

Title	Maintain machinery database and identify incipient failure of machinery from vibration analysis data		
Level	5	Credits	12

Purpose	People credited with this unit standard are able to: add machinery to database and set the measurement parameters; analyse machinery condition for incipient failure modes using vibration diagnostic techniques; and report on the condition of machinery.
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Classification	Mechanical Engineering > Maintenance and Diagnostics in Mechanical Engineering
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Available grade	Achieved
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Entry information	
Recommended skills and knowledge	Unit 12293, <i>Establish vibration data from machinery using vibration measuring equipment</i> , or demonstrate equivalent knowledge and skills.

Explanatory notes

- References
Health and Safety in Employment Act 1992.
Accident Compensation Corporation and Department of Labour. *Metal Industry Guidelines for Safe Work*. Wellington: ACC, 2007. Available from <http://www.acc.co.nz>.
- Definitions
Abnormal measurement – a departure in the frequency and/or amplitude characteristics from the normal fault characteristic.
Database – manuscript or electronic data collection systems where records may contain fields including date, machine identification, machine location, measurement, measurement points and values, process parameters, warning and alarm levels.
Machinery – includes processing and manufacturing plant, propulsion systems, power generating machines that contain rotating elements - (motors, pumps, and fans) - and incorporating coupled, gearbox, and belt driven transmission types.
Operational limitations – machinery operating conditions for plant requirements which may in some instances supersede manufacturer's specifications and/or worksite procedures.
Safety guidelines – guidelines for the safe operation of machinery and tools, such as those listed in the references, as well as guidelines for specific machines in workshops.

Vibration measuring equipment – a range of instruments that measure, display, and analyse acceleration and vibration. Technologies include accelerometers and displacement sensors.

Worksite documents – manufacturer's documentation, drawings, maintenance management documentation, and other technical information.

Worksite procedures – operational procedures put in place by the candidate's employer. These include site safety procedures, equipment operating procedures, job procedures, quality assurance processes and procedures, and other procedures for the handling and disposal of materials and waste.

- 3 The following apply to this unit standard:
- a All activities must demonstrate safe working practices.
 - b All activities must be completed independently and reported within agreed timeframes.
 - c Vibration instruments may be used on a stand-alone basis, or in conjunction with a data acquisition system. Assessment across all outcomes requires the candidate to use measuring equipment defined above to capture and analyse vibration data.

Outcomes and evidence requirements

Outcome 1

Add machinery to database and set the measurement parameters.

Evidence requirements

- 1.1 Operational restrictions of the machinery to be tested are described in accordance with worksite procedures, worksite documents, and operational limitations.
- 1.2 Machinery is added to the database in accordance with worksite procedures.
- 1.3 Measuring equipment to be used on machinery added to the database is selected in accordance with worksite procedures, worksite documents, and operational limitations.
- 1.4 Measurement parameters for machinery are established and entered within the database in accordance with worksite procedures, worksite documents, and operational limitations.

Range warning, alarm, measurement points, frequency span, units, transducer selection, range, defect data.

Outcome 2

Analyse machinery condition for incipient failure modes using vibration diagnostic techniques.

Evidence requirements

- 2.1 Hazards are identified when using instrumentation with operating machinery, and safety requirements are complied with, in accordance with worksite procedures and worksite documents.

2.2 Machinery condition is diagnosed and incipient failure modes are detected in accordance with worksite procedures, worksite documents, and operational limitations.

Range faults – out of balance, misalignment, looseness, bearing problems, cavitation, harmonics.

2.3 Warning and alarm values are evaluated and reset in accordance with worksite procedures, worksite documents, and operational limitations.

Outcome 3

Report on the condition of machinery.

Evidence requirements

3.1 Report on machinery condition is completed and recommendations are made in accordance with worksite procedures, worksite documents, and operational limitations.

3.2 Measurements identified as abnormal and outside own levels of experience to analyse are reported in accordance with worksite procedures.

Planned review date	31 December 2016
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 September 1997	31 December 2011
Revision	2	18 September 2001	31 December 2011
Rollover and Revision	3	25 July 2006	31 December 2011
Rollover	4	20 June 2008	31 December 2014
Review	5	17 November 2011	N/A

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz on qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.