

NIOEC-SP-50-22(1)							
DOCUMENT CODE							NO. OF PAGES: 4
PLAN/PRJ/SUB	UNIT	PHASE	DISCIPLINE	DOCUMENT TYPE	SERIAL NO.	REV. NO.	DATE
NIOEC	000	EG	PI	SP	5022	A1	DECEMBER,2015



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

NIOEC SP

NIOEC SPECIFICATION FOR PIPING FLEXIBILITY ANALYSIS

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.

REVISION INDEX

EV. GE					EV. GE					EV. AGE					EV. AGE				
1	x				26					51					76				
2	x				27					52					77				
3	x				28					53					78				
4	x				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.

5					
4					
3					
2					
1	DEC.2015	M.GOODARZI	M.R.FARZAM	A.KARGARNAJAFI	A.ARMANMOGHADAM
0	MARCH, 2005	M.KHEZRI	A.NAVARCHI	M.R.FARZAM	M.A.A.SAJEDI
REV.	DATE	PREPARED	CHECKED	APPROVED	AUTHORIZED

CONTENTS:	PAGE NO.
INTRODUCTION	2
1. SCOPE	2
2. REFERENCES	2
3. UNITS	3
4. CHANGE THE FOLLOWING ARTICLES IN IPS-E-PI-200(1)	3

INTRODUCTION

To satisfy the requirements of this NIOEC Specification, Iranian petroleum standard [IPS-E-PI-200](#)(1) Dec.2014 with the consideration as specified herein after shall be strictly followed.

Articles 0 through 2 of this document replace entirely the related articles in the referenced IPS standard.

1. SCOPE

This Specification covers the basic requirements for flexibility analysis of Piping System in refinery, oil plant, distribution depots and pump station.

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 international standards, shall be made through written consent and approval of NIOEC.

2. REFERENCES

Throughout this Specification the following dated and undated standards/ codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this Specification.

For undated references, the latest edition of the referenced document (including any supplements and amendments) applies. For dated references, the edition cited applies.

The applicability of changes in dated references that occur after the cited date shall mutually be agreed upon by NIOEC and the Vendor/Contractor.

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERS)

ASME Section VIII	"Rules for Construction of Pressure Vessels" Division I
ASME Section III	"Boiler and Pressure Vessel Code" Part NB-3647.1
ASME B16.5	"Pipe Flanges and Flanged Fittings"
ASME B.16.9	"Factory-Made Wrought Steel Butt welding Fittings"
ASME B.16.25	"Butt welding Ends"
ASME B16.47	"Large Diameter Steel flanges"
ASME B.31.1	"Power Piping"
ASME B.31.3	"Chemical Plant and Petroleum Refinery Piping"
ASME B31.4	"Pipeline transportation Systems for liquid Hydrocarbons and Other Liquids"

ASME B.73.1 M "Horizontal End Suction Centrifugal Pumps for Chemical Process"

API (AMERICAN PETROLEUM INSTITUTE)

API RP 520 "Sizing, Selection, and Installing Pressure Relieving Devices"
 API 560 "Fire Heaters for General Services"
 API STD. 610 "Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries"
 API 612 "Special Purpose Steam Turbines for refinery Services"
 API STD. 617 "Axial and Centrifugal Compressors and Expander Compressors for Petroleum, Chemical and Gas Industry Services"
 API 650 "Welded Steel tanks for Oil Storage"
 API 661 "Air Cooled Heat exchangers for General Services"
 API 662 "Plate Heat Exchangers for General refinery Services"

IPS (IRANIAN PETROLEUM STANDARD)

[IPS-E-PI-200\(1\)](#) "Engineering Standard for Flexibility Analysis"

NEMA (NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION)

NEMA SM 23 "Steam Turbines for Mechanical Drive Service"

ASCE (AMERICAN SOCIETY OF CIVIL ENGINEERS)

ASCE 7 "Minimum Design Loads for Buildings and other Structures"

NIOEC SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-01 "NIOEC SPECIFICATION FOR CIVIL DESIGN CRITERIA"
 NIOEC-SP-00-10 "NIOEC Specification for Units"
 NIOEC-SP-50-23 "NIOEC Specification for Pipe Supports"

3. UNITS

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

4. CHANGE THE FOLLOWING ARTICLES IN IPS-E-PI-200(1)

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

ARTICLE 5 (MODIFICATION)

The last paragraph shall be modified as follows:

This specification shall be complied with:

- a) NIOEC Specification for Pipe Supports NIOEC-SP-50-23.
- b) Special requirements of rotating equipment, civil, stationary pressure, storage equipment and heat transfer equipment specially with concerning to allowable loads and moments on equipment.

ARTICLE 6.5.2 (MODIFICATION)

The first sentence shall be modified as follows:

Wind loading shall be considered in accordance with NIOEC specification for civil design criteria NIOEC-SP-00-01.

ARTICLE 6.5.3 (MODIFICATION)

The second sentence shall be modified as follows:

The method of analysis shall be as described in NIOEC specification for civil design criteria NIOEC-SP-00-01.

ARTICLE 8.1 (MODIFICATION)

The first paragraph shall be modified as follows:

External forces and moments on nozzles of pressure vessels shall be in compliance with conventional load table, issued by equipment department.

APPENDIX A (MODIFICATION)

The following notes shall be added to end of general chart:

- 10 inch size for design temperature between -30 0C and 50 0°C must be analyzed by LEVEL 2.
- 3 inch size for design temperature between 50 0C and 150 0°C must be analyzed by LEVEL 2.

The following lines shall be added to specific cases:

- Lines with NPS $\geq 2''$ connected to large movement pipe (≥ 40 mm) at branch point. (LEVEL 3)
- Jacketed piping (LEVEL 3)
- Vacuum lines (LEVEL 3)
- Any other line or equipment (e.g. re-boiler connected to tower directly) which needs to have comprehensive calculation recognized by stress analysis engineer. (LEVEL 3)

All cases which comprises any special stress analysis item like spring support, expansion joint, PTFE, rigid strut and shock absorber (LEVEL 3).