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

NIOEC SP

NIOEC SPECIFICATION FOR FIRE FIGHTING EQUIPMENT AND FACILITIES

FIRST EDITION

OCTOBER, 2006

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 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

REVISION INDEX

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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

- 1.1** This Specification covers the design basis of fire fighting facilities and fixed equipment to be employed for the prevention, control and extinguishing of Refinery fires, it does not cover fire resistant construction, insulation or fireproofing, trenching or fire-walling, electric bonding or earthing, or general regulations affecting personnel or equipment.
- 1.2** Interchangeability of equipment within Refineries shall be a primary consideration.
- 1.3** An approved altering and communicating system is required with fire detector systems for special risks.

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 the company and the Vendor/Contractor.

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERING)

ASME B16.5 “Steel pipe flanges and flange fittings”

NIOEC-SP (NIOEC SPECIFICATIONS)

NIOEC-SP-00-10	“NIOEC Specification for Units”
NIOEC-SP-00-66	“NIOEC Specification for Liquid & Gas Transfer & Storage”
NIOEC-SP-46-16	“NIOEC Specification for Fire Water Pumps”
NIOEC-SP-47-32	“NIOEC Specification for Co2 Extinguishing System”
NIOEC-SP-50-01	“NIOEC Specification for General Piping, Process and Utility Design, Equipment Layout and Drawing Procedure”
NIOEC-SP-90-52	“NIOEC Specification for packing and packages”

NIOEC-SD (NIOEC STANDARD DRAWINGS)

[NIOEC-SD- 5013-1/1](#) “Standard DWG Underground & Misc. Piping Details”

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION CODES)

Code No. 10	“Fire Extinguishers, Portable”
Code No. 11	“Low Expansion Foam and Combined Agent Systems”
Code No. 12	“Carbon Dioxide Extinguishing System”
Code No. 14	“Standpipe Private Hydrant and Hose Systems”
Code No. 15	“Water spray Fixed Systems for Fire Protection”
Code No. 20	“Fire Pumps, Centrifugal”
Code No. 24	“Private Fire Service Mains and their Appurtenances”

BRITISH STANDARD

BS – 336

“Specification for fire hose couplings and ancillary equipment”

3. UNITS

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

4. DEFINITIONS AND TERMINOLOGY

4.1 Company: Means National Iranian Oil Engineering & Construction Company.

4.2 Purchaser: Means National Iranian Oil Engineering and Construction Company in cases where this Specification is part of direct order by NIOEC and contractor where this Specification is part of contract Documents.

5. DESCRIPTION OF SYSTEMS

5.1 The philosophy adopted in the design of fire fighting facilities shall be that Fire Fighting facilities shall be sized adequately and designed for fighting two major fires simultaneously occurring in the refinery and/or tankage area.

Fire fighting activities may be carried out on the burning facility using monitors, hose reels, hydrant nozzles, foam system, fire water, CO₂ system, portable fire extinguishers, steam extinguishing means, mobile fire fighting equipment (fire trucks), etc.

The following fire protection systems shall be provided for the project.

- Fire water storage and fire water pumping/distribution systems (including outdoor water hydrants, fixed and portable water monitors and outdoor/indoor hose reels).
- Semi – fixed foam extinguishing system complete with CF3I ream seal protection system (sub-surface and top pouring foam extinguishing system) for tanks containing flammable liquids.
- Fixed water cooling system for tanks containing hydrocarbons.
- Fixed water spray system for LPG spheres, bullets and large separators containing light oils likely to cause BLEVE (Boiling Liquid Expanded Vapor Explosion).
- CO₂ extinguishing system for substations and Gas Turbine Generators. CO₂ extinguishing system shall also be provided for “Battery Room” of substation .Where under floor cable void is provided, CO₂ distribution piping shall be extended to the cable void, no fire detectors are required in the cable voids but CO₂ extraction fan is required. For Remote Instrument Buildings (RIB) the same philosophy of substations should be applied.
- Steam extinguishing system (Snuffing steam)
- Fire extinguishers
- Fire training area including all facilities and connections