Title	**Demonstrate and apply knowledge of project management in mechanical engineering**		
Level	**6**	**Credits**	**15**

Purpose	This unit standard is intended primarily for use in diploma programmes in mechanical engineering. It covers knowledge of project management principles, tools, and techniques, and their application to a real or simulated project. People credited with this unit standard are able to demonstrate knowledge of project management in mechanical engineering, and apply that knowledge to a project of moderate size.

Classification	Mechanical Engineering > Applied Principles of Mechanical Engineering

Available grade	Achieved

Explanatory notes

1 References
ISO 10006:2003. *Quality management systems – Guidelines for quality management in projects*.
Association for Project Management. *APM Body of Knowledge*. 6th edition. High Wycombe: APM Publishing Ltd, 2012. ISBN 978-1-903494-41-7 or 978-1-903494-40-0.
Project Management Institute, Inc. *A Guide to the Project Management Body of Knowledge (PMBOK Guide*). 5th edition. Newton Square: Project Management Institute, Inc., 2004. ISBN-13: 978193558967.
Health and Safety at Work Act 2015 and supporting Regulations.

2 Definitions
Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.
Critical path refers to the sequence of scheduled project activities which determine the duration of the project.
Critical Path Analysis *(CPA)* or the *Critical Path* Method *(CPM)* is a project management tool that identifies tasks which must be completed on time for the whole project to be completed on time.
Gantt chart is a project management tool showing graphically the duration and progress of project tasks against time.
Mechanical engineering project is a project, the primary focus of which is the installation and commissioning of mechanical engineering plant or machinery, or the

development of a new product involving mechanical engineering. Other disciplines may also be involved in achieving the project objectives.
Program Evaluation Review Technique (PERT) is a project management tool for analysing the tasks within a project. A PERT chart shows the interdependence of tasks within the project.
Project Management refers to the effective control of resources through a process designed to achieve specific outcomes within time and financial constraints.
Recognised methodology refers to a project management methodology according to one of the guidelines listed under References.
Work Breakdown Structure (WBS) defines and organises a project's work by identifying the major functional outcomes and subdividing those outcomes into smaller systems and sub-deliverables.
Workplace procedures refer to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

3 Range
Evidence presented for assessment against this standard should be based on the methodology of at least one of the references in Explanatory Note 1.

4 Assessment information
Numerous reference texts and training manuals on project management are available and may be used; however, no one textbook or source of information is envisaged. All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of project management in mechanical engineering.

Evidence requirements

1.1 The aims of good project management are explained in accordance with a recognised methodology.

Range reference to effective management of – time, scope, cost, internal resources, external resources including contractors.

1.2 The roles of key personnel in the management of a successful project are discussed in accordance with a recognised methodology.

Range key personnel – senior management; sponsor or budget manager; project manager; stakeholders; team members; suppliers of internal and external services and materials.

1.3 The stages of a successful project are explained with reference to the key activities, critical success factors, and major items of documentation at each stage, in accordance with a recognised methodology.

Range stages – initiation, planning, execution and control, closeout.

1.4 Gantt and PERT charts and the concept of Critical Path are explained in accordance with a recognised methodology.

Outcome 2

Apply knowledge of project management to a mechanical engineering project of moderate size.

Range project of moderate size would typically involve – moderate investment; at least 20 project activities; a definite schedule target; installation and commissioning of plant or machinery, or development of a new product; a project team of at least 5 people;
candidates are expected to use project management software in the preparation of WBS and project schedule;
a supplied range of templates may be used in the preparation of the various documents.

Evidence requirements

2.1 A project charter is prepared in accordance with project requirements and a recognised methodology.

Range charter to contain at least – project objective, project organisation, stake holders, overall scope, constraints, contract tendering requirements, cost estimate, cost/benefit analysis, high level schedule, risks.

2.2 A project plan is prepared in accordance with a recognised methodology.

Range plan to contain at least – scope, WBS, project schedule including Gantt and PERT charts with critical path, contracting schedule, risk plan, resources plan, project budget, quality plan, change management plan, procurement plan.

2.3 Project progress is tracked on the project schedule in accordance with a recognised methodology and the project management software.

2.4 Any introduced change and an unexpected delay are managed in accordance with the project plan.

2.5 A project status report is prepared in accordance with a recognised methodology.

2.6 A project closure document is prepared in accordance with a recognised methodology.

Range closure document must include at least reference to – review of project outcomes against baseline requirements, deviations, ongoing support or maintenance, sign-off.

Planned review date	31 December 2021

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 November 2007	31 December 2016
Rollover	2	19 March 2010	31 December 2021
Review	3	20 October 2016	N/A

Consent and Moderation Requirements (CMR) reference	0013

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 (CMRs). 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 qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.