

IEEE Standard for Preferred Power Supply (PPS) for Nuclear Power Generating Stations

Sponsor

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Abstract: The design criteria of the preferred power supply (PPS) and its interfaces with the Class 1E power system, switchyard, transmission system, and alternate ac (AAC) source are described. This standard provides PPS requirements for nuclear power plants and guidance in the areas of AAC power source interfaces with PPS, physical independence of the PPS power and control circuits, and expanded PPS criteria for multi-unit stations.

Keywords: alternate ac source, PPS, preferred power supply, switchyard, transmission system

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Introduction

[This introduction is not a part of IEEE Std 765-1995, IEEE Standard for Preferred Power Supply (PPS) for Nuclear Power Generating Stations.]

This standard was originally prepared to provide detailed design criteria for the preferred power supply (PPS) to ensure a design commensurate with its intended function and to provide sufficient detail to interpret, clarify, and expand on guidance given in GDC-17, GDC-18, and IEEE Std 308-1991.

Title 10, US Code of Federal Regulations, Part 50 (10CFR50), Appendix A, General Design Criteria 17 (GDC-17) for Nuclear Power Plants requires that an offsite electric power system be provided to permit functioning of structures, systems, and components important to safety. In addition, General Design Criteria 18 (GDC-18) provides requirements for inspection and testing of electric power systems.

In 1988, Title 10, Part 50.63 was added to the US Code of Federal Regulations. Part 50.63 requires each lightwater-cooled nuclear power plant to withstand a station blackout for a specific duration and to recover from it. In addition, Part 50.63 defines the requirements for coping with a station blackout by utilizing an alternate ac (AAC) power source. The Nuclear Utility Management and Resource Council (NUMARC)¹ provided additional guidance in NUMARC 87-00-1988, Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Lightwater Reactors. Since NUMARC 87-00 (Revision 1 August 1991) is not available for general public distribution, the guidelines contained therein were considered by the working group in this revision. The design requirements of AAC are outside the scope of this standard.

This revision of the standard additionally provides guidance in the following areas:

- a) AAC power source definition and allowable interfaces with PPS
- b) Design criteria related to the physical independence of the PPS power and control circuits
- c) Expanded PPS criteria for multi-unit stations

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