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IEEE Guide for Containment and Control of Oil Spills in Substations

Sponsor

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IEEE Power Engineering Society

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Abstract: *The significance of oil-spillage regulations and their applicability to electric supply substations are discussed; the sources of oil spills are identified; typical designs and methods for dealing with oil containment and control of oil spills are discussed; and guidelines for preparation of a typical Spill Prevention Control and Countermeasures (SPCC) plan are provided. This guide excludes polychlorinated biphenyl (PCB) handling and disposal considerations.*
Keywords: *collecting pit, oil-containment methods, oil-containment system, oil discharge, oil spill, primary oil containment, retention pit, secondary oil containment, spill prevention control and countermeasures (SPCC) plan*

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Introduction

(This introduction is not a part of IEEE Std 980-1994, IEEE Guide for Containment and Control of Oil Spills in Substations.)

On December 31, 1973, the United States government published in its Code of Federal Regulations, under Title 40 Protection of the Environment, the federal requirements for the preparation and implementation of Spill Prevention Control and Countermeasure (SPCC) plans applicable to the discharge of oil at electrical facilities. While these regulations, in the strictest sense, relate to oil spills into navigable waters from shore facilities, it should be realized that these regulations could very easily be, and in some states are, extended to cover onshore areas. Onshore areas could be a distance away from navigable waters and could include those areas where substations are installed.

It is prudent, therefore, to recognize that there exists a potential for oil spills in almost every substation throughout the utility industry. It is consequently reasonable to identify the extent of the problem, if any, and to recommend plausible measures to control oil spills by means of an IEEE guide.

This guide was revised by members of Working Group G2—Design and Location of Substations for Community Acceptance—and is under the sponsorship of the Substations Environmental Subcommittee of the IEEE Power Engineering Society (PES) Substations Committee.

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1. Overview

1.1 Scope

This guide discusses the significance of oil-spillage regulations and their applicability to electric supply substations; identifies the sources of oil spills; discusses typical designs and methods for dealing with oil containment and control of oil spills; and provides guidelines for preparation of a typical Spill Prevention Control and Countermeasure (SPCC) plan. This guide excludes polychlorinated biphenyl (PCB) handling and disposal considerations.

It is not the intent of this guide to interpret the applicability of the governmental regulations or the oil-containment systems presented. Such interpretation is left to each individual user. The guide is intended to identify concerns, offer solutions, and let users make their own evaluations.

This guide applies only to insulating oil containing less than 50 ppm of PCB, which is considered to be non-PCB oil. Non-PCB oils have a PCB content that has been designated by the U.S. Environmental Protection Agency (EPA) as nonhazardous to the public, and they are not deemed to be toxic substances. While the effectiveness of the containment methods described in this guide is generally not affected by the PCB content of the oil, the regulations governing cleanup and handling of oil spills containing PCB are much more restrictive.

1.2 Purpose

Containment and control of oil spills at electric supply substations is a concern for most electric utilities. The environmental impact of oil spills and their cleanup is governed by several federal, state, and local regulations, necessitating increased attention in substations to the need for secondary oil containment, and an SPCC plan. Beyond the threat to the environment, cleanup costs associated with oil spills continue to escalate, and the adverse community response to any spill is becoming increasingly unacceptable.

This guide identifies the applicable governmental regulations, the sources of oil spills, and the typical methods used to contain and control them. It discusses the need for an SPCC plan and provides the typical plan requirements. It documents survey-reported considerations for oil-spill containment, control, and cleanup; the methods used; and their effectiveness. In June 1992 an IEEE questionnaire was sent to 190 utilities in the U.S. and Canada, surveying their experiences. Of these utilities, 59 responded. Where relevant, the survey results are referenced in the body of this guide.