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

NIOEC SP

NIOEC SPECIFICATION FOR WINTERIZING & HEAT CONSERVATION

FIRST EDITION

JULY, 2005

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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-E-PR-420 (modified on March 2001) with the modifications as specified herein after shall be strictly followed.

Articles 0 through 4 of this document replace entirely the related articles in the referenced IPS Standard.

1. SCOPE

NIOEC Specifications cover the general requirements for detailed engineering, procurements, testing inspection & construction of refinery/oil plant, distribution depots, pump stations and pipelines. This Specification covers the minimum requirements for protection of process and utilities and all associated equipment and flow lines and instruments against the temperature which would cause congealing or freezing of contents, interfere with operation or cause damage to equipment or pipe lines and for heat conservation requirement as would be determined by process conditions. The heat conservation system shall be designed for continuous operations while, winterizing shall be for seasonal operation. The two systems shall be separate from each other.

Compliance with the requirements of this Specification and the Standards and codes referred to herein shall not relieve the contractor or manufacturer of their responsibility to follow safe.

Resolution on cases not explicitly stipulated in this Specification or on cases where conflicts may arise among the requirements of the referenced/relevant consent and approval of NIOEC.

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

2. REFERENCES

The following standard, codes and specification, 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 dated references, after the cited date shall be mutually agreed upon between NIOEC and vendor/contractor.

API (AMERICAN PETROLEUM INSTITUTE)

API RP-550, Section 8.5 "Winterizing"

IPS (IRANIAN PETROLEUM STANDARD)

IPS-E-PR-420 "Engineering Standard for Process Design of Heat Tracing and Winterizing"

NIOEC-SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	"NIOEC Specification for Units"
NIOEC-SP-00-55	"NIOEC Specification for Piping & Instrumentation Diagrams (P&IDs)"
NIOEC-SP-60-19	"NIOEC Specification for Electrical Heat Tracing"
NIOEC-SP-70-17	"NIOEC Specification for Instrument Protection"
NIOEC-SP-80-01	"NIOEC Specification for Thermal Insulations"
NIOEC-SP-80-03	"NIOEC Specification for Heat Transfer Cement"

NIOEC-SD (NIOEC STANDARD DRAWING)

NIOEC-SD-5001-1/1-A1	"Steam Tracing Details Piping 4" & Smaller"
NIOEC-SD-5003-1/1-A1	"Steam Trap & Drip Pot Piping"
NIOEC-SD-5004-1/1-A1	"Utility Station, Emergency Showers & Sample Cooling Details"

2.1. Equivalent to IPS Standard

Substitute the following IPS Standards as referred to throughout IPS-E-PR-420 to relevant NIOEC's Specifications as follows:

<u>IPS Standard</u>	<u>Relevant NIOEC Specification</u>
IPS-E-PR-230	NIOEC-SP-00-55
IPS-M-EL-190	NIOEC-SP-60-19
IPS-C-TP-701& IPS-E-TP-700	NIOEC-SP-80-01

3. UNITS

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

4. SYMBOLS & ABBREVLATIONS

CM: Collection Manifold

DM: Distribution Manifold

DN: Diameter Nominal (Pipe Size), in (mm)

ET: Electric Traced and Insulation

ETT: Electric Traced with Heat Transfer Cement

H: Heat Conservation

ID: Inside Diameter

MI: Mineral Insulation

PD Meters: Positive Displacement Meters

P&IDS: Piping and Instrumentation Diagrams

Ref: Reference

OD: Outside Diameter

SJ: Steam Jacketing Pipe and Insulation

ST: Steam Traced and Insulation

STS: Steam Traced with Spacers and Insulation

STT: Steam Traced with Heat Transfer Cement and insulation

UOP: Universal Oil Products

W: Winterization

WS: Winter Seal

WISI: Winterize Insulator, Steam Trace, Insulate

5. MODIFICATION TO IPS-E-PR-420 (Modified on 2001)

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

7.1.5. (Modification)

The last paragraph shall be modified as follows:

Molten sulfur and asphalt lines shall be maintained between 118°C (245°F) and 158°C (316°F).

5.2. (Modification)

Add the following paragraph:

f) Winterizing By Circulation

Piping shall be designed so as to avoid tracing whenever possible by circulation of the fluid within the piping. Circulation can be maintained during equipment shut-down in piping such as cooling water by using a small by-pass between supply and return lines near the equipment. Piping shall be designed for normally flowing lines to eliminate stagnant pockets where freezing may occur. Where unavoidable, protection by insulation and steam tracing should be provided. Non flowing lines, intermittent service, and dead ended lines should be avoided as far as possible. Where unavoidable such lines should be insulated and steam traced. Steam injection in to large water lines at cooling tower water circulation pumps etc. may be considered to prevent freezing of stagnant pockets in the pump.

7.2.5.1 - (Addition)

Add the following paragraph:

d) Overhead water supply and return headers shall be protected against freezing in the following manner:

1. A by-pass shall be provided between and at the extreme ends of the supply and return headers for use in maintaining circulation.
2. Block valves shall be provided at the high points of the branch lines in a horizontal position near the header. The section of line between the header and the block valve shall be of minimum length. Alternately branch lines may be treated as headers as in (a) above.
3. Water lines for hose stations shall be insulated with the steam line to the hose station.
4. Drains shall be provided at all low pints and vents at all high points.

7.3.1 - (Modification)

The second sentence of paragraph shall be modified as follows:

However, when electronic instruments are heat traced the type of heat tracing should be to the instrument protection (NIOEC-SP-70-17).

8.2.1.4 - (Modification)

Add the following sentence:

Insulated spacer blocks may be installed to keep the tracer 13 mm away from the pipe as shown in detail "H" on drawing NIOEC-SD-5001-1/1-A1 or, where better temperature control is required, electric tracing shall be used.

8.2.5.4 - (Modification)

Add the following sentence:

- e) Pipe fittings shall be 3000 lb socket welding. Unions shall have spherically ground seats and shall only be used where frequent maintenance requires opening of the line. All fitting shall be in straight runs of pipe only and not in loops etc.
- f) Tubing unions in 4.1 barg steam service use for joining straight length of tubing shall be socket type and may be used under insulation. Tubing union fittings compression type shall be installed outside of the parent pipe insulation and run of loops and not in the bend of the loop. (see NIOEC-SD-5001-1/1-A1 for application.)

8.2.6.3 - (Modification)

Add the following sentence in the end of paragraph:

See NIOEC-SD-5003-1/1-A1 for steam trap & drip pot piping.

8.3 Insulation.**8.3.1 (Modification)**

Add the following paragraph:

- f - See NIOEC-SD-5004-1/1-A1 for utility station, emergency showers & sample cooling details.

8.8.1 - (Modification)

Add the following sentence in the end of paragraph:

See NIOEC-SP-80-03 for materials and application.

ENGINEERING STANDARD

FOR

PROCESS DESIGN OF HEAT TRACING

AND WINTERIZING

ORIGINAL EDITION

JAN. 1996

This standard specification is reviewed and updated by the relevant technical committee on Mar. 2001. The approved modifications are included in the present issue of IPS.

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