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

NIOEC SP

NIOEC SPECIFICATION FOR PIPE SUPPORTS

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 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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2	SEPTEMBER, 2016	M.GOODARZI	GH.ANVARI	M.R.FARZAM	A. ARMAN MOGHADAM
1	MAY, 2007			M.R.FARZAM	M.A.A.SAJEDI
0	JULY, 2005	M.KHEZRI	A.NAVARCHI	M.R.FARZAM	M.A.A.SAJEDI
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INTRODUCTION

To satisfy the requirements of this NIOEC Specification, Iranian Petroleum Standard IPS-G-PI-280 (2) December 2009, 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.

Part 7. of IPS standard gives technical specifications and general requirements for the fabrication and installation of pipe supports and is supplement to reference standard MSS-SP-89, 2003 and shall be read in conjunction with that document. The amendments/ supplement to MSS Standard 89 given in clause 7. of IPS Standard are directly related to the equivalent sections or clauses in MSS Standard 89. For clarity, the section and paragraph numbering of MSS Standard 89 has been used as far as possible. Where clauses in MSS are referenced within IPS Standard, it shall mean those clauses are amended by IPS Standard. Clauses in "MSS" that are not amended by this Standard shall remain valid as written.

1. SCOPE

This Specification covers the requirements for selection, design, fabrication and erection of supports and supporting elements used for on-plot and off-plot piping in oil Plants, Refineries and Distribution Depot.

Both insulated and un-insulated piping are covered by this Specification.

The Contractor shall determine by careful security which of the requirements are the more stringent and which combination of requirements will be acceptable as regards safety, economic and legal aspects.

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.

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

ASTM A 6/A 6M	"Standard Specification for General Requirements for Rolled Steel Plates, Shapes, Steel Piling, and Bars for Structural Use"
ASTM A 123/A 123M	"Standard Specification for Zinc (Hot Dip Galvanized) Coating or Iron and Steel Products"
ASTM A 153/A 153M	"Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware"
ASTM A 403/A 403M	"Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings"

ASTM B 633	"Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel"
ASTM A 653/A 653M	"Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process"
ASTM B 695	"Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel"
ASTM B 696	"Standard Specification for Coatings of Cadmium Mechanically Deposited"
ASTM B 766	"Standard Specification for Electrodeposited Coatings of Cadmium"

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERS)

ASME B31.3	"Process Piping"
ASME B31.4	"Pipe line Transportation Systems for Hydrocarbons, and other Liquids"
ASME B31.8	"Gas Transmission and Distribution Piping Systems"
ASME Section IX	"Welding and Brazing Qualification"

MSS (MANUFACTURERS STANDARDIZATION SOCIETY)

SP-58	"Pipe Hangers and Supports Materials, Design and Manufacturer"
SP-69	"Pipe Hangers and Supports Selection and Application"
SP-89	"Pipe Hangers and Supports Fabrication and Installation Practices"
SP-90	"Guidelines on Terminology for Pipe Hangers and Supports"

NIOEC SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	"NIOEC Specification for Units"
NIOEC-SP-10-01	"NIOEC Specification for Concrete"
NIOEC-SP-50-01	"NIOEC Specification for General Piping, Process and Utility Design Equipment Layout And Drawing Procedure"
NIOEC-SD-50-06	"NIOEC Specification for Standard Pipe Support"

IPS (IRANIAN PETROLEUM STANDARD)

IPS-G-PI-280(2)	"General Standard for Pipe supports" December 2009
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UL (UNDERWRITERS LABORATORIES)

UL 203	"Pipe Hanger Equipment for Fire Protection Service"
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2.1. Substitute the following IPS Standards as referred to throughout IPS-G-PI-280(2) to relevant NIOEC's Specifications as follows:

<u>IPS Standard</u>	<u>Relevant NIOEC Specification</u>
IPS-E-CE-200	NIOEC-SP-10-01
IPS-E-GN-100	NIOEC-SP-00-10
IPS-E-PI-240	NIOEC-SP-50-01
IPS-G-PI-280	NIOEC-SP-50-23
IPS-D-PI-130	NIOEC-SD-50-06

3. UNITS

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

4. DEFINITIONS AND TERMINOLOGY

For the purpose of this Specification the terminology given in MSS-SP-90 shall apply. In addition, the following definitions and terminology shall hold.

Cradle or Pipe Shoe: A device placed between the pipe and the supporting structure. Usually made from plate or cut from sections, welded or clamped to the pipe.

Dummy Support: A support welded to an elbow of the prefabricated pipe. The pipe dummy will rest on the support structure and so support the pipe at the change of direction. A pipe dummy is made from pipe, usually of a smaller diameter than the pipe to which it is welded.

Goal Post Support: Frame type support for situations where heavy loads may be expected.

Shoe: Normally a tee section attached to the pipe to transmit the load or forces to the adjacent structure.

Structural Attachments: Structural attachments include elements which are welded, bolted, or clamped to the pipe, such as clips, lugs, rings, clamps, clevises, straps, and skirts.

Supporting Elements: The broad terms "Supporting Elements" or "Supports" shall encompass the entire range of the various methods of carrying the weight of pipelines, insulation, and the fluid carried. It therefore includes "Hangers" which are generally considered as those elements which carry the weight from above, with the supporting members being mainly in tension.

Likewise, it includes "Supports" which on occasion are delineated as those which carry the weight from below, with the supporting members being mainly in compression. In many cases a supporting element may be a combination of both of these.

Sway Strut: An adjustable device, usually applied for restraining movement of piping in one direction while providing for movement in another direction.

Trunnion: A tubular supporting device, branching-off horizontally from a vertical line, and resting on, or suspended from, the supporting structure.

5. MODIFICATION TO IPS-G-PI-280 (2)

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

ARTICLE 6. (Addition)

Add the following paragraph:

- 6.11 Alloy steel pipe clamps shall be used for lines operating above 399°C and below -29°C.
- 6.12 All contact areas shall be designed or arranged so that there is no sump or galvanic corrosion.
- 6.13 Variable spring hanger scales are to be permanently attached to the hanger case and they shall be calibrated in kgs/mm.
- 6.14 Maximum deviation from spring constant rate of change for variable spring hangers as published in Vendor's Catalog must not exceed 10% on either the heavy or the light side.
- 6.15 Variable and constant spring hangers shall be tested and present so that the marked operating load is within 2% of the load shown on the hanger drawing after the prescribed movement.
- 6.16 Constant support hangers must have a field load adjustment of at least 10% on either side of the operating load marked as specified in 6.19.
- 6.17 Hanger assembly will be capable of deflecting 4° minimum from vertical position between pivot points with no appreciable effect on the operational function of the assembly.
- 6.18 Installed and operating loads will be clearly marked on the spring casing so that painting will not destroy or obscure the marks.
- 6.19 Where spring casings or components of the assembly are not capable of supporting hydrotest loads, a hanger rod must be shipped with the assembly and will be clearly marked "For use during hydrotest only".
- 6.20 Beams supplied by the Vendor shall be designed so that there is a maximum of 1.6 millimeters deflection for the maximum loads indicated on the drawings.
- 6.21 Tandem assemblies do not include weights of riser clamps, hanger casings, or connecting beams in the design loads shown on the drawings. Vendors must adjust loads to accommodate this additional weight.



IRANIAN PETROLEUM STANDARDS

استانداردهای نفت ایران

IPS

IPS-G-PI-280 (2)

GENERAL STANDARD
FOR
PIPE SUPPORTS

SECOND REVISION
DECEMBER 2009

استاندارد عمومی
برای
تکیه گاههای لوله

ویرایش دوم
آذر ۱۳۸۸

DEPUTY MINISTER
OF
ENGINEERING & LOCAL MANUFACTURING
RESEARCH & STANDARDS

معاونت مهندسی و ساخت داخل



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تحقیقات و استانداردها

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 is based on internationally acceptable standards and includes 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.

Standards and Research department
No.19, Street14, North kheradmand

Karimkhan Avenue, Tehran, Iran .
Postal Code- 1585886851
Tel: 88810459-60 & 66153055

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استانداردهای نفت ایران (IPS) منعکس کننده دیدگاههای وزارت نفت ایران است و برای استفاده در تأسیسات تولید نفت و گاز، پالایشگاههای نفت، واحدهای شیمیایی و پتروشیمی، تأسیسات انتقال و فراورش گاز و سایر تأسیسات مشابه تهیه شده است.

استانداردهای نفت، براساس استانداردهای قابل قبول بین‌المللی تهیه شده و شامل گزیده‌هایی از استانداردهای مرجع در هر مورد می‌باشد. همچنین براساس تجربیات صنعت نفت کشور و قابلیت تأمین کالا از بازار داخلی و نیز برحسب نیاز، مواردی بطور تکمیلی و یا اصلاحی در این استاندارد لحاظ شده است. مواردی از گزینه‌های فنی که در متن استانداردها آورده نشده است در داده برگ‌ها بصورت شماره گذاری شده برای استفاده مناسب کاربران آورده شده است.

استانداردهای نفت، بشکلی کاملاً انعطاف پذیر تدوین شده است تا کاربران بتوانند نیازهای خود را با آنها منطبق نمایند. با این حال ممکن است تمام نیازمندی‌های پروژه‌ها را پوشش ندهند. در این گونه موارد باید الحاقیه‌ای که نیازهای خاص آنها را تأمین می‌نماید تهیه و پیوست نمایند. این الحاقیه همراه با استاندارد مربوطه، مشخصات فنی آن پروژه و یا کار خاص را تشکیل خواهند داد.

استانداردهای نفت تقریباً هر پنج سال یکبار مورد بررسی قرار گرفته و روزآمد می‌گردند. در این بررسی‌ها ممکن است استاندارد حذف و یا الحاقیه‌ای به آن اضافه شود و بنابراین همواره آخرین ویرایش آنها ملاک عمل می‌باشد.

از کاربران استاندارد، درخواست می‌شود نقطه نظرها و پیشنهادات اصلاحی و یا هرگونه الحاقیه‌ای که برای موارد خاص تهیه نموده‌اند، به نشانی زیر ارسال نمایند. نظرات و پیشنهادات دریافتی در کمیته‌های فنی مربوطه بررسی و در صورت تصویب در تجدید نظرهای بعدی استاندارد منعکس خواهد شد.

ایران، تهران، خیابان کریمخان زند، خردمند شمالی، کوچه چهاردهم، شماره ۱۹

اداره تحقیقات و استانداردها

کدپستی : ۱۵۸۵۸۸۶۸۵۱

تلفن : ۶۰ - ۸۸۸۱۰۴۵۹ و ۶۶۱۵۳۰۵۵

دور نگار : ۸۸۸۱۰۴۶۲

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