
**Condition monitoring and diagnostics
of machines — Data processing,
communication and presentation —**

**Part 1:
General guidelines**

*Surveillance et diagnostic d'état des machines — Traitement, échange
et présentation des données —*

Partie 1: Lignes directrices générales



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Data processing	1
2.1 Overview	1
2.2 Data-processing blocks	1
2.3 Conceptual information schema guidelines	4
3 Data communication formats and methods for exchanging information	6
3.1 Communication methodologies	6
3.2 Selection guidelines for communication methodologies	7
4 Formats for presenting and displaying data	8
4.1 General	8
4.2 Determination of work flow procedures	8
4.3 General information display architecture	9
5 Responsible personnel	14
5.1 Introduction	14
5.2 Operators	14
5.3 Operations engineer	14
5.4 Reliability analyst	14
5.5 Management	14
Annex A (informative) Machinery Information Management Open Systems Alliance (MIMOSA) specifications	15
Bibliography	16

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13374-1 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration and shock*, Subcommittee SC 5, *Condition monitoring and diagnostics of machines*.

ISO 13374 consists of the following parts, under the general title *Condition monitoring and diagnostics of machines — Data processing, communication and presentation*:

- *Part 1: General guidelines*
- *Part 2: Data-processing requirements*
- *Part 3: Communication requirements*
- *Part 4: Presentation requirements*

Introduction

The various computer software programs written for condition monitoring and diagnostics of machines that are currently in use cannot easily exchange data or operate in a plug-and-play fashion without an extensive integration effort. This makes it difficult to integrate systems and provide a unified view of the condition of machinery to users. The intent of ISO 13374 is to provide the basic requirements for open software specifications which will allow machine condition monitoring data and information to be processed, communicated and displayed by various software packages without platform-specific or hardware-specific protocols.

Extensible Markup Language (XML) is a project of the World Wide Web Consortium (W3C), and the development of the specification is being supervised by their XML Working Group. XML is a public format written in the Standard Generalized Markup Language (SGML) (see ISO 8879^[1] for details) for defining descriptions of the structures of different types of electronic documents. The version 1.0 specification was accepted by the W3C as a Recommendation in 1998. A W3C Recommendation indicates that a specification is stable, contributes to Web interoperability, and has been reviewed by the W3C membership, who are in favour of supporting its adoption by academic, industry and research communities. It is designed to improve the functionality of the Web by providing more flexible and adaptable information identification.

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Condition monitoring and diagnostics of machines — Data processing, communication and presentation —

Part 1: General guidelines

1 Scope

This part of ISO 13374 establishes general guidelines for software specifications related to data processing, communication, and presentation of machine condition monitoring and diagnostic information.

NOTE Later parts of ISO 13374 (under preparation) will address specific software specification requirements for data processing, communication and presentation.

2 Data processing

2.1 Overview

Relevant data processing and analysis procedures are required to interpret the data received from condition monitoring activities. A synergistic combination of technologies should establish the cause and severity of possible faults and provide the justification for operations and maintenance actions in a pro-active manner.

A data processing and information flow of the type shown in Figure 1 is recommended either on a manual or automatic basis, in order to implement condition monitoring successfully. The data flow begins at the top, where monitoring configuration data are specified for the various sensors monitoring the equipment, and finally results in actions to be taken by maintenance and operations personnel. As the information flow progresses from data acquisition to advisory generation, data from the earlier processing blocks need to be transferred to the next processing block and additional information acquired from or sent to external systems. Similarly, as the data evolve into information, both standard technical displays and simpler graphical presentation formats are needed. The flow progresses from data acquisition to complex prognostic tasks, ending in the issuance of advisories and recommended actions (one of which may be a modification of the monitoring process itself).

2.2 Data-processing blocks

2.2.1 Machine condition assessment processing blocks

Machine condition assessment can be broken into six distinct, layered processing blocks. The first three blocks are technology-specific, requiring signal processing and data analysis functions targeted to a particular technology. The following are some of the most commonly used technologies in condition monitoring and diagnostics of machines:

- shaft displacement monitoring;
- bearing vibration monitoring;
- tribology-based monitoring;