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IEEE Recommended Practice for Nuclear Power Generating Station Preferred Power Supply Reliability

IEEE Power and Energy Society

Sponsored by the
Nuclear Power Engineering Committee

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IEEE Std 1792™-2017
(Revision of IEEE Std 1792-2011)

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Abstract: Activities related to preferred power supply (PPS) reliability, including design considerations, analytical studies, operational and maintenance considerations, and interface agreements between a nuclear power generating station (NPGS) and its associated Transmission Entities are addressed in this recommended practice.

Keywords: Class 1E, IEEE 1792™, interface agreement, NPGS, nuclear power generating station, offsite power, preferred power supply (PPS), reliability, switchyard, transmission system

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Introduction

This introduction is not part of IEEE Std 1792-2017, IEEE Recommended Practice for Nuclear Power Generating Station Preferred Power Supply Reliability.

This document provides a recommended practice to enhance reliability in the application of the preferred power supply (PPS), as described in IEEE Std 765™.[1]

PPS reliability is a complex and multifaceted issue made even more so by electric utility deregulation. Additional complexity has been introduced with creation of multiple Transmission Entities, which have replaced the traditional vertically integrated electric utilities. The relationship between a nuclear power generating station (NPGS) and its associated Transmission Entities extends beyond day-to-day operations and must also include effective communications and coordination of activities to ensure that the PPS and supporting transmission system provide acceptable power quality for the various NPGS operating and shutdown modes as well as design basis accidents.

The document was created to expand upon the annexes originally included in IEEE Std 765, which detailed the guidelines for PPS reliability and transmission system studies (TSSs). This expansion includes recommendations for design considerations, analytical studies, operational and maintenance considerations, as well as interface agreements (IAs) between the NPGS and its associated Transmission Entities.

This revision incorporates enhancements based on initial ballot comments.

[1]Information on references can be found in Clause 2.

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IEEE Recommended Practice for Nuclear Power Generating Station Preferred Power Supply Reliability

1. Overview

1.1 General

This document details important facets of the relationship that should exist between a nuclear power generating station (NPGS) and its associated Transmission Entities to enhance the reliability of the preferred power supply (PPS). This includes analytic tools and approaches used to ensure adequate offsite power is supplied by the PPS and the supporting transmission system. This also includes PPS design considerations as well as operational and maintenance activities associated with both the NPGS and the transmission system.

In the era of electric utility deregulation, achieving and retaining a strong working relationship between an NPGS and its Transmission Entities are dependent upon the existence of a comprehensive interface agreement (IA). This recommended practice offers a framework (template) for such agreements along with a discussion of what should be considered when developing specific IAs.

The general understanding of PPS reliability and the relationship between the transmission system capability and the safe operation of the NPGS has evolved significantly in recent years. An annex to this document contains a historical synopsis of the events that have brought the industry to its current level of understanding. This synopsis provides background and is intended to assist in gaining a fuller appreciation of the recommendations contained in the body of this recommended practice.

1.2 Scope

This recommended practice addresses activities related to PPS reliability, including design considerations, analytical studies, operational and maintenance considerations, and IAs between an NPGS and its associated Transmission Entities.

1.3 Purpose

This document provides a recommended practice to enhance the PPS reliability with respect to NPGS requirements.