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Condition monitoring and diagnostics of machines — Requirements for training and certification of personnel —

Part 2:
Vibration condition monitoring and diagnostics

Surveillance et diagnostic d'état des machines — Exigences relatives à la formation et à la certification du personnel —

Partie 2: Surveillance des vibrations et diagnostic d'état des machines

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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 18436-2 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration and shock*, Subcommittee SC 5, *Condition monitoring and diagnostics of machines*.

ISO 18436 consists of the following parts, under the general title *Condition monitoring and diagnostics of machines — Requirements for training and certification of personnel*:

- *Part 1: Requirements for certifying bodies and the certification process*
- *Part 2: Vibration condition monitoring and diagnostics*

The following parts are under preparation:

- *Part 3: Requirements for training bodies*
- *Part 4: Lubrication management and analysis*
- *Part 5: Thermography*
- *Part 6: Diagnostics and prognostics*
- *Part 7: Condition monitoring specialists*

Introduction

Vibration analysis using measurements to monitor condition and diagnose faults in machinery has become a key activity in predictive maintenance programmes for most industries. Other non-intrusive technologies including infrared thermography, acoustic emission, lubricant analysis and motor current analysis, are used as complementary condition analysis tools. Those in the manufacturing industry who have diligently and consistently applied these techniques have experienced a return on investment far exceeding their expectations. However, the effectiveness of these programmes depends on the capabilities of individuals who perform the measurements and analyse the data.

This part of ISO 18436 defines the requirements against which personnel in the non-intrusive machine condition monitoring and diagnostics technologies associated with vibration analysis are to be certified and the methods of testing such personnel. Conformity assessment for certification in vibration analysis will be performed by a body accredited to the requirements of ISO 18436-3.

Condition monitoring and diagnostics of machines — Requirements for training and certification of personnel —

Part 2:
Vibration condition monitoring and diagnostics

1 Scope

This part of ISO 18436 specifies the general requirements for vibration analysis personnel who perform machinery condition monitoring and diagnostics of machines. Certification to this standard will provide recognition of the qualifications and competence of individuals to perform machinery vibration measurements and analysis using portable and permanently installed sensors and equipment.

This part of ISO 18436 covers a four-category certification programme that is based on the technical areas discussed herein.

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 1925, *Mechanical vibration — Balancing — Vocabulary*

ISO 1940 (all parts), *Mechanical vibration — Balance quality requirements of rigid rotors*

ISO 2017-1, *Mechanical vibration and shock — Resilient mounting systems — Part 1: Application of source and receiver isolation*

ISO 2041, *Vibration and shock — Vocabulary*

ISO 2954, *Vibration of rotating and reciprocating machinery — Requirements for instruments for measuring vibration severity*

ISO 5348, *Mechanical vibration and shock — Mechanical mounting of accelerometers*

ISO 7919 (all parts), *Mechanical vibration of non-reciprocating machines — Measurements on rotating shafts and evaluation criteria*

ISO 8528-9, *Reciprocating internal combustion engine driven alternating current generating sets — Part 9: Measurement and evaluation of mechanical vibrations*

ISO 8569, *Mechanical vibration and shock — Measurement and evaluation of shock and vibration effects on sensitive equipment in buildings*

ISO 10816 (all parts), *Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts*

ISO 11342:1998, *Mechanical vibration — Methods and criteria for the mechanical balancing of flexible rotors*

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

ISO 13373-1, *Condition monitoring and diagnostics of machines — Vibration condition monitoring — Part 1: General procedures*

ISO 13379, *Condition monitoring and diagnostics of machines — General guidelines on data interpretation and diagnostics techniques*

ISO 14694, *Industrial fans — Specifications for balance quality and vibration levels*

ISO 14695, *Industrial fans — Method of measurement of fan vibration*

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

ISO 18436-1, *Condition monitoring and diagnostics of machines — Requirements for training and certification of personnel — Part 1: Requirements for certifying bodies and the certification process*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2041, ISO 13372, ISO 18436-1 and the following apply.

3.1
analysis
process of using signal processing techniques and machine knowledge to evaluate machine faults and condition

3.2
route
organized series of machine measurement locations listed by machine train, measure or plant geography

3.3
trainee
person who is training to become qualified for certification

3.4
vibration diagnostics
interpretation of vibration data to determine machine faults

3.5
vibration monitoring
process of measurement, trending, and interpretation of vibration data

4 Classification of personnel for vibration condition monitoring and diagnostics of machines

4.1 General

Individuals recognized or certified in accordance with this part of ISO 18436 shall be classified in one of several categories depending upon their qualifications. They shall have demonstrated competence in the concepts of machinery vibration condition monitoring and diagnostics of machines for their classification category as indicated in Annex A and in accordance with the standards listed in Annex B.