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

NIOEC SP

NIOEC SPECIFICATION FOR INSTRUMENT INSTALLATION

SECOND EDITION

DECEMBER 2009

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 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

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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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1. SCOPE

This specification defines NIOEC's requirements of for the installation of the instrumentation. The specification also addresses the work demarcation, special notation, and necessary information for instrumentation construction work.

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)

RP-552	"Transmission systems"
ST 2000	"Venting Atmospheric and Low-Pressure Storage Tanks"
RP 520	"API Recommended Practice for the Design & Installation of Pressure Relieving System in Refineries Part I, Latest Edition & Part II"

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERS)

B2. 1	"Pipe Threads"
B31. 3	"Process Piping"
B16. 5	"Pipe Flanges and Flanged Fittings"
	"Boiler and Pressure Vessel Codes", Sections I and VIII
	"Unfired Pressure Vessel Code", Section VIII, Division I Para's UG-125 through UG-134
	"Boiler and Pressure Vessel Code", P-269 through P-290 MC-96.1
	"Thermocouples and Thermocouple Extension Wire" (Section II)
	"Materials"
	"Boiler and Pressure Vessel Code", Section IX, (for pressure parts).

AWS (AMERICAN WELDING SOCIETY)

AWSD 1.0	"Code for welding in building construction"
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IEC (INTERNATIONAL ELECTRO-TECHNICAL COMMISSION)

ISA (INSTRUMENTATION, SYSTEM, AUTOMATION SOCIETY OF AMERICA)

S 12.1	“Electrical Instruments in hazardous atmospheres”
RP 12.6.1	“Wiring Practices for Hazardous (Classified) Locations Instrumentation”

NIOEC SP (NIOEC SPECIFICATIONS)

NIOEC-SP-70-01	“Specification for Instrumentation”
NIOEC-SP-70-07	“Specification for Control Systems Calibration, Inspection and Tests”
NIOEC-SP-70-13	“Specification for power supply and distribution systems”
NIOEC-SP-70-17	“Specification for Instrument protection”
NIOEC-SP-80-02	“Specification for Painting”
NIOEC-SP-00-10	“Specification for Units”
NIOEC-SP-00-75	“Specification for Pressure Relieving Systems”
NIOEC-SD-0100-1to4	“Standard Drawing for P&ID Symbols and Legends”
NIOEC-SD-0101-1/1	“Standard Drawing for P&ID Abbreviations”
NIOEC-SD-7009	“Standard Drawing for Junction Box and Cable Supports”

3. UNITS

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

4. ABBREVIATIONS

Throughout this document the following abbreviations and acronyms are used:

ESD: Emergency Shutdown.

F&G: Fire and Gas.

PCS: Process Control System.

PVC: Polyvinyl Chloride.

SGS: Safeguarding System.

5. REPRESENTATION & SYMBOLS

The method for representing instruments on piping and instrument flow diagrams and control and utility flow sheets shall be in general accordance with NIOEC standard drawings SD-00-0100-1 To 4 “Standard Drawing for P&ID Symbols and Legends” and SD-00-0101-1/1 “Standard Drawing for P&ID Abbreviations”.

6. GENERAL REQUIREMENTS**6.1. Work Experience**

Where the construction work is to be performed by a contractor, the contractors' and their subcontractors' construction engineers and staff shall be qualified with sufficient relevant

experience. Contractors/subcontractors shall submit to NIOEC or his representative their relevant organization chart for all key personnel prior to the start of the construction work.

Subcontractors' engineers and staff shall have sufficient instrument construction work experience; in this regard the resume and qualification of all subcontractors will be checked and verified by contractor and NIOEC or his representative.

The Contractor shall be responsible for the installation, calibration; test and commissioning of all instruments and control systems during the construction phase.

6.2. Instrument Work Schedule

Contractor shall be responsible to submit to NIOEC relevant work schedules. Any deviation from the agreed work schedule shall be reported to NIOEC for his resolution.

6.3. Instrumentation Monthly Progress Reports

Contractor/subcontractors for each job site are responsible to prepare and submit to NIOEC or his representative relevant instrument and control work monthly progress reports on the agreed date before the end of each month.

6.4. Instrumentation Weekly Meeting

Contractor shall arrange for weekly meetings with the presence of subcontractors and NIOEC or his representative to establish the required coordination amongst all parties.

Amongst the agenda, the following items will be discussed:

- Progress evaluation
- Work discrepancy between each party.
- Manpower survey
- Work schedule survey
- Decisions regarding the work program for the following week

Minutes of meetings will be prepared by contractor and will be sent to all parties, maximum two days after the meeting.

7. INSTRUMENT CALIBRATION

7.1. Test Equipment

7.1.1. The calibration of all test equipment must be checked before being used for any calibration of instruments.

7.1.2. The test equipment calibration check shall be made against NIOEC standards wherever possible. If NIOEC standards are not available, the test equipment shall be sent to an independent testing laboratory for certification

7.1.3. The test instrument calibration check shall be recorded on a label, showing date and person performing check, and attached to the piece of equipment in such a place as to be easily visible, but not easily removable.