

IEEE Guide for the Functional Specification of Fixed-Series Capacitor Banks for Transmission System Applications

IEEE Power and Energy Society

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IEEE Guide for the Functional Specification of Fixed-Series Capacitor Banks for Transmission System Applications

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**Transmission and Distribution Committee
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IEEE Power and Energy Society**

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Abstract: General guidelines toward the preparations of a functional specification of transmission fixed-series capacitor (FSC) banks using overvoltage protection based on three technologies are provided. The three technologies are:

- metal oxide varistors
- metal oxide varistors with a forced-triggered bypass gaps, and thyristor protected series capacitors
- thyristor protected series capacitor

This guide does not apply comprehensively to thyristor-controlled series capacitors.

Keywords: bypass gap, capacitor bank, capacitor segment, discharge reactor, IEEE 1726™, metal-oxide varistor, protective level, reactive compensation, series capacitor, series compensation, subsynchronous resonance risk (SSR), trigger circuit, triggered gap, varistor

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This document is dedicated to memory of Stan Miske, our friend and colleague.

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Introduction

This introduction is not part of IEEE Std 1726™-2013, IEEE Guide for the Functional Specification of Fixed-Series Capacitor Banks for Transmission System Applications.

The purpose of this guide is to provide general guidelines toward the preparation of a functional specification of transmission fixed-series capacitor banks (FSC) using overvoltage protection based on three technologies: metal oxide varistors, metal oxide varistors with a forced bypass gap, and thyristor valve bypass.

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1. Overview

1.1 Scope

This guide provides general guidelines toward the preparations of a functional specification of transmission fixed-series capacitor (FSC) banks using overvoltage protection based on three technologies:

- metal oxide varistors
- metal oxide varistors with a forced-triggered bypass gaps
- thyristor valve bypass

The commercial aspects of the specification for a particular project are outside the scope of this guide.

This guide does not apply comprehensively to thyristor-controlled series capacitors. A more complete reference is IEEE Std 1534™-2002.¹ The standard for fixed-series capacitors is IEEE Std 824™-2004.

¹ Information on references can be found in Clause 2.