

NIOEC-SP-70-19(1)							
DOCUMENT CODE							NO. OF PAGES: 20
PLAN/PRJ/SUB	UNIT	PHASE	DISCIPLINE	DOCUMENT TYPE	SERIAL NO.	REV. NO.	DATE
NIOEC	000	EG	IN	SP	7019	A1	FEBRUARY, 2007



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

NIOEC SP

NIOEC SPECIFICATION FOR MISCELLANEOUS INSTRUMENTS

FIRST EDITION

JULY, 2005

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IN THE NAME OF GOD**FOREWORD**

By their very nature, technical standard 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 standard 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 standard 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 Division of the Engineering and Construction 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 Division of the Engineering and Construction 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 Deputy of the Engineering and Construction Director of NIOEC for evaluation and consideration.

S. R. KASAEIZADEH



EXECUTIVE DIRECTOR

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NOTES:

- 1) THIS SHEET IS A RECORD OF ALL REVISIONS TO THIS SPECIFICATION.
- 2) REMARKS RELATED TO EACH REVISION SHOW A BRIEF DESCRIPTION. THESE REMARKS SHALL BE INTERPRETED IN CONJUNCTION WITH THE REVISED TEXT MARKED BY REVISION NUMBERS.
- 3) WHEN APPROVED EACH REVISION SHALL BE CONSIDERED AS A PART OF THE ORIGINAL DOCUMENT.
- 4) NUMBER OF PAGES EXCLUDES THIS SHEET AND THE COVER SHEET.

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1. SCOPE

This specification defines NIOEC'S minimum requirements for miscellaneous instrumentation supplied with:

- Packaged Equipment Instrumentation,
- Rotating Machinery Instrumentation,
- Flare System Instrumentation.

Deviations from this specification will only be permitted on obtaining written approval from NIOEC.

2. REFERENCES

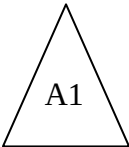
Throughout this specification the following dated and undated standards and codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this specification.

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 the dated references that occur after the cited date shall be mutually agreed upon by NIOEC and the vendor /contractor.

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

API (AMERICAN PETROLEUM INSTITUTE)



RP 500 A/B/C	"Classification of Areas for Electrical Installation in Refineries/Pipeline/Offshore Platforms"
RP 521	"Guide for Pressure Relieving and Depressuring System"
RP 551	"Process Measurement Instrumentation"
RP 552	"Transmission Systems"
RP 553	"Refinery Control Valves"
RP 554	"Process Instrumentation and Control"
Std. 678	"Accelerometer-Based Vibration Monitoring Systems" (1981)
Std. 670	"Vibration, Axial-position, and Bearing-Temperature Monitoring Systems" (2003)
Std. 678	"Accelerometer-Based Vibration Monitoring System" (1981)

BSI (BRITISH STANDARDS INSTITUTION)

BS 5345	"Code of Practice for Selection, Installation and Maintenance of Electrical Apparatus for Use in Potentially Explosive Atmosphere (Other than Mining Applications or Explosive Processing and Manufacturing)"
BS 4683	"Specification for Electrical Apparatus for Explosive Atmosphere" (1971)

Part 1

BS 4683 "The Construction and Testing of Flame-Proof Enclosures of Electrical

Part 2 "Apparatus" (1971)

CENELEC (EUROPEAN COMMITTEE FOR STANDARDIZATION OF ELECTROTECHNIQUE)

EN 50.014 "General Requirements"

EN 50.016 "Pressurized Apparatus 'p'"

EN 50.018 "Flame-Proof Enclosure 'd'"

EN 50.020 "Intrinsic Safety 'i'"

EN 50.039 "Systems"

IEC (INTERNATIONAL ELECTRO TECHNICAL COMMISSION)

60529 "Enclosure Protection Classification".

ISA (INSTRUMENT SOCIETY OF AMERICA)

S 5.1 "Instrumentation Symbols and Identification"

S 5.3 "Graphic Symbols for Distributed Control/Shared Display Instrumentation, Logic and Computer Systems"

S 5.4 "Instrument Loop Diagrams"

S 7.3 "Quality Standard for Instrument Air"

S 12.4 "Instrument Purging for Reduction of Hazardous Area Classification"

RP 12.6 "Installation of Intrinsically Safe Instrument Systems in Class 1 Hazardous Locations"

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)

NFC # 496 "Purged and Pressurized Enclosures for Electrical Equipment in Hazardous Locations" (1982)

NFC # 497 A "Classification of Class 1 Hazardous (Classified) Locations for Electrical Installation Area" (1986)

NFC # 70 "National Electrical Code (NEC)"

NIOEC-SP (NIOEC SPECIFICATIONS)

[NIOEC-SP-70-01](#) "Specification for Instrumentation"

[NIOEC-SP-00-10](#) "Specification for Units"

UL (UNDERWRITER LABORATORY)

UL-913 "Intrinsically Safe Apparatus and Associated Apparatus, for Use in

3. UNITS

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

4. DEFINITIONS

4.1 Purchaser

In cases where this specification is part of a direct order, Purchaser shall mean National Iranian Oil Engineering and Construction NIOEC. Where this specification forms part of contract documents, purchaser shall mean contractor. In references to inspection by purchaser when this specification forms part of contract documents this shall be construed to mean that NIOEC shall also have the right of inspection.

4.2 Packaged Unit

"Packaged Unit" is defined as a prefabricated process or utility unit, which could operate in isolation.

4.3 Instrument or Instrument Systems for Packaged Units

- Defined as those instruments or instrument systems necessary to build the packaged unit, as provided by the manufacturer of the unit;
- May also include NIOEC's provided instruments, which are those instruments or instrument systems necessary to build the packaged unit supplied free of charge to the equipment package manufacturer by, or on behalf of, the NIOEC.

4.3 Functional Tests

Defined as tests carried out by simulating a process condition on the input side of the instrument to check the corresponding output 'function'. The conditions should be such that the required accuracy can be obtained.

Note:

All test equipment for this purpose shall be made available by the manufacturer/supplier.

4.4 "Loops" in the Packaged Equipment

- Local control loops including local control panels or local receivers;
- Remote control loops, are control loops linked to the main control room through junction boxes installed inside the packaged equipment. The primary element, final control element (control valve) and the transmitter are mounted inside the package, only the receiver/controller is located in the main control room.

4.5 Installation Materials for Packaged Equipment Instrumentation

Are miscellaneous items of material required for the installation of instruments in the packaged equipment such as tubing, fittings, cables, etc.