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

NIOEC SP

NIOEC SPECIFICATION
FOR
ONSHORE FACILITIES

SECOND EDITION

JULY, 2009

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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.

REVISION INDEX

REV. PAGE	1	2	3	4	5	REV. PAGE	1	2	3	4	5	REV. PAGE	1	2	3	4	5	REV. PAGE	1	2	3	4	5
1		×				26						51						76					
2		×				27						52						77					
3	×	×				28						53						78					
4		×				29						54						79					
5		×				30						55						80					
6						31						56						81					
7						32						57						82					
8						33						58						83					
9						34						59						84					
10						35						60						85					
11						36						61						86					
12						37						62						87					
13						38						63						88					
14						39						64						89					
15						40						65						90					
16						41						66						91					
17						42						67						92					
18						43						68						93					
19						44						69						94					
20						45						70						95					
21						46						71						96					
22						47						72						97					
23						48						73						98					
24						49						74						99					
25						50						75						100					

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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CONTENTS:	PAGE NO.
INTRODUCTION.....	2
1. SCOPE	2
2. REFERENCES.....	2
3. UNITS	3
4. DEFINITIONS AND TERMINOLOGY	4

INTRODUCTION

To satisfy the requirements of this NIOEC Specification, Iranian Petroleum Standard IPS-G-CE-470 (Revised on February 2012) with the modifications as specified hereinafter shall be strictly followed.

Articles 1 through 4 this document replaces entirely the related article in the referenced IPS Standard.

1. SCOPE

This Specification gives general criteria relevant to the planning, design and construction of structures set in the maritime environment, as may be encountered in various civil engineering projects in the field of Petroleum Industries.

The structures to which this Standard is applicable are those that are located at, or are close to the shore. It includes different aspects of planning, design and construction of breakwaters, berthing and mooring facilities, and shore protections.

Offshore structures are not covered by this Standard, although certain aspects may be found to be common in both fields.

This Specification is written in general terms and its application to any particular project may be subject to special requirements of the work under consideration.

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/relevant 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.

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-G-CE-470 (Revised on February 2012)	“Engineering Standard for Onshore Facilities”
IPS-E-TP-740 (Revised on March 2010)	“Engineering Standard for Corrosion Considerations in Material Selection”

BSI (BRITISH STANDARD INSTITUTION)

BS 6349: Part 1	“Maritime Structures- Part 1: Code of Practice for General Criteria”
BS 6349: Part 2	“Maritime Structures- Part 2: Code of Practice for Design of Quay Walls, Jetties and Dolphins”

BS 6349: Part 4	“Maritime Structures- Part 4: Code of Practice for Design of Fendering and Mooring Systems”
BS 6349, Part 7	“Maritime Structures- Part 7: Guide to the Design Construction Breakwaters”
BS 7361, Part 1	“Cathodic Protection Part 1: Code of Practice for Land Marin Applications”

NIOEC-SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-01	“NIOEC Specification for Civil Design Criteria”
NIOEC-SP-00-02	“NIOEC Specification for Site Preparation-Earthwork and Sewers”
NIOEC-SP-00-03	“NIOEC Specification for Ground Improvement”
NIOEC-SP-00-05	“NIOEC Specification for Excavation and Backfill for Civil Work”
NIOEC-SP-00-10	“NIOEC Specification for Units”
NIOEC-SP-10-01	“NIOEC Specification for Concrete”
NIOEC-SP-10-12	“NIOEC Specification for Piles”
NIOEC-SP-10-16	“NIOEC Specification for Retaining Walls and Slope Protection”
NIOEC-SP-10-17	“NIOEC Specification for Soil Engineering”
NIOEC-SP-30-04	“NIOEC Specification for Work to be done and Materials to be used in Masonry Buildings”

2.1. Equivalent to IPS Standard

Substitute the following IPS Standards as referred to throughout IPS-G-CE-470 to relevant NIOEC's Specifications as follows:

<u>IPS Standard</u>	<u>Relevant NIOEC Specification</u>
IPS-E-GN-100	NIOEC-SP-00-10
IPS-M-CE-105	NIOEC-SP-30-04
IPS-E-CE-110	NIOEC-SP-10-17
IPS-C-CE-112	NIOEC-SP-00-02
	NIOEC-SP-00-03
	NIOEC-SP-00-05
IPS-E-CE-130	NIOEC-SP-10-12
IPS-E-CE-140	NIOEC-SP-10-16
IPS-C-CE-200	NIOEC-SP-10-01
IPS-E-CE-500	NIOEC-SP-00-01

3. UNITS

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

4. DEFINITIONS AND TERMINOLOGY

The following terms are defined for general use in this Standard.

Anchorage Area: A place where ships may be held for quarantine inspection, to await docking space, Sometimes while removing ballast in preparation for taking on cargo, or to await favorable weather conditions.

Artificial Harbor: Harbor protected from the effect of waves by breakwaters or one created by dredging.

Bollard: On a quay or vessel, a short upright post round which ropes are secured for purposes of mooring.

Breakwater: A structure protecting a shore area, harbor, anchorage, or basin from waves.

Bulkhead: A structure separating land and water areas, primarily designed to resist earth pressures. See also Seawall.

Buoy: A float; especially a floating object moored to the bottom, to mark a channel, anchor, shoal rock, etc.

Cofferdam: A structure, usually temporary, built for the purpose of excluding water or soil sufficiently to permit construction to proceed without excessive pumping and to support the surrounding ground.

Cellular Cofferdam: A cofferdam consisting of a series of filled cells of circular or other shape in plan.

Double-wall Cofferdam: A cofferdam enclosed by a wall consisting of two parallel lines of sheeting tied together, supporting against external pressure.

Dock: A general term used to describe a marine structure for the mooring or tying up of vessels, for loading and unloading cargo, or for embarking and disembarking passengers.

Dolphins: Marine structures for mooring vessels. They are commonly used in combination with piers and wharves to shorten the length of these structures and are a principal part of the fixed-mooring-berth type of installation.

Groin: A shore protective structure (built usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shore. See also Jetty.

Harbor: A water area partially enclosed and so protected from storms as to provide safe and suitable accommodation for vessels seeking refuge, supplies, refueling, repairs, or the transfer of cargo.

Jetty: A structure providing a berth on berths at some distance from the shore. A Jetty may be connected to the shore by an access trestle on causeway, or may be of the island type.

Marginal Berth: A berth parallel to the shore.

Marine Terminal: That part of a port or harbor that provides docking, cargo-handling, and storage facilities.

Offshore Mooring: Such an anchorage consists of a number of anchorage units, each consisting of one or more anchors, chains, sinkers, and buoys to which the ship will attach its mooring lines. These anchorages are supplemented in most cases by the ship's bow anchors.

Pier: A structure extending out into the water from the shore, to serve as a landing place, a recreational facility, etc., rather than to afford coastal protection.

Port: A harbor where marine terminal facilities are provided. These consist of piers or wharves at which ships berth while loading or unloading cargo, transit sheds and other storage areas.

where ships may discharge incoming cargo, and warehouses where goods may be stored for longer periods while awaiting distribution or sailing.

Quay or Wharf: A stretch of paved bank, or a solid artificial landing place parallel to the navigable waterway, for use in loading and unloading vessels.

Quay Wall: Similar to a wharf which is backed up by ground.

Ro-Ro (Roll on / Roll off) ramp: A ramp on bridging structure which enables vehicles to pass between a Ro-Ro ship's vehicle decks and the shore.

Seawall: A structure separating land and water areas, primarily designed to prevent erosion and other damage due to wave action. See also Bulkhead.

Seich: An apparent tide in a lake due to the pendulous motion of the water when excited by wind.

Training Wall: A wall or jetty to direct current flow.

Tsunami: A tidal wave caused by an earthquake or volcanic eruption.

ENGINEERING AND CONSTRUCTION STANDARD**FOR****ONSHORE FACILITIES****FIRST EDITION****FEBRUARY 2012**

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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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