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IEEE Guide for Installation, Maintenance, and Operation of Irrigation Equipment Located Near or Under Power Lines

IEEE Power and Energy Society

Sponsored by the
Transmission and Distribution Committee

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USA

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Abstract: Industry practices and guidelines for installation, maintenance, and operation of irrigation equipment near or under power lines as they pertain to minimum distance to energized conductors and proper grounding to help minimize nuisance shocks are presented in this guide. A variety of conditions in general terms is covered in this guide. Specific recommendations are made for the type of irrigation systems and power line parameters most commonly found.

Keywords: farm irrigation systems, IEEE 1542™, irrigation, irrigation systems, sprinklers

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Introduction

This introduction is not part of IEEE Std 1542-2018, IEEE Guide for Installation, Maintenance, and Operation of Irrigation Equipment Located Near or Under Power Lines.

The guide is intended for designers, installers, and operators of the irrigation equipment, as well as electric power utilities whose lines are located near or above the irrigation systems. General information is provided on installation, maintenance, and operation of irrigation equipment as it relates to safety due to the presence of electric power lines. The following parameters are considered:

a) Distance to energized conductors during installation

b) Proper grounding to help minimize nuisance shocks

c) Distance between irrigation nozzle and power line conductors during operation of the irrigation system

The recommended minimum conductor-to-nozzle distance is based on the maximum allowable body leakage current of 5 mA rms and field tests conducted by the Nebraska Public Power District and the USDA Agricultural Research Service, University of Nebraska.

Because of the great variety of conditions, practices, electrical system designs, types of irrigation systems, water conductivity, and ground resistance values, this guide covers these variables only in general terms. However, specific recommendations are made for the type of irrigation system and power line parameters that are most representative in the industry. The IEEE makes no representation or warranty as to the adequacy or accuracy of the information in this guide or as to economy, or safety issues associated with the use of this guide. When determining whether or not, and/or how, to use the information in this guide, all factors shall be considered with regard to the specific situation(s).

This material is intended to provide a helpful reference for those seeking information on common industry practices so they may consider the experience of others in developing or modifying their own practices.

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IEEE Guide for Installation, Maintenance, and Operation of Irrigation Equipment Located Near or Under Power Lines

1. Overview

1.1 Scope

The guide is based on industry practices and presents guidelines for installation, maintenance, and operation of above ground irrigation equipment near or under power lines as they pertain to minimum distance to energized conductors and proper grounding to help minimize nuisance shocks. The guide covers a variety of conditions in general terms. Specific recommendations are made for the type of irrigation systems and power line parameters most commonly found. This guide does not cover transferred potentials and currents.

1.2 Purpose

The guide is intended for designers, installers, and operators of the irrigation equipment, as well as electric power utilities whose lines are located near or above the irrigation systems. General information is provided on installation, maintenance, and operation of irrigation equipment as it relates to safety due to the presence of electric power lines. The following parameters are considered:

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Because of the great variety of conditions, practices, electrical system designs, types of irrigation systems, water conductivity, and ground-resistance values, this guide covers these variables only in general terms. However, specific recommendations are made for the type of irrigation system and power line parameters that are most representative in the industry. The IEEE makes no representation or warranty as to the adequacy or accuracy of the information in this guide or as to economy, or safety issues associated with the use of this guide. When determining whether or not, and/or how, to use the information in this guide, all factors shall be considered with regard to the specific situation(s).

[1]The numbers in brackets correspond to those of the bibliography in Annex D.