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IEEE Guide for Specifying and Selecting Power, Control, and Special-Purpose Cable for Petroleum and Chemical Plants

IEEE Industry Applications Society

Sponsored by the
Petroleum and Chemical Industry Committee

and the

IEEE Power and Energy Society

Sponsored by the
Insulated Conductors Committee

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Abstract: Information on the specification and selection of power, control, and special-purpose cable, as typically used in petroleum, chemical, and similar plants, is provided in this guide. Materials, design, testing, and applications are addressed. More recent developments, such as strand filling, low smoke, zero-halogen materials, chemical-moisture barriers, and fire-resistive cables have been included.

Keywords: cable insulation, data communications cable, emergency isolation valves, fiber optic, fire-resistive cable, IEEE 1242™, LSZH/XLLSZH cable, low-voltage cable, medium voltage cable, motor-operated valves, non-metallic armor, remote-operated shut-off valves

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Introduction

This introduction is not part of IEEE Std 1242-2016, IEEE Guide for Specifying and Selecting Power, Control, and Special-Purpose Cable for Petroleum and Chemical Plants.

This guide was originally prepared by Working Group P1242 of the Petroleum and Chemical Industry Committee (PCIC) of the IEEE Industrial Applications Society with joint membership coordination from Project 9-39 of the Special Purpose Cable Subcommittee (No. 9) of the Insulated Conductor Committee (ICC) of the IEEE Power Engineering Society. The guide has been jointly revised by the Working Group at PCIC and Working Group D03W of Subcommittee D of the Insulated Conductor Committee (ICC) of the IEEE Power and Energy Society. This working group fulfilled a unique role by linking the user community represented by the PCIC membership with the cable manufacturing, utility, and consulting community represented by the ICC. Joint membership provided for ease of input to the guide and cable design solutions that could only have been accomplished in this manner. The purpose of this guide is to provide the user with current cable technology in order to specify and select power, control, and special purpose cable for use in the petroleum and chemical industry. Emphasis is placed on those areas of concern peculiar to these industries, including such environmental effects as chemical atmospheres, hazardous areas, contamination, corrosion, and fire. This guide also may be applicable to other industries such as the utility power generation where similar cables are used under similar environments.

This revision to the guide was prepared by the joint PCIC/ICC Working Groups for the purpose of updating the guide to include new technology changes since its original issue.

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IEEE Guide for Specifying and Selecting Power, Control, and Special-Purpose Cable for Petroleum and Chemical Plants

1. Overview

1.1 Scope

This guide provides information on the specification and selection of power, control, and special-purpose cable, as typically used in petroleum, chemical, and similar plants. It addresses materials, design, testing, installations, and applications. More recent developments such as fire-resistive circuit integrity cables have been included. This guide is not intended to be a design document, although many of the problems associated with the specification and selection of power, control, and special-purpose cable for petroleum and chemical plant applications can be avoided by considering the information presented in this guide. It is recognized that there may be other types of cable used in the petroleum and chemical industries, especially considering the global marketplace. This guide should not be interpreted as precluding the use of such cables.

1.2 Purpose

The purpose of this guide is to provide the user with cable designs, applications, and test procedures that are common to the petroleum, chemical, or similar type of industry. It is intended as an informational tool for the new as well as the more seasoned engineer. In this capacity, it contains an extensive single-point