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

NIOEC SP

NIOEC SPECIFICATION FOR PERFORMANCE GUARANTEE

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-250 (Dec. 2003) 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 sets forth the content and the extent of the performance guarantee concerning processes and equipment as well as product's quality and quantity. The requirements outlined herein are supplementary to the guarantees listed on the individual job specification/duty specification/data sheet.

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

Resolution on cases not explicitly stipulated in this Specification, or on cases where conflicts may arise among the requirements of the referenced IPS and the international standards, shall be made through written consent and approval of 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 Technical Data Book", Petroleum Refining, 4th. Ed., Copyright 1983

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

- Test Method ASTM D-86
- Test Method ASTM D-93
- Test Method ASTM D-1160
- Test Method ASTM D-323
- Test Method ASTM D-156
- Test Method ASTM D-1500
- Test Method ASTM D-155
- Test Method ASTM D-130
- Test Method ASTM D-97
- Test Method ASTM D-976
- Test Method ASTM D-189
- Test Method ASTM D-2500
- Test Method ASTM D-2709
- Test Method ASTM D-1522
- Test Method ASTM D-2163

- Test Method ASTM D-2420
- Test Method ASTM D-70
- Test Method ASTM D-5
- Test Method ASTM D-36
- Test Method ASTM D-113
- Test Method ASTM D-6
- Test Method ASTM D-92
- Test Method ASTM D-4
- Test Method ASTM D-445
- Test Method ASTM D-2788
- Test Method ASTM D-1522

IP (THE INSTITUTE OF PETROLEUM)

- Test Method IP-170
- Test Method IP-57
- Test Method IP-21
- Test Method IP-71

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-PR-250 "Engineering Standard for Performance Guarantee"

NIOEC SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	"NIOEC Specification for Units"
NIOEC-SP-00-54	"NIOEC Specification for Basic Engineering Design Data"
NIOEC-SP-00-82	"NIOEC Specification for Process Design of Plant Waste Water Sewer Systems"
NIOEC-SP-00-83	"NIOEC Specification for Process Design of Plant Waste Water Treatment & Recovery Systems"
NIOEC-SP-00-84	"NIOEC Specification for Process Design of Plant Solid Waste Treatment & Disposal Systems"

2.1. EQUIVALENT TO IPS STANDARDS

Substitute the following IPS Standards as referred to throughout IPS-E-PR-250 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-200	NIOEC-SP-00-54
IPS-E-PR-725	NIOEC-SP-00-82
IPS-E-PR-730	NIOEC-SP-00-83
IPS-E-PR-735	NIOEC-SP-00-84

3. ADDENDUM TO IPS-E-PR-250

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

4. SYMBOLS AND ABBREVIATIONS. (Addition)

FP:	Flash Point.
FQ:	Flow Totalizer.
HPS:	High Pressure Steam.
IP:	The Institute of Petroleum.
IPS:	Iranian Petroleum Standards.
NPSH:	Net Positive Suction Head.

5. UNITS (Modification)

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

6. (Addition)

The guaranteed figures shall be defined in the project contract.

7.4.2 (Modification)

The performance tests shall be conducted by COMPANY after notification of CONTRACTOR under the technical advice of Contractor.

Appendix C (Modification)

C.2.2 Positive displacement type flow totalizer (PD meter)

$$V = [R(E) - R(S)] \cdot K_t / K_d \quad (\text{Eq. C.6})$$

T_{ai} instead of T_{ia} in (Eq. C.9) and (Eq. C.13)

M_{ai} instead of M_{ia} in (Eq. C.14)

In below of Eq.C.10

P (b), T (b), M (b) are absolute pressure, absolute temperature and molecular mass for design respectively;

In below of Eq.C.16

D (ai) is averaged density at actual flowing condition.

For liquid flow:

D (ai) is converted by averaged actual flowing temperature T(ai) and averaged operating density at 15/4°C (water).

For steam flow:

D (ai) is converted by averaged actual flowing pressure P (ai) and temperature T(ai)

P (ai) is averaged actual flowing pressure

Appendix D (Substitution)

The measure system tolerances shall meet the latest ASTM regulations and/or the following figures whichever is more stringent.

ENGINEERING STANDARD

FOR

PERFORMANCE GUARANTEE

ORIGINAL EDITION

JULY 1997

This standard specification is reviewed and updated by the relevant technical committee on Dec. 2003. The approved modifications are included in the present issue of IPS.

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0. INTRODUCTION

The Standard Practice Manuals titled as "Fundamental Requirements for the Project Design and Engineering" is intended for convenience of use and a pattern of follow-up and also guidance.

These Standard Engineering Practice Manuals also indicate the checkpoints to be considered by the process engineers for assurance of fulfillment of prerequisites at any stage in the implementation of process plant projects.

It should be noted that these Iranian Petroleum Standards (IPS), as Practice Manuals do not profess to cover all stages involved in every project, but they reflect the stages that exist in general in process projects of oil, gas and petrochemical industries of Iran.

These preparation stages describe the following, three main phases, which can be distinguished in every project & include, but not be limited to:

- Phase I)** Feasibility Studies, Process Evaluation and the Basic Design Stages
(Containing Seven Standards).
- Phase II)** Detailed Design, Engineering and Procurement Stages
(Containing Two Standards).
- Phase III)** Start-up Sequence and General Commissioning Procedures
(Containing two Standards).

The process engineering standards of this group include the following Standards:

<u>STANDARD CODE</u>	<u>STANDARD TITLE</u>
I) Manuals of Phase I (Numbers 1-7)	
IPS-E-PR-150	"Basic Design Package and Recommended Practice for Feasibility Studies"
IPS-E-PR-170	"Process Flow Diagram"
IPS-E-PR-190	"Layout and Spacing"
IPS-E-PR-200	"Basic Engineering Design Data"
IPS-E-PR-230	"Piping & Instrumentation Diagrams (P&IDs)"
IPS-E-PR-250	"Performance Guarantee"
II) Manuals of Phase II (Numbers 8 & 9)	
IPS-E-PR-260	"Detailed Design, Engineering and Procurement"
IPS-E-PR-300	"Plant Technical and Equipment Manuals (Engineering Dossiers)"
IPS-E-PR-308	"Numbering System"
III) Manuals of Phase III (Numbers 10 & 11)	
IPS-E-PR-280	"Start-up Sequence and General Commissioning Procedures"
IPS-E-PR-290	"Plant Operating Manuals"

This Engineering Standard Specification covers:

"PERFORMANCE GUARANTEE"

1. SCOPE

This Engineering Standard Specification sets forth the content and the extent of the performance guarantee concerning processes and equipment as well as product's quality and quantity. The requirements outlined herein are supplementary to the guarantees listed on the individual job specification/duty specification/data sheet.

Note:

This standard specification is reviewed and updated by the relevant technical committee on Dec. 2003. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No. 218 on Dec. 2003. These modifications are included in the present issue of IPS.

2. REFERENCES

Throughout this Standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies.

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- Test Method ASTM D-1160
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- Test Method ASTM D-92