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

NIOEC SP

NIOEC SPECIFICATION FOR SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEM (SCADA)

FIRST EDITION

DECEMBER 2017

THIS STANDARD 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.

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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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0	DECEMBER 2017	A. MOGHADAM	G.R. MOHSENI	M.R. FARZAM	M. KARGARNAJAFI
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1. SCOPE

This specification defines NIOEC's minimum requirements for a Supervisory Control and Data Acquisition (SCADA) system.

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 STD 1164	"Pipeline SCADA Security"
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EN (EUROPEAN STANDARDS)

EN 55022	"Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement"
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EU (EUROPEAN UNION)

EMC- Directive 2014/30/EU	"European Union EMC Directive"
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IEC (INTERNATIONAL ELECTRO-TECHNICAL COMMISSION)

IEC 61000-4	"Electromagnetic Compatibility (EMC)"
IEC 61499-1	"Function Blocks- Part 1: Architecture"
IEC 61499-2	"Function Blocks- Part 2: Software Tool Requirements"
IEC 61158-2	"Industrial Communication Networks- Field bus Specification, Part 2: Physical Layer Specification and Service Definition"
IEC 61131-3	"Programmable Controllers- Part 3: Programming Language"
IEC 60332	"Test On Electric and Optical Fibre Cables under Fire Conditions"
IEC 60529	"Degree of Protection Provided By Enclosures (IP Code)"
IEC 60068	"Basic Environmental Testing Procedures"
IEC 60605	"Equipment Reliability Testing"
IEC TR 62380	"Reliability Data Handbook– Universal Model for Reliability Prediction of Electronics Components, PCBs and Equipment"

IEEE (INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS)

IEEE C37.90.1	“Surge Withstand Capability (SWC) Tests for Relays and Relay System Associated With Electric Power Apparatus”
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ISA (INSTRUMENTATION, SYSTEM, AUTOMATION SOCIETY OF AMERICA)

ISA 5.1	“Instrument Symbols and Identifications”
ISA 5.2	“Binary Logic Diagrams For Process Operations”
ISA 5.3	“Graphic Symbols For Distributed Control/Shared Display Instrumentation, Logic and Computer Systems”
ISA 5.4	“Instrument Loop Diagrams”
ISA 18.1	“Annunciator Sequences and Specification”

ISO (INTERNATIONAL STANDARD ORGANISATION)

ISO 9000	“Quality Management Systems”
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NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)

NFPA 70	“National Electrical Code”
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NIOEC SP (NIOEC SPECIFICATIONS)

NIOEC-SP-70-01	“Specification for Instrumentation”
NIOEC-SP-70-21	“Specification for Programmable Logic Controllers (PLC)”
NIOEC-SP-00-10	“Specification for Units”
NIOEC-SP-70-05	“Specification for Instrumentation Control Cables, Cable Trays, Conduits, Junction Boxes And Cable Glands”
NIOEC-SP-70-54	“Specification for Telecommunication Cables”

TIA (TELECOMMUNICATION INDUSTRY ASSOCIATION)

TIA -485	“Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems”
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U.S. MIL HDBK (U.S. MILITARY HANDBOOK)

MIL-HDBK-217	“Reliability Prediction of Electronic Equipment”
MIL-HDBK-472	“Maintainability Prediction”

3. UNITS

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