AS ISO 13381.1:2014
ISO 13381-1:2004

AS ISO 13381.1:2014

Australian Standard®

Condition monitoring and diagnostics of machines—Prognostics

Part 1: General guidelines

This Australian Standard® was prepared by Committee ME-087, Machine Condition Monitoring. It was approved on behalf of the Council of Standards Australia on 11 March 2014. This Standard was published on 7 April 2014.

The following are represented on Committee ME-087:

- Paste list of committee members here
- Asset Institute
- Australasian Railway Association
- Australian Industry Group
- Australian Institute for Non-Destructive Testing
- Australian Professional Thermography Association
- Bureau of Steel Manufacturers of Australia
- Crane Industry Council of Australia
- Engineers Australia
- Institute of Electrical Inspectors
- International Council for Machinery Lubrication
- Queensland University of Technology

This Standard was issued in draft form for comment as DR AS ISO 13381.1.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Part 1: General guidelines

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-087, Machine Condition Monitoring.

The objective of this Standard is to provide guidance for the development of prognosis processes.

This Standard is identical with, and has been reproduced from ISO 13381-1:2004, *Condition monitoring and diagnostics of machines, Prognostics*, Part 1: *General guidelines.*

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this International Standard' should read 'this Australian Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
ISO		AS ISO	
17359	Condition monitoring and diagnostics of machines—General guidelines	17359	Condition monitoring and diagnostics of machines—General guidelines

Only normative references that have been adopted as Australian or Australian/New Zealand Standard have been listed.

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

CONTENTS

INTRODUCTION

The complete process of machine condition monitoring consists of five distinct phases, as follows:

— detection of problems (deviations from normal conditions);

— diagnosis of the faults and their causes;

— prognosis of future fault progression;

— recommendation of actions;

— post-mortems.

As far as the prognosis of machine health is concerned (which demands prophecies of future machine integrity and deterioration), there can be no exactitude in the process requiring statistical or testimonial approaches to be adopted. Standardization in prognosis of machine health therefore embodies guidelines, approaches and concepts rather than procedures or standard methodologies.

Prognosis of future fault progressions requires foreknowledge of the probable failure modes, future duties to which the machine will/might be subjected, and a thorough understanding of the relationships between failure modes and operating conditions. This can demand the collection of previous duty and cumulative duty parameters, along with condition and performance parameters, prior to extrapolations, projections and forecasts.

Also, there are a growing number of models for damage initiation and damage progression. Prognosis processes need to accommodate these and future analytical damage models.

As computing power increases and multiple parameter analysis becomes a reality, the ability to predict the initiation of a failure mode is not inconceivable if the initiation criteria, expressed as a set of parameter values for a given mode, are known as well as their future behaviour for a given set of conditions.

AUSTRALIAN STANDARD

Condition monitoring and diagnostics of machines—Prognostics

Part 1:
General guidelines

1 Scope

This International Standard provides guidance for the development of prognosis processes. It is intended

— to allow the users and manufacturers of condition monitoring and diagnostics systems to share common concepts in the fields of machinery fault prognosis,

— to enable users to determine the necessary data, characteristics and behaviour necessary for accurate prognosis,

— to outline an appropriate approach to prognosis development, and

— to introduce prognoses concepts in order to facilitate the development of future systems and training.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13372, *Condition monitoring and diagnostics of machines — Vocabulary*

ISO 17359, *Condition monitoring and diagnostics of machines — General guidelines*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13372 and the following apply.

3.1
prognosis
estimation of time to failure and risk for one or more existing and future failure modes

3.2
confidence level
figure of merit that indicates the degree of certainty that the diagnosis/prognosis is correct

NOTE It is expressed as a percentage.