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

NIOEC SP

NIOEC SPECIFICATION FOR START-UP SEQUENCE & GENERAL COMMISSIONING PROCEDURES

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 on going 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-E-PR-280](#) (revised on July 2012) with the modifications as specified herein after shall be strictly followed.

Articles 1 and 2 of this document replace entirely the related articles in the referenced IPS Standard.

1. SCOPE

This Specification covers minimum process requirements for plant start-up sequences and general commissioning procedures for Non-Licensed Units or facilities. For Licensed Units, instructions given by the Licenser and requirements and format as set forth in this Specification shall be followed.

Although, the start-up sequences and commissioning procedures differ to some extent from process to process, the basic philosophy and general aspects shall conform to the concepts of this Specification.

However, considering the general commissioning and all activities to be performed prior initial start-up as outlined in this Specification, feed introduction to the Unit shall be according to the stepwise start-up procedure provided by the Contractor in the Unit Operating Manual.

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

2. REFERENCES

The following standards, codes, and specifications, to the extent specified hereinafter, 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.

API (AMERICAN PETROLEUM INSTITUTE)

API Std. 650, "Welded Steel Tanks for Oil Storage"

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERS)

ASME Code, Section VIII

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-PR-280 "Engineering Standard for Start-Up Sequence & General Commissioning Procedures" Revised on July 2012

NIOEC-SP (NIOEC SPECIFICATIONS)

[NIOEC-SP-00-10](#) "NIOEC Specification for Units"

[NIOEC-SP-00-62](#) "NIOEC Specification for Numbering System"

[NIOEC-SP-50-05](#) "NIOEC Specification for Field Pressure Testing"

2.1. EQUIVALENT TO IPS STANDARDS

Substitute the following IPS Standards as referred to throughout [IPS-E-PR-280](#) for the relevant NIOEC's Specifications as follows:

<u>IPS Standard</u>	<u>Relevant NIOEC Specification</u>
IPS-E-GN-100	NIOEC-SP-00-10
IPS-E-PR-308	NIOEC-SP-00-62
IPS-C-PI-350	NIOEC-SP-50-05

3. UNITS (Modification)

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

4. ADDENDUM TO IPS-E-PR-280

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

6. GENERAL REQUIREMENTS (Modification)

6.6. Monitoring & control system for all supervision and measuring the progress of activities shall be developed and provided by Contractor.

7.1. Operational Check-Out (Modification)

- f) Check that the following facilities have been installed so that the plant can be commissioned and put on stream:
- Start-up bypass lines.
 - Purge connections.
 - Steam-out connections.
 - Drains.
 - Temporary jumpovers.
 - Blinds.
 - Check valves.
 - Filters and Strainers.
 - Bleeders.
 - Steam traps.
 - Safety & relief valves.
 - Etc.

7.3. Final Inspection of Vessels (Modification)

Before the final bolting of coverplates and manholes, vessel interiors should be inspected for cleanliness, completeness, and proper installation of internal equipment. Inspection list shall include at least the following items where applicable:

- a) Tray installation; satisfactory testing (where is required).
- b) Internal drawoff piping.
- c) Catalyst supports, screens and others.
- d) Internal distributors.
- e) Liquid entrainment separators.
- f) Internal risers and vortex breakers.
- g) Thermowell location and length.

- h) Level instruments, location and range, internal float, external displacement and differential pressure type.
- i) Internal cement lining and coating.

7.4.2. Process and utility lines (addition)

- m) Where it is desirable to flush through a check valve, the check valve shall be removed with due consideration to the safety and protection of subjected equipment. Whenever it is not possible to remove check valve, the flopper must be removed and the cover replaced, in this case after completion of flushing activities the original gasket recommended by valve vendor must be used for check valve.

7.6. Acid Cleaning of Compressor Lines (substitution)

Mill scale, dirt, heavy greases, and other foreign materials that could enter the compressor and result in operating and maintenance problems must be removed from the compressor system. The following items must be acid cleaned:

- a) All make-up gas piping including spill-back lines.
- b) Make-up compressor suction lines and drums. Suction drums may be acid cleaned where practical.
- c) Make-up gas coolers and intercoolers.
- d) Fuel gas lines to gas turbine burners.

The procedure to be followed should be supplied by the cleaning Contractor, who must accept the responsibility of proposing and carrying out an acceptable and proven procedure for the entire cleaning operation. The general outline for a typical acid-cleaning operation is presented in Appendix A.

7.8. Breaking-In Compressors (addition)

- p) Check driver rotation and gear box.

ENGINEERING STANDARD

FOR

START-UP SEQUENCE AND GENERAL

COMMISSIONING PROCEDURES

ORIGINAL EDITION

DEC. 1997

This standard specification is reviewed and updated by the relevant technical committee on May 2004(1) and July 2012(2). The approved modifications are included in the present issue of IPS.

FOREWORD

The Iranian Petroleum Standards (IPS) reflect the views of the Iranian Ministry of Petroleum and are intended for use in the oil and gas production facilities, oil refineries, chemical and petrochemical plants, gas handling and processing installations and other such facilities.

IPS are based on internationally acceptable standards and include selections from the items stipulated in the referenced standards. They are also supplemented by additional requirements and/or modifications based on the experience acquired by the Iranian Petroleum Industry and the local market availability. The options which are not specified in the text of the standards are itemized in data sheet/s, so that, the user can select his appropriate preferences therein.

The IPS standards are therefore expected to be sufficiently flexible so that the users can adapt these standards to their requirements. However, they may not cover every requirement of each project. For such cases, an addendum to IPS Standard shall be prepared by the user which elaborates the particular requirements of the user. This addendum together with the relevant IPS shall form the job specification for the specific project or work.

The IPS is reviewed and up-dated approximately every five years. Each standards are subject to amendment or withdrawal, if required, thus the latest edition of IPS shall be applicable

The users of IPS are therefore requested to send their views and comments, including any addendum prepared for particular cases to the following address. These comments and recommendations will be reviewed by the relevant technical committee and in case of approval will be incorporated in the next revision of the standard.

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No.17, Street14, North kheradmand

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GENERAL DEFINITIONS

Throughout this Standard the following definitions shall apply.

COMPANY :

Refers to one of the related and/or affiliated companies of the Iranian Ministry of Petroleum such as National Iranian Oil Company, National Iranian Gas Company, National Petrochemical Company and National Iranian Oil Refinery And Distribution Company.

PURCHASER :

Means the "Company" where this standard is a part of direct purchaser order by the "Company", and the "Contractor" where this Standard is a part of contract document.

VENDOR AND SUPPLIER:

Refers to firm or person who will supply and/or fabricate the equipment or material.

CONTRACTOR:

Refers to the persons, firm or company whose tender has been accepted by the company.

EXECUTOR :

Executor is the party which carries out all or part of construction and/or commissioning for the project.

INSPECTOR :

The Inspector referred to in this Standard is a person/persons or a body appointed in writing by the company for the inspection of fabrication and installation work.

SHALL:

Is used where a provision is mandatory.

SHOULD:

Is used where a provision is advisory only.

WILL:

Is normally used in connection with the action by the "Company" rather than by a contractor, supplier or vendor.

MAY:

Is used where a provision is completely discretionary.

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