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| **Title** | **Demonstrate basic knowledge and ability required to work in an underground operation** | | |
| **Level** | **2** | **Credits** | **6** |

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| **Purpose** | People credited with this unit standard are able to: identify the requirements of the Health and Safety at Work Act 2015 (HSW) and relevant regulations to work in an underground operation; demonstrate knowledge of and examine a self-rescuer; demonstrate knowledge of cap lamps, and check and prepare a cap lamp; demonstrate knowledge of the function of personal protective equipment; describe safety measures for systems that supply energy to machinery and equipment, and demonstrate the safe isolation of energy systems; demonstrate knowledge of personnel security, personnel accounting, navigation, and emergency procedures; describe basic ventilation principles and practices for an underground operation; demonstrate basic knowledge of gases found in underground operations; and demonstrate knowledge of unsupported ground and the purpose of scaling. |

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| **Classification** | Extractive Industries > Underground Extraction |

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| **Available grade** | Achieved |

**Guidance Information**

1 Performance of the outcomes of this unit standard must comply with the following:
Health and Safety at Work Act 2015 (HSW);
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016;
Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016;
Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016;
approved codes of practice issued pursuant to the HSW Act.

2 Any new, amended, or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

3 Definitions
*Company procedures* mean the documented methods for performing work activities and include health and safety, operational, environmental, and quality management requirements. They may refer to legislation, regulations, guidelines, standard operating procedures, manuals, codes of practice, or policy statements.
*Industry best practice* may be documented in management plans, control plans, company procedures, managers' rules, occupational health and safety policy, industry guidelines, codes of practice, manufacturers' instructions, and safe working and/or job procedures (or equivalent).

4 An *underground operation* includes extractive or tunnelling operations.

## Outcomes and performance criteria

### Outcome 1

Identify the requirements of the HSW Act and relevant regulations to work in an underground operation.

Range relevant regulations include but are not limited to – the HSW (Mining Operations and Quarrying Operations) Regulations 2016.

### Performance criteria

1.1 The requirements of the HSW Act, and relevant regulations are identified in terms of their application to a worker in an underground operation.

Range duties of employers (mine operator), duties of employees (workers), accident procedures, approved codes of practice, offences and penalties, High Hazards Unit (HHU) inspectors, regulations, stress in the workplace.

### Outcome 2

Demonstrate knowledge of and examine a self-rescuer.

### Performance criteria

2.1 Name and purpose of each piece of equipment related to the self-rescuer are identified.

2.2 The application of each piece of equipment related to the self-rescuer is described.

2.3 The self-rescuer is examined for readiness in terms of defects, rejection, and replacement.

**Outcome 3**

Demonstrate knowledge of cap lamps, and check and prepare a cap lamp.

**Performance criteria**

3.1 Cap lamp is checked to ensure that it is in working condition.

Range fully charged, bulbs, seals, glass, leaks, switch, cable, glands, battery casing, battery condition.

3.2 Pre-shift checks for cap lamps are described in accordance with company procedures. Company procedures to be followed when a cap lamp is defective are identified and described.

3.3 Preparation for the use of a cap lamp in an underground operation is demonstrated in accordance with company procedures.

3.4 Risks of dismantling a cap lamp are identified in terms of its use in an underground operation.

**Outcome 4**

Demonstrate knowledge of the function of personal protective equipment (PPE).

**Performance criteria**

4.1 Items of PPE are described in terms of their function in an underground operation.

Range includes but is not limited to – clothing, footwear, hearing protection, eye protection, hardhat, gloves, lamp belt, dust protection.

**Outcome 5**

Describe safety measures for systems that supply energy to machinery and equipment, and demonstrate the safe isolation of energy systems, in an underground operation.

**Performance criteria**

5.1 Systems that supply energy to machinery and equipment are described in terms of their use.

Range compressed air, electricity, hydraulic fluid, high-pressure water.

5.2 Safe isolation of energy supplied to machinery and equipment is described and demonstrated in accordance with industry best practice.

Range compressed air, electricity, hydraulic fluid, high-pressure water.

5.3 Flameproof and intrinsically safe equipment are described in terms of their differences.

**Outcome 6**

Demonstrate knowledge of personnel security, personnel accounting, navigation, and emergency procedures in an underground operation.

**Performance criteria**

6.1 Personnel security systems used for ensuring safety in an underground operation are described in accordance with industry best practice and company procedures.

Range contraband, restricted zones, restricted materials.

6.2 Personnel accounting systems used for ensuring safety in an underground operation are described in accordance with industry best practice and company procedures.

Range tag, paper, cap lamp number.

6.3 The use of an underground plan to navigate to safe areas and work areas within an underground operation is demonstrated in accordance with industry best practice and company procedures.

6.4 Emergency procedures for an underground operation are described in accordance with industry best practice and company procedures.

**Outcome 7**

Describe basic ventilation principles and practices for an underground operation.

**Performance criteria**

7.1 The purpose of ventilation is described in terms of the health and safety of workers.

Range includes but is not limited to – dilute and remove dust, dilute and remove unwanted gases, provide cooling, provide oxygen, DPM (diesel particulate matter), recirculation.

7.2 The methods of air distribution are described in terms of achievement of a healthy and safe work environment.

7.3 The purpose and use of VCDs are described in terms of their application in an underground operation.

Range may include but is not limited to – air crossings, stoppings, seals, regulators, doors, main fans, auxiliary fans, air movers, air intake, return airflow.

**Outcome 8**

Demonstrate basic knowledge of gases found in underground operations.

**Performance criteria**

8.1 Normal air is described in terms of its mixture.

8.2 Reduction of oxygen in the atmosphere of an underground operation is described.

8.3 The properties of gases are stated in relation to flammability, relative density, and toxicity to the body.

Range methane, carbon dioxide, carbon monoxide, explosives gases, oxides of nitrogen.

**Outcome 9**

Demonstrate knowledge of unsupported ground and the purpose of scaling.

**Performance criteria**

9.1 Unsupported ground is defined and explained in terms of related risks and procedures.

9.2 The purpose of scaling is described.

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| **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 | 29 August 1996 | 31 December 2017 |
| Revision | 2 | 17 December 1996 | 31 December 2017 |
| Revision | 3 | 18 December 1998 | 31 December 2017 |
| Review | 4 | 25 November 2000 | 31 December 2017 |
| Review | 5 | 24 November 2005 | 31 December 2017 |
| Revision | 6 | 19 May 2006 | 31 December 2017 |
| Rollover and Revision | 7 | 16 July 2010 | 31 December 2019 |
| Review | 8 | 18 June 2015 | N/A |
| Rollover and Revision | 9 | 25 January 2018 | N/A |

| Consent and Moderation Requirements (CMR) reference | 0114 |
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This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

**Comments on this unit standard**

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.