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

NIOEC SP

NIOEC SPECIFICATION FOR CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

FIRST EDITION

JANUARY, 2007

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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 the design, manufacture, test and inspection of monitoring closed circuit television systems (CCTV).

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.

BASEEFA	(BRITISH APPROVALS SERVICE FOR ELECTRICAL EQUIPMENT FOR FLAMMABLE ATMOSPHERES)	
CENELEC	(COMITÉ EUROPÉEN DE NORMALISATION ELECTROTECHNIQUE)	
EEC	(EUROPEAN ECONOMIC COMMUNITY)	
	EMC- Directive 89/336/EEC	“Electromagnetic Compatibility”
EN	(EUROPEAN STANDARDS)	
	EN 55022	“Specification For Limits And Measurement Of Radio Interference Characteristics Of Information Technology Equipment”
FM	(FACTORY MUTUAL)	
IEEE	(INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS)	
	IEEE C37.90.1:	“Surge Withstand Capability (SWC) Tests”
IEC	(INTERNATIONAL ELECTRO-TECHNICAL COMMISSION)	
	IEC 60751	“Industrial Platinum Resistance Thermometer Sensors”
	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4	“Electromagnetic Compatibility (EMC)”
	IEC 60332	“Test On Electric Cables Under Fire Conditions”
	IEC 60529	“Classification Of Degree Of Protection

		Provided By Enclosures"
	IEC 60068	"Basic Environmental Testing Procedures"
	IEC-60-605:	"Equipment Reliability Testing"
ISO	(INTERNATIONAL STANDARD ORGANISATION)	
	ISO 9000	"Quality Systems"
	ISO/IEC 14496	
	MPEG 4	
	" Motion Picture Experts Group 4 (Standard - Compressed Video at 64 Kbps)"	
LCIE	(LABORATORIE CENTRAL DES INDUSTRIES ELECTRIQUES)	
NFPA	(NATIONAL FIRE PROTECTION ASSOCIATION)	
	NFPA 70	"National Electrical Code"
NIOEC SP	(NIOEC SPECIFICATIONS)	
	NIOEC-SP-00-10	"Specification For Units"
PTB	(PHYSIKALISCH TECHNISCHE BUNDESANSTALT)	
TIA	(TELECOMMUNICATION INDUSTRY ASSOCIATION)	
	TIA/EIA-485	"Electrical Characteristics Of Generators And Receivers For Use In Balanced Digital Multipoint Systems"
U.S. Military HNBK	U.S. MILITARY HANDBOOK	
U.S. Military Handbook -217	U.S. Military Handbook -217	"Reliability Prediction Of Electronic Equipment"
U.S. Military Handbook -472	U.S. Military Handbook -472	"Maintainability Prediction"
UL	(UNDERWRITERS' LABORATORIES)	

3. UNITS

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

4. DEFINITIONS AND TERMINOLOGY

Purchaser: In cases where this specification is part of a direct order, Purchaser shall mean the National Iranian Oil Engineering and Construction Company. Where this specification forms part of contract documents, Purchaser shall mean the 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.

5. ABBREVIATIONS

CCD: CHARGE COUPLE DEVICES

CCTV: CLOSED CIRCUIT TELEVISION SYSTEM

CIF: COMMONINTERMEDIA FROMAT

FAT: FACTORY ACCEPTANCE TEST

FPS: FRAME PER SECOND

IP: INTERNET PROTOCOL

NAS: NETWORK ATTACHED SERVER

NVR: NETWORK VIDEO RECORDER

RAID: REDUNDANT ARRAY OF INEXPENSIVE DISKS

SAT: SITE ACCEPTANCE TEST

UPS: UNINTERRUPTIBLE POWER SUPPLY

6. PRODUCT HISTORY

The system shall be of the same model and design as used in similar plants and operating/ambient conditions with at least three (3) years of satisfactory operational history.

7. CERTIFICATION AND APPROVALS

The system shall bear CE marking in accordance with EMC- Directive 89/336/EEC, and the conformity certificates shall be provided. OEM of Cameras, Encoders, Decoders, NVR, Servers, NAS box/Raid backup device, Workstations, Monitors, and Switches shall be ISO firms & the offered products must be CE certified.

The VENDOR shall also submit certificates/records of type test approval of the system, based on recognised national or international standards, which for CENLEC regulations shall be LCIE, TUV, PTB, BASEEFA and for NEC regulations shall be FM or UL.

8. GENERAL REQUIREMENTS

8.1 Environmental Data

Indoor temperature and humidity (RH) will be $22\text{ }^{\circ}\text{C} \pm 4^{\circ}\text{C}$ and 40% to 70% respectively and shipping and storage conditions will be considered as $-20\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$ and 0% to 100%.

All the indoor cameras & control equipment shall be suitable for operation from 100 C to 400 C and relative humidity up to 80 % non-condensing. Cameras & other equipment, meant for outdoor installations, shall be suitable to work from -20 C to +50 C with RH up to 90% non-condensing. This temperature range may be achieved with or without heater.

Allowable indoor noise level shall be 55 dBA, measured at one meter from equipment in question.

Outdoor temperature and humidity (RH) will be -20 °C to 50°C and 40% to 70% respectively.

Outdoor atmosphere will have suspended solids, dust and sand.

8.2 Electrical Power Supply

8.2.1 Electrical power supplies will be available to the system by others as follows:

- UPS supply - 230 V AC (± 5 %), 50 Hz (± 1 %)
- Non-UPS supply - 230 V AC (± 10 %), 50 Hz (± 5 %)

8.2.2 Vendor shall supply all relevant voltage converters required for the CCTV system operation.

8.2.3 UPS Power feeders will be provided to CCTV cabinets, individual monitors and individual cameras in the field. Suitable terminals shall be provided for the termination of cables, and shall be sized for minimum 4 mm². Vendor shall confirm the feeder size from Contractor during detailed engineering.

8.2.4 Vendor shall specify the power supplies required to each rack or item of equipment in terms of maximum power consumption and diversity factor that could be applied for sizing the total capacity.

8.3 Ingress Protection and Hazardous Area Classification

Indoor stations, camera housing, and system cabinets shall conform to IEC-60529, IP 42, as a minimum.

Outdoor equipment, including camera housing, shall conform to IEC-60529, IP 66, as a minimum. In addition electrical accessories, cabling, enclosures and junction boxes in hazardous areas will be explosion proof suitable for NEC Class I, Division I, and Group C (IEC Zone I, Group II B) locations.

8.4 Electromagnetic Interference

Equipment shall meet all electromagnetic compatibility requirements of the IEC 61000-4-2, 61000-4-3, and 61000-4-4 standards.

Each element of the system must function without introducing intolerable electromagnetic disturbances to other items or being susceptible to electromagnetic influences from other systems.

Emission limits generally comply with the relevant requirements of BS-6527 for Class B equipment, and Susceptibility performance shall generally comply with the relevant requirements of IEC 1000-4. All equipment comprising the system shall be designed in such a way as to ensure immunity to interference from VHF and UHF hand portable transceivers operating in the range 150 MHz to 470 MHz with a power output of 1 Watt (RMS) held at 300 mm from any equipment forming part of the system.

9. TECHNICAL SPECIFICATIONS

9.1. General

9.1.1. CCTV system shall ensure effective monitoring of the intended plant areas as well as create a tamperproof record for post event analysis. The System shall provide an online display of video images on LCD monitors located in control room(s).