Title	**Lead a Hazard and Operability (HAZOP) study in the workplace**		
Level	**6**	**Credits**	**10**

Purpose	This unit standard is for people who lead HAZOP studies in the workplace. People credited with this unit standard are able to demonstrate knowledge of the technical requirements for leading a HAZOP study; analyse the preparation requirements for a HAZOP study; and lead a HAZOP study, in the workplace.

Classification	Occupational Health and Safety > Occupational Health and Safety Practice

Available grade	Achieved

Guidance Information

1 Recommended entry unit: Unit 19341, *Demonstrate knowledge of Hazard and Operability (HAZOP) studies in the workplace*.

2 Legislation relevant to this unit standard includes but is not limited to – Health and Safety at Work Act 2015 (HSWA); Health and Safety at Work (Hazardous Substances) Regulations 2017, Hazardous Substances and New Organisms Act 1996 (HSNO Act); Electricity (Safety) Regulations 2010.

3 Definitions
Hazard – a situation that poses a level of threat to life, health, property or environment.
Organisational requirements – instructions to staff on policies and procedures which are documented in memo, electronic or manual format and are available in the workplace.
Risk – the potential that a chosen action or activity (including the choice of inaction) will lead to a loss (an undesirable outcome).

4 This unit standard should only be assessed by a person holding an appropriate tertiary engineering qualification such as chemical, mechanical or electrical engineering or membership of a professional engineering body such as Engineering New Zealand or the Institution of Chemical Engineers (IChemE) or a science degree combined with practical engineering experience.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the technical requirements for leading a HAZOP study in the workplace.

Performance criteria

1.1 Failure modes, common process equipment, and control systems are explained in accordance with organisational requirements.

Range common process equipment and control systems include but are not limited to – heat exchangers (plate, shell, tube), pumps, motors, valves, switches, transmitters, non-return valves, pressure relief devices.

1.2 Acts and regulations which impact upon decisions made during a HAZOP study are outlined in terms of their scope.

Range Acts and regulations include but are not limited to – HSWA, HSNO Act, Electricity (Safety) Regulations.

1.3 Process safeguarding and protection analysis are explained in accordance with organisational requirements.

Range process safeguarding and protection analysis include but are not limited to – control systems, trip systems, penultimate protection equipment integrity, mitigation, instrumented protection functions or safety integrity level reviews, layers of protection.

1.4 The role of the HAZOP leader and the project manager or engineer is outlined in terms of actioning items arising from the HAZOP study.

1.5 Methods of quantitative risk assessment are explained in terms of their application to actioning items arising from the HAZOP study.

Outcome 2

Analyse the preparation requirements for a HAZOP study in the workplace.

Performance criteria

2.1 Information requirements are analysed in accordance with organisational requirements.

Range information requirements include but are not limited to – general arrangement drawings, functional description, cause and effect matrix, process safeguarding, hazardous area classification, material safety data sheets, operating guidelines.

2.2 Venue requirements are analysed in accordance with organisational requirements.

Range venue requirements include but are not limited to – location, dates, documentation equipment, control of disruptions.

2.3 The scope of the review is analysed in accordance with organisational requirements.

Range analysis includes but is not limited to – defining, confirming, prioritising expected review duration and time available to carry out review;
scope includes but is not limited to – number and complexity of nodes, time per node, maturity of design.

2.4 HAZOP study team members are selected, and their roles and responsibilities analysed in accordance with organisational requirements.

Range roles include but are not limited to – leader, design engineer, scribe, specialist, production and maintenance representatives, control engineer, project manager or engineer.

2.5 The terms of reference for the study are analysed with relevant stakeholders.

Range analysis includes but is not limited to – outlining, verifying;
terms of reference include but are not limited to – location, date, attendees, duration, scope, supporting information.

2.6 Situations applicable to a HAZOP study are analysed in terms of types of process to be used.

Range situations include but are not limited to – new projects, modifications, existing plants, incident investigation, mechanical systems, continuous and sequential systems, physical activities, procedures;
evidence is required of three situations where a HAZOP study is an appropriate method and three situations where a HAZOP study is not an appropriate method.

2.7 Legislative requirements that apply to a leader's role in an HAZOP study are analysed.

Outcome 3

Lead a HAZOP study in the workplace.

Performance criteria

3.1 Agenda for a HAZOP review is prepared in accordance with organisational requirements.

Range agenda includes but is not limited to – introduction, process description, scope, site visit, node selection, application of guide-words, risk estimate, overview.

3.2 Meeting documentation requirements are defined in accordance with organisational requirements.

Range documentation requirements include but are not limited to – worksheet, marked up master, final report content.

3.3 Nodes of an appropriate size are identified and marked up in accordance with organisational requirements.

Range nodes include but are not limited to – continuous processes, batch or sequential processes.

3.4 Guide-words are applied to nodes, the outcome documented and any consequences determined in accordance with organisational requirements.

Range guide-words include but are not limited to – identification of causes including the identification of failure modes for equipment and control system, determination of consequences and safeguards, determination of adequacy of safeguards and required actions.

3.5 Any non-ideal situations arising during a HAZOP meeting are dealt with in accordance with organisational requirements.

Range non-ideal situations may include but are not limited to – disagreements between participants, dominant personalities, defensive design engineer, quiet personalities, budget limitations, fatigue, insufficient time, documentation errors.

3.6 Hazard analysis procedures to be used to analyse results of the HAZOP study are outlined in terms of the type of information that will be produced.

Range hazard analysis procedures may include but are not limited to – methods (qualitative, semi-qualitative, quantitative), estimation of consequences for personnel or public safety, financial loss or environmental impact, estimation of likelihood, assessment against criteria, decision options.

3.7 Tools used in hazard analysis procedures are selected in accordance with organisational requirements.

Range tools may include but are not limited to – models, fault tree, event tree, logic gates.

3.8 Decisions arising from the HAZOP study are analysed to determine optimal methods of reducing identified risk by elimination, isolation and minimisation of hazards in accordance with organisational requirements.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 June 2011	N/A
Rollover and Revision	2	22 May 2014	N/A
Rollover and Revision	3	22 August 2019	N/A
Rollover and Revision	4	25 March 2021	N/A

Consent and Moderation Requirements (CMR) reference	0121

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.