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IEEE Guide for the Installation of Vertical Generators and Generator/Motors for Hydroelectric Applications

IEEE Power & Energy Society

Sponsored by the
Energy Development and Power Generation Committee

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Abstract: The procedures for installation described in this guide apply to all types of synchronous generators and generator/motors rated 5 MVA and above to be coupled to hydraulic turbines or hydraulic pump/turbines having vertical shafts.
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Introduction

This introduction is not part of IEEE Std 1095-2012, IEEE Guide for the Installation of Vertical Generators and Generator/Motors for Hydroelectric Applications.

Large hydraulic turbine-driven generators are shipped as components and completely assembled and installed at the site. The installation, therefore, becomes a continuation of the manufacturing process, and many of the operations involved are those that are normally performed in the factory on smaller generators. Close tolerances must be maintained in the fit and alignment of the various parts. The use of proper installation procedures is essential to achieve satisfactory operation of the unit. This guide, originally intended for new construction, continued to be useful whenever the generator rotor or turbine is reinstalled in its operating placement, following removal for maintenance or repair.

This guide incorporates much of the information previously found in the National Electrical Manufacturers Association (NEMA) publication MG 5.2, Installation of Vertical Hydraulic-Turbine-Driven Generators and Reversible Generator/Motors for Pumped Storage Installations. MG 5.2 was originally issued in 1972 and revised in 1975 and 1977. NEMA sponsorship was withdrawn and MG 5.2 was rescinded in September, 1982.

The Hydroelectric Power Subcommittee felt that this guide continued to provide usefulness to the hydropower industry and in 1985 decided to undertake the maintenance of this guide for the benefit of the body of users.

In 2006, the Hydroelectric Power Subcommittee decided to review this guide to address significant technology changes impacting the installation of vertical generators and generator motors for hydroelectric applications that have occurred since this guide was originally prepared. Guidelines contained in this document were harmonized with current international practices.

Contents

IEEE Guide for the Installation of Vertical Generators and Generator/Motors for Hydroelectric Applications

1. Overview

1.1 Scope

The procedures for installation described in this guide apply to all types of synchronous generators and generator/motors rated 5 MVA and above to be coupled to hydraulic turbines or hydraulic pump/turbines having vertical shafts.

1.2 Purpose

Large hydraulic turbine-driven generators are shipped as components and completely assembled and installed at the site. The installation, therefore, becomes a continuation of the manufacturing process, and many of the operations involved are those that are normally performed in the factory on smaller generators. Close tolerances must be maintained in the fit and alignment of the various parts. The use of proper installation procedures is essential to achieve satisfactory operation of the unit.