Model code of safe practice

Part 1

The selection, installation, inspection and maintenance of electrical and non-electrical apparatus in hazardous areas

9th edition

energy institute

EI MODEL CODE OF SAFE PRACTICE

PART 1: THE SELECTION, INSTALLATION, INSPECTION, AND MAINTENANCE OF ELECTRICAL AND NON-ELECTRICAL APPARATUS IN HAZARDOUS AREAS

Ninth edition

July 2019

Published by
Energy Institute, London
The Energy Institute is a professional membership body incorporated by Royal Charter 2003
Registered charity number 1097899

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This publication has been produced as a result of work carried out within the Technical Team of the EI, funded by the EI's Technical Partners. The EI's Technical Work Programme provides industry with cost-effective, value-adding knowledge on key current and future issues affecting those operating in the energy sector, both in the UK and internationally.

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The EI gratefully acknowledges the financial contributions towards the scientific and technical programme from the following companies

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BP Oil UK Ltd
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Chrysaor
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ConocoPhillips Ltd
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Tullow Oil
Uniper
Valero
Vattenfall
Vitol Energy
Woodside
World Fuel Services

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ISBN 978 1 78725 085 7

Published by the Energy Institute

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CONTENTS

Contents continued

Contents continued

Contents continued

LIST OF FIGURES AND TABLES

Page

Figures

Tables

FOREWORD

This model code of safe practice (MCoSP) provides guidance on the selection, installation, inspection and maintenance of electrical and non-electrical equipment and systems in the energy industry in areas identified as hazardous using the methodology in Energy Institute (EI) *Model code of safe practice Part 15: Area classification code for installations handling flammable fluids* (EI 15). It covers hydrocarbon processing, storage and distribution facilities. It provides a summary of the main technical and UK legal issues which equipment users need to address. It also discusses sources of ignition in apparatus other than explosion-protected equipment.

This MCoSP provides references to the relevant standards which provide greater detail on each individual topic. It is recognised that standards published by the International Electrotechnical Commission (IEC) are increasingly being used as the basis for a common approach to standardisation worldwide, and developed and offered for European Union (EU) adoption as Euronorms (EN). Differences may exist between an IEC standard and the corresponding EN standard, but the differences are often minor, if any. It is intended that technical aspects of this model code be applicable Europe-wide and internationally, as well as in the UK, but this code refers specifically to the UK legal position, though the legal position in EU countries should be similar for issues governed by EU Directives. For these reasons, EU harmonised EN standards are given as the definitive references for explosion-protected apparatus and its application; elsewhere, IEC standards are given as primary references. Where no EN standard or IEC standard exists, British standards (BS), industry guidance, or published papers are referenced. A full listing of standards referenced in this model code is included in Annex H.

The definitions included in Annex A are taken from EN or IEC standards where applicable, but in some instances the text has been clarified. The modified definitions apply to this publication only.

With respect to the eighth edition, the ninth edition of this model code contains new and additional guidance on the following topics:

- earthing/grounding/bonding in the oil and gas industry;
- above ground storage tanks;
- arc flash risk to personnel working in hazardous environments;
- testing underground electric cables in hazardous environments, and
- ignition threats posed by self-powered electronic devices.

The information contained in this publication is provided as guidance only, and while every reasonable care has been taken to ensure the accuracy of its contents, the EI and the technical representatives listed in the Acknowledgements, cannot accept any responsibility for any action taken, or not taken, on the basis of this information. The EI shall not be liable to any person for any loss or damage which may arise from the use of any of the information contained in any of its publications.

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Suggested revisions are invited and should be submitted to the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR, technical@energyinst.org

ACKNOWLEDGEMENTS

This publication was prepared at the request of the EI Electrical Committee by Bob Dean (RINA Consulting). It was subsequently reviewed and developed by the members of the Electrical Committee, at the time of publication comprising:

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Lee Sinfield	The Oil and Pipelines Agency Limited
Stephen Wilkinson	Phillips 66 Limited
Graeme Wilson	Chrysaor
Agshin Yusifzada	Shell

The EI wishes to record its appreciation of the work carried out by the members of the Electrical Committee and to recognise the contribution made by those individuals, companies and organisations that provided comments during technical review.

The EI also gratefully acknowledges the support and assistance given by the Health and Safety Executive (HSE) in the preparation and revision of this model code.

Technical editing and project coordination were undertaken by Toni Needham (EI).

1 INTRODUCTION AND SCOPE

This MCoSP is aimed at providing an overview of the particular issues related to the selection, installation, inspection and maintenance of explosion-protected Ex certified electrical and non-electrical apparatus in the energy industry, specifically in areas where there is a possibility of occurrence of a flammable atmosphere. Guidance is given on the selection of such apparatus, together with installation, inspection and maintenance practices. Where more detailed guidance on specific topics exists, the relevant references are provided.

It also addresses earthing and bonding of electrical and non-electrical apparatus, and its associated cabling and support structures, in order to provide protection against electric shock, and against ignition hazards from apparatus which is not explosion-protected, electrostatic discharge, and also lightning protection in hazardous areas. Ignition sources are addressed, including apparatus which is not explosion-protected and the ignition hazards associated with circulating stray currents and cathodic protection systems, as are the hazards associated with temporary electrical supplies.

It is applicable to both onshore and offshore facilities. It is not applicable to mines, areas where explosives are manufactured, stored or handled and areas subject to flammable dusts and similar materials such as flammable fibres. It is closely associated with EI 15.

The issues associated with ignition of flammable atmospheres by non-electrical sources such as hot surfaces are also discussed within this model code.