stations and pipelines and is based on API" Standard 619, Fifth edition, December 2010, and shall be read in conjunction with that document.

Guidance for Use of this Specification

The amendments/supplement to API Standard 619 given in this Specification are directly related to the equivalent sections or clauses in API Standard 619. For clarity, the section and paragraph numbering of API Standard 619 has been used as far as possible. Where clauses in API are referenced within this Specification, it shall mean those clauses are amended by this Specification. Clauses in API that are not amended by this Specification shall remain valid as written.

The following annotations, as specified hereunder, have been used at the bottom right hand side of each clause or paragraph to indicate the type of change made to the equivalent clause or paragraph of API.

Sub. (Substitution) : The clause in API shall be deleted and replaced by the new clause in this Standard.

Del. (Deletion) : The clause in API shall be deleted without any replacement.

Add. (Addition) : The new clause with the new number shall be added to the relevant section of API.

Mod. (Modification): Part of the clause or paragraph in API shall be modified and/or the new description and/or statement shall be added to that clause or paragraph as given in this Standard

1. SCOPE

This Specification, contains the minimum requirements for Rotary-Type Positive Displacement Compressors used in refinery services, chemical plants, gas plants, petrochemical plants and where applicable, in exploration, production and new ventures.

Compliance by the compressor manufacturer with the provisions of this Specification does not relieve him of the responsibility of furnishing compressor and accessories of proper design, mechanically suited to meet guarantees at the specified service conditions.

Resolution on cases not explicitly stipulated in this specification, or on cases where conflicts may arise among the requirements of the referenced / relevant IPS and international standards shall be made through written consent and approval of NIOEC.

Deviations from this specification will only be permitted in obtaining written approval from NIOEC.

2. REFERENCES

The following standards, codes and specifications, to the extent specified herein after, shall constitute a part of this NIOEC specification. Latest edition of the undated referenced documents and the cited edition of the dated references shall apply. The applicability of changes made to the dated references, after the cited date shall be mutually agreed upon between NIOEC and the vendor/contractor.

IPS (IRANIAN PETROLEUM STANDARD)

IPS-M-PM-260	"Industrial Combustion Gas Turbines"
IPS-M-PM-300	"Special Purpose Gear Units"
IPS-M-PM-310	"Special Purpose Couplings"

NIOEC-SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	"NIOEC Specification for Units"
NIOEC-SP-44-01	"NIOEC Specification for Shell-and-Tube Heat Exchanger"
NIOEC-SP-44-02	"NIOEC Specification for Air-Cooled Heat Exchanger"
NIOEC-SP-46-02	"NIOEC Specification for General Purpose Steam Turbines"
NIOEC-SP-46-06	"NIOEC Specification for Special Purpose Steam Turbines"
NIOEC-SP-46-07	"NIOEC Specification for Lubrication, Shaft Sealing, and Control Oil Systems for Special Applications"
NIOEC-SP-47-10	"NIOEC Specification for Noise Control and Vibration"
NIOEC-SP-60-02	"NIOEC Specification for Low Voltage Induction Motors"

2.1. Equivalent to IPS Standard

Substitute the following IPS Standards as referred to throughout IPS- M-PM-220 to relevant NIOEC's Specifications as follows:

<u>IPS Standard</u>	<u>Relevant NIOEC Specification</u>
IPS-G-SF-900	NIOEC-SP-47-10
IPS-M-EL-132	NIOEC-SP-60-02
IPS-M-PM-240	NIOEC-SP-47-10
IPS-M-PM-250	NIOEC-SP-46-06
IPS-M-PM-260	-
IPS-M-PM-300	-
IPS-M-PM-310	-
IPS-M-PM-320	NIOEC-SP-46-07
IPS-G-ME-220	NIOEC-SP-44-01
IPS-G-ME-245	NIOEC-SP-44-02

3. UNITS

International system of units (SI) shall be used in accordance with NIOEC-SP-00-10, unless otherwise specified.

4. ADDENDUM TO IPS STANDARD (IPS- M-PM-220)

This addendum revises the below listed articles of the referenced standard as follows:

5.8.1.5. (Mod.)

Delete the words "If specified"

5.8.3.2.1. (Mod.)

Add to this clause:

Thrust bearings shall be designed to allow for reverse rotation under the process conditions specified.

6.1.1.4. (Sub.)

The equipment feet of all drivers shall be provided with vertical jack screws.

6.4.5.1.2. (Mod.)

Remove the bullet.

6.7.2. (Mod.)

Add to this clause:

The air intake shall not be less than 3 m (10 ft) above grade level, to prevent swirling dust and most insects from entering the filter. The air intake shall [PS] not be placed beneath a roof of any building in which flammable vapours may accumulate. The air intake shall [PS] not be located within 5 m (15 ft) of any process equipment, process pipe flanges, or open drains.

7.3.3.1.8. (Mod.)

Add to this clause:

Real time display of vibration and frequency analysis shall be available during the test.

7.3.4.3. Complete-unit test (Mod.)

Replace the first sentence by:

When specified, such components as gears, the driver and all auxiliaries that make up the complete compressor unit shall be tested together with the compressor during the mechanical running test. This will include, but not necessarily be limited to, coolers, vessels, piping, all instrumentation and all electrical equipment in the scope of supply of the vendor.