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STN	**Hydraulické stroje. Návod na riešenie hydroabrazívnej erózie v Kaplanových, Francisových a Peltonových turbínach.**	**STN EN 62364** 08 5010

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Obsahuje: EN 62364:2013, IEC 62364:2013

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NORME EUROPÉENNE

EN 62364

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Deutsche Fassung

Wasserturbinen - Leitfaden für den Umgang mit hydroabrasiver Erosion in Kaplan-, Francis- und Pelton-Turbinen

(IEC 62364:2013)

Hydraulic machines -
Guide for dealing with hydro-abrasive erosion in Kaplan, Francis, and Pelton turbines
(IEC 62364:2013)

Machines hydrauliques -
Guide relatif au traitement de l'érosion hydro-abrasive des turbines Kaplan, Francis et Pelton
(CEI 62364:2013)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique

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Vorwort

Der Text des Dokuments 4/279/FDIS, zukünftige 1. Ausgabe der IEC 62364, erarbeitet vom IEC TC 4 "Hydraulic turbines", wurde zur parallelen IEC-CENELEC-Abstimmung vorgelegt und von CENELEC als EN 62364:2013 angenommen.

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colour inside

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CONTENTS

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HYDRAULIC MACHINES – GUIDE FOR DEALING WITH HYDRO-ABRASIVE EROSION IN KAPLAN, FRANCIS, AND PELTON TURBINES

FOREWORD

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The text of this standard is based on the following documents:

FDIS	Report on voting
4/279/FDIS	4/283/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

Many owners of hydroelectric plants contend with the sometimes very aggressive deterioration of their machines due to particle abrasion. Such owners must find the means to communicate to potential suppliers of machines for their sites, their desire to have the particular attention of the designers at the turbine design phase, directed to the minimization of the severity and effects of particle abrasion.

Limited consensus and very little quantitative data exists on the steps which the designer could and should take to extend the useful life before major overhaul of the turbine components when they are operated under severe particle abrasion service. This has led some owners to write into their specifications, conditions which cannot be met with known methods and materials.

HYDRAULIC MACHINES – GUIDE FOR DEALING WITH HYDRO-ABRASIVE EROSION IN KAPLAN, FRANCIS, AND PELTON TURBINES

1 Scope

This Guide serves to:

a) present data on particle abrasion rates on several combinations of water quality, operating conditions, component materials, and component properties collected from a variety of hydro sites;

b) develop guidelines for the methods of minimizing particle abrasion by modifications to hydraulic design for clean water. These guidelines do not include details such as hydraulic profile shapes which should be determined by the hydraulic design experts for a given site;

c) develop guidelines based on “experience data” concerning the relative resistance of materials faced with particle abrasion problems;

d) develop guidelines concerning the maintainability of abrasion resistant materials and hard facing coatings;

e) develop guidelines on a recommended approach, which owners could and should take to ensure that specifications communicate the need for particular attention to this aspect of hydraulic design at their sites without establishing criteria which cannot be satisfied because the means are beyond the control of the manufacturers;

f) develop guidelines concerning operation mode of the hydro turbines in water with particle materials to increase the operation life;

It is assumed in this Guide that the water is not chemically aggressive. Since chemical aggressiveness is dependent upon so many possible chemical compositions, and the materials of the machine, it is beyond the scope of this Guide to address these issues.

It is assumed in this Guide that cavitation is not present in the turbine. Cavitation and abrasion may reinforce each other so that the resulting erosion is larger than the sum of cavitation erosion plus abrasion erosion. The quantitative relationship of the resulting abrasion is not known and it is beyond the scope of this guide to assess it, except to recommend that special efforts be made in the turbine design phase to minimize cavitation.

Large solids (e.g. stones, wood, ice, metal objects, etc.) traveling with the water may impact turbine components and produce damage. This damage may in turn increase the flow turbulence thereby accelerating wear by both cavitation and abrasion. Abrasion resistant coatings can also be damaged locally by impact of large solids. It is beyond the scope of this Guide to address these issues.

This guide focuses mainly on hydroelectric powerplant equipment. Certain portions may also be applicable to other hydraulic machines.