ISO STANDARDS FOR CONDITION MONITORING

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Abstract: This paper introduces delegates to the content and requirements of the new, and under development, range of ISO standards relating to condition monitoring. The paper describes the outlined processes for condition monitoring system design and implementation as well as new concepts in the fields of diagnostics and prognostics. The processes outlined also have direct FMEA links to RCM programs and can be used to implement CM programs directly linked to RCM analyses.

This paper also outlines developments in the fields of Training and Accreditation including new and upcoming standards.

Several of the new standards released and under development discussed in this paper are:

ISO 17359, Condition monitoring and diagnostics of machines – General guidelines

ISO 13373, Mechanical vibration and shock - Vibration condition monitoring of machines

ISO 13379, Data interpretation and diagnostic techniques which use information and data related to the condition of a machine.

ISO 13381, Condition monitoring and diagnostics of machines – Prognostics

ISO 18436 Part II, Accreditation of organizations and training and certification of personnel - Part II - General requirements for training and certification – Vibration Analysis

ISO 18436 Sub Parts under development for Oil Analysis and Thermal Imaging

Key Words: RCM, Condition Monitoring, Prognostics, Vibration Analysis, Thermal Imaging, Diagnostics, ISO.

1 INDUSTRY BACKGROUND

Prior to 2002 litigation based on negligence in the condition monitoring business was not largely undertaken due to the lack of standardised procedures, processes, methodologies and associated training and certification requirements and systems available in the public domain that could be used as a basis for argument. This was also compounded by a lack of knowledge within the customer base. This lack of documentation has also resulted in customer contracts with no clearly stated and/or enforceable performance criteria that could be used to form the basis for such litigation.

This situation changed in 2002 with the release of the first of many ISO Standards covering the subject of condition monitoring the most important of which are ISO 17359 Condition monitoring and diagnostics of machines – General guidelines and ISO 18436 Condition monitoring and diagnostics of machines – Accreditation of organisations and training and certification of personnel.

These two documents, and their normative references, outline the processes by which condition monitoring should be performed and also the requirements for training and certification of personnel both of which form a basis for future litigation for negligence given that these documents are now in the public domain as International Standards.

Customers using these documents for the basis of their contracts will also now be able to specify compliance to the ISO processes as mandatory as well as specifying certification standards for personnel supplied. Customers are also becoming highly educated in condition monitoring particularly with the global expansion of such maintenance philosophies as RCM, TPM, Six Sigma and a global drive toward reliability as a focus rather than maintenance cost optimisation hence the requirement for such standards.

2 USE OF STANDARDS

In general the standards being produced can be used in a wide variety of ways including:

- Managing the quality of a delivered service
- Tender or contract compliance conditions
- Evaluation of service providers
- Internal program management
- Risk management
- Insurance management
- Service provider performance evaluation
- Litigation
- Training and education

Given the ease of quoting a standard in a contract document there is a significant risk associated with lack of customer knowledge of condition monitoring principles and techniques. This lack of knowledge coupled with a lack of thorough understanding of the standards requirements may still result in a high risk service provider being selected based on the lowest price basis without regard to risk minimisation. In future far more attention is needed across industry toward Return on Investment (ROI) and risk management approaches to selection and evaluation of service providers to ensure that the service is fit for purpose, with regard to risk of failure, and has the greatest return on investment potential with respect to problem solving rather than just defect detection.

3 GENERAL PROCESS MAP

A general conceptual approach to the overall condition monitoring process is given below in Figure 1 (ISO/CD 13379). An overview of the guideline process from ISO 17359 is shown below in Figure 2.

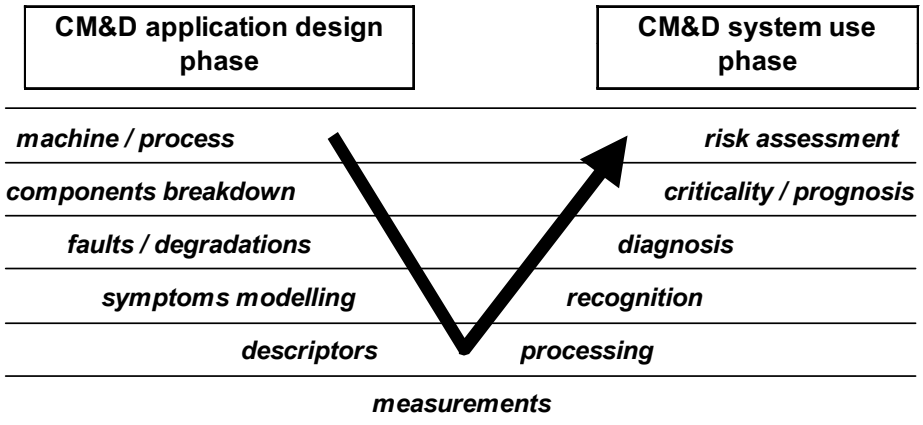

Fig. 1. Conceptual Approach.