

Hydraulic turbines, storage pumps and pump-turbines - Rehabilitation and performance improvement

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Rehabilitation and performance improvement

EESTI STANDARDI EESSÕNA

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**Hydraulic turbines, storage pumps and pump-turbines -
Rehabilitation and performance improvement
(IEC 62256:2008)**

Turbines hydrauliques, pompes
d'accumulation et pompes turbines -
Réhabilitation et amélioration
des performances
(CEI 62256:2008)

Wasserturbinen, Speicherpumpen
und Pumpturbinen -
Modernisierung und Verbesserung
der Leistungseigenschaften
(IEC 62256:2008)

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CENELEC

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Foreword

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60041	NOTE Harmonized as EN 60041:1994 (modified).
IEC 60193	NOTE Harmonized as EN 60193:1999 (not modified).
IEC 60609	NOTE Harmonized in EN 60609 series (not modified).
IEC 60994	NOTE Harmonized as EN 60994:1992 (not modified).

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INTRODUCTION

Hydro plant owners make significant investments annually in rehabilitating plant equipment (turbines, generators, transformers, penstocks, gates etc.) and structures in order to improve the level of service to their customers and to optimize their revenue. In the absence of guidelines, owners may be spending needlessly, or may be taking unnecessary risks and thereby achieving results that are less than optimal. This guide is intended to be a tool in the optimisation and decision process.

IEC TC 4 wishes to thank IEA for providing its document “Guidelines on Methodology for Hydroelectric Francis Turbine Upgrading by Runner Replacement” as a starting point for the writing of this document. IEC TC 4 appreciates this contribution and acknowledges that the IEA document provided a good foundation upon which to build this IEC document.

HYDRAULIC TURBINES, STORAGE PUMPS AND PUMP-TURBINES – REHABILITATION AND PERFORMANCE IMPROVEMENT

1 Scope and object

The scope of this International Standard covers turbines, storage pumps and pump-turbines of all sizes and of the following types:

- Francis;
- Kaplan;
- propeller;
- Pelton (turbines only);
- Bulb.

Wherever turbines or turbine components are referred to in the text of this guide, they shall be interpreted also to mean the comparable units or components of storage pumps or pump-turbines as the case requires.

The Guide also identifies without detailed discussion, other powerhouse equipment that could affect or be affected by a turbine, storage pump, or pump-turbine rehabilitation.

The object of this guide is to assist in identifying, evaluating and executing rehabilitation and performance improvement projects for hydraulic turbines, storage pumps and pump-turbines. This guide can be used by owners, consultants, and suppliers to define:

- needs and economics for rehabilitation and performance improvement;
- scope of work;
- specifications;
- evaluation of results.

The Guide is intended to be:

- an aid in the decision process;
- an extensive source of information on rehabilitation;
- an identification of the key milestones in the rehabilitation process;
- an identification of the points that should be addressed in the decision processes.

The Guide is not intended to be a detailed engineering manual nor a maintenance guide.

2 Nomenclature

For the purpose of this document, the term “rehabilitation” is defined as some combination of:

- restoration of equipment capacity and/or equipment efficiency to near “as-new” levels;