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AMERICAN NATIONAL STANDARD

Guide for the Measurement and Evaluation of Vibration of Machine Shafts on Shipboard Machinery

ANSI S2.29-2003

Accredited Standards Committee S2, Mechanical Vibration and Shock

Standards Secretariat
Acoustical Society of America
35 Pinelawn Road, Suite 114E
Melville, New York 11747-3177

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**Guide for the Measurement and Evaluation
of Vibration of Machine Shafts on
Shipboard Machinery**

**Secretariat
Acoustical Society of America**

**Approved 17 December 2003
American National Standards Institute, Inc.**

Abstract

This standard contains procedures for the measurement and evaluation of the mechanical vibration of non-reciprocating machines, as measured on rotating shafts. It contains criteria for evaluating new machines and for vibration monitoring. This American National Standard is related to the various parts of the ISO 7919 series that provides guidelines for the evaluation of different types of machines. The type of machinery covered in this part is shipboard machinery. This is a new ANSI standard, and there is, at present, no International Standards Organization version of this standard.

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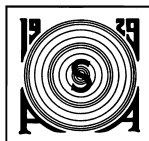
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Foreword

[This Foreword is for information only, and is not a part of the American National Standard ANSI S2.29 - 2003 Guide for the Measurement and Evaluation of Vibration of Machine Shafts on Shipboard Machinery].

This standard comprises a part of a group of definitions, standards, and specifications for use in mechanical vibration and shock. It has been developed using the American National Standards Institute (ANSI) Accredited Standards Committee Procedure. The Acoustical Society of America provides the Secretariat for Accredited Standards Committee S2, Mechanical Vibration and Shock.

Accredited Standards Committee S2, Mechanical Vibration and Shock, under whose jurisdiction this standard was developed, has the following scope:

Standards, specifications, methods of measurement and test terminology in the fields of mechanical vibration and shock and condition monitoring and diagnostics of machines, but excluding those aspects which pertain to biological safety, tolerance, and comfort.

This standard is not comparable to any existing ISO Standard.

At the time this Standard was submitted to Accredited Standards Committee S2, Mechanical Vibration and Shock for approval, the membership was as follows:

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Individual Experts of Accredited Standards Committee S2, Mechanical Vibration and Shock,

P. K. Baade L. A. Herstein

Working Group S2/WG 10.2, Operational Monitoring and Condition Evaluation, which assisted Accredited Standards Committee S2, Mechanical Vibration and Shock, in the development of this standard, had the following membership.

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Suggestions for improvements of this standard will be welcomed. They should be sent to Accredited Standards Committee S2, Mechanical Vibration and Shock, in care of the Standards Secretariat of the Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177.

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American National Standard

Guide for the Measurement and Evaluation of Vibration of Machine Shafts on Shipboard Machinery

0 Introduction

A general description of the principles which are applicable for the measurement and evaluation of shaft vibration of non-reciprocating machines is given in ANSI S2.13-1996, Part 1 (Reference [1]). The related ISO 7919 series deals with the special features required for measuring and evaluating shaft vibrations on different specific types of machinery. This American National Standard, S2.29-2003, covers shipboard machinery and there is, at present, no International Standards Organization version of this Standard. Evaluation criteria, based on previous experience, are presented to be used as guidelines for assessing the vibratory conditions of such machines.

The evaluation of shipboard machines is usually primarily based on the vibration of non-rotating parts, which is addressed in ANSI S2.28-2003 (References [2] and [3]). For particular machines, however, it may be based on shaft vibration as well.

Comments and suggestions related to this standard are encouraged. They should be sent to the Acoustical Society of America (ASA), to be referred to the Accredited Standards Committee S2, Mechanical Vibration and Shock.

NOTE - Address comments to: ASA Standards Secretariat, 35 Pinelawn Road, Suite 114E, Melville, N.Y. 11747-3177

1 Scope, purpose, and applications

1.1 Scope

This American National Standard gives guidelines for applying shaft vibration evaluation criteria, under normal operating conditions, measured at or close to the bearings of some types of non-reciprocating shipboard machinery. These guidelines are presented in terms of both steady vibration amplitudes and changes in amplitudes which may occur in these steady values.

1.2 Purpose

The purpose of this standard is to provide specific guidance for assessing the severity of vibrations measured on rotating shafts of large shipboard machines with fluid film bearings, whenever such measurements are required, so as to insure smooth operation from the standpoint of mechanical suitability.

1.3 Applications

This part applies to large shipboard machines with oil film bearings, such as main propulsion turbines and gears, and turbo-generators. It does not apply to machines with rolling element bearings. Machinery specifications should state when the measurement of relative shaft vibration is required. These guidelines apply to acceptance tests for new machinery, and in-situ testing for monitoring purposes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard, S2.29-2003. At the time of publication, the editions indicated were valid. All standards are subject to revision, and agreements based on this Standard should reference the most recent editions of these standards. Copies of the most recent versions can be obtained from the Acoustical Society of America.

[1] ANSI S2.13-1996/Part 1 (R 2001). *American National Standard Mechanical Vibration of Non-Reciprocating Machines - Measurements on Rotating Shafts and Evaluation - Part 1: General Guidelines.*