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IEEE Standard Specifications for Maintenance and Test of Distributed Control Systems in Thermal Power Stations: Operation Service and Management

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IEEE Standard Specifications for Maintenance and Test of Distributed Control Systems in Thermal Power Stations: Operation Service and Management

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Corporate Advisory Group
of the
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Abstract: The basic principles, items, methods, performance indicators, and acceptance requirements for the maintenance and testing of the distributed control systems (DCSs) of thermal power plants are specified. This standard is mainly applicable to the maintenance and testing of DCSs of conventional thermal power plants in commercial operation.

Keywords: DCS, distributed control system, fault handling, I&C, IEEE 1865.2™, instrument and control, maintenance, operation service repair, scheduled maintenance, test, technical management, thermal power plant

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Introduction

This introduction is not part of IEEE Std 1865.2™-2019, IEEE Standard Specifications for Maintenance and Test of Distributed Control Systems in Thermal Power Stations: Operation Service and Management.

Distributed control systems (DCSs) are in wide use today for monitoring and control of power generating units and their auxiliary systems. However, there are several factors—for example, quality of DCSs, the technical and managerial problems or potential risks involving design and configuration, factory acceptance test, installation and commissioning, operation, maintenance, and test process of DCSs—that may directly or indirectly affect the safe, reliable, and economical operation of power generating units.

The safe, reliable, and economical operation of the DCS is based on proper design and configuration, quality of installation and commissioning, and supported by effective maintenance and technical management. To assure long-term safe, stable, and reliable operation of DCS, it is necessary to exercise effective management and control throughout design and configuration, maintenance, test, and routine service and to exercise comprehensive management of safety related external equipment, and their storage and operating environment and conditions.

Therefore, this standard is developed based on the summarization of experiences and expertise and lessons learned from the operational maintenance, repair, test, troubleshooting, and technical management to serve as an international technical and management standard.

This standard specifies the basic principles of repair and test, test performance indicators, and technical requirements for repair acceptance of DCSs. It mainly covers:

— Environment of DCS

— Operation and test of DCS

— Maintenance of DCS

— Technical management of DCS

— Technical requirements and technical assessment of DCS

This standard specifies the basic items, methods, and technical requirements of scheduled maintenance.

Clause 6, about scheduled maintenance, describes the basic items, methods, and technical requirements of periodic maintenance. Subclause 5.3, covering emergency handling and management of faults, describes the development procedure and structure of emergency plans, general requirements and basic principles to be followed for emergency handling of faults, and handling procedures in case of faults. Clause 7 and Clause 8, about management requirements, cover the technical requirements for repair and operation management, software/hardware and upgrade management, storage, management of spare parts, and software/hardware reliability management of control systems.

Contents

IEEE Standard Specifications for Maintenance and Test of Distributed Control Systems in Thermal Power Stations: Operation Service and Management

1. Overview

1.1 Scope

This standard specifies mechanisms and procedures for the operation service and management of distributed control systems (DCSs) in thermal power stations in commercial operation, enabling stable and reliable operation of DCSs.

Reference may be made to this standard for the operation and maintenance of DCSs in other types of power plants.

1.2 Purpose

This standard provides the items, methods, and technical requirements of operation service, fault handling, and technical management of DCS during the operation of power plants based on the engineering philosophy, methods, procedures, and field experiences of DCSs of varying brands in a number of power plants which have been already verified, aiming at offering guidance for developing operation, maintenance, and technical management manuals for DCS in power plants.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).[1,2]

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that).

[1]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.
[2]The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.